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Assessment of Medication Adherence and Awareness in Hypertensive South Indian Population

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Abstract

Aim- The aim is to assess knowledge and adherence to anti-hypertensive medications in patients diagnosed with hypertension (HTN). **Methodology-** This is an observational study conducted for a period of 6 months at a tertiary care hospital. Patients diagnosed with hypertension and visiting out-patient department were included. Subjects after giving their consent were asked to fill questionnaire. Patient education was given to all enrolled subjects in study at the session end. Obtained data was entered and analyzed using SPSS software version 26. **Results-** A total of 300 subjects diagnosed with hypertension were included, out of which 59% were male and 41% were female. 58% of subjects have no knowledge on complications associated with uncontrolled blood pressure, but 42% were aware of it. 81% of subjects were adherent to their anti-HTN medications out of which 77% were from rural and 85% from urban region. Males were found to be more adherent to their daily anti-HTN medications than females. Within the study period, subjects who came back to doctor for review were again questioned about their adherence, awareness and knowledge on medications and clinical condition. 60% of these subjects had improved adherence and knowledge compared to their last visit. **Conclusion-** The study highlighted that the percentage of adherence in rural hypertensive patients is satisfactory, which may be due to the increased initiation of awareness programs and educating rural people by the clinical pharmacists and health care professionals. The effective pharmacist education plays a major role in improving adherence, knowledge and the treatment outcome.

Keywords

Adherence, anti-hypertensive medications, knowledge, patient education, rural, urban.

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INTRODUCTION

Hypertension is one of the most significant risk factors identified by World Health Organization (WHO) for morbidity and mortality worldwide. High blood pressure is asymptomatic, leading to its description as a 'silent killer'. Every year globally, directly, or indirectly hypertension causes deaths of at least nine million people [1]. Hypertension causes stroke, heart disease, kidney disease and macro vascular disease.

Blood pressure is the force of blood exerting against the walls of arteries, each time the heart beats, pumps blood into arteries. The blood pressure is highest when heart beats, the pumping blood is

called systolic pressure. When the heart is at rest, between beats, blood pressure falls which is called diastolic pressure. 120/80 is the normal range of blood pressure. Usually, the systolic number comes before or above the diastolic number [2].

Medication adherence is defined as "The extent to which a person's behavior – taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider" [3] [4]. Globally, patient medication non-adherence is a major medical problem leading to severity in many other clinical conditions.

There are two types of Medication adherence:

- Initial adherence: The patient fills the medication prescribed first time, and continues adherence, where the patient continues to refill the medication.

The following are the self-reported adherence problems:

1. Perceived drug harms versus benefits.
2. The need of their medication.
3. Out-of-pocket pharmacy costs.

Initial adherence may be the beginning of a complex series of behavior changes that can have a long-term effect on patient health and well-being.

- Initial non-adherence: When a patient fails to present a prescription to the pharmacy after it has been first ordered by the health care provider, or neglects to claim a prescription after it has been filled by the pharmacist [5].

The factors contributing to poor medication adherence are myriad, including the socioeconomic, demographic, therapy- related, concomitant medical-behavioral conditions, patient-related factors, healthcare team and system-related factors. In the management of non-adherence, recognizing the categories of factors causing the non-adherence is of utmost important [7].

The medication-taking behavior is individual and extremely complex. It requires numerous multi-factorial strategies to improve adherence.

The general aspects of medication adherence include:

- Medication adherence is not exclusively responsibility of patient.
- Increasing adherence may have a greater effect on improving health and reduction of health-care costs.
- Specific interviewing skills are required for identification of non-adherence.
- Medication-taking behaviour is complex and involves patient, physician, and process components [6].

Simplifying the treatment regimen by including single-pill combinations, developing of electronic health tools and executing a team-based approach may all contribute to the improving of adherence in patients.

The aim of the study is to assess the knowledge and adherence to prescribed anti-hypertensive medications in patients diagnosed with hypertension.

MATERIALS AND METHODS

This is a cross-sectional observational study conducted over a period of six months (September 2019- February 2020) in patients diagnosed with Hypertension and are on anti-hypertensive medication for controlling their blood pressure and visiting Out-patient department (OPD) at a tertiary care hospital in Hyderabad. Our study was conducted in 300 hypertensive patients after obtaining the ethical clearance from hospital ethics committee. A questionnaire was designed by consulting the health practitioners in the hospital and data collection was done using abstraction format in a uniform and comprehensive manner. A pilot study has been performed in 20 subjects prior to the conducting of project. The questionnaire was then revised for the feasibility of understanding by the enrolled subjects. Patients after giving their consent were asked to fill the questionnaire. All the subjects enrolled in our study were counseled about the lifestyle modifications and the importance of adherence to medication for proper control of blood pressure. Patient information leaflets (PIL's) were designed in all the three languages (Telugu, English, and Hindi) and were handed out at the end of the counselling session to the patient. Data collected was entered and analyzed using SPSS software version 26. Chi-square test was done to examine the relation between males, females and their adherence to medications and knowledge on complications of uncontrolled blood pressure. P-value < 0.05 was considered as statistically significant.

Study criteria-

The study is carried out using the following factors-

Inclusion criteria

- Patients diagnosed with hypertension.
- Patients with blood pressure >140/90mHg.
- Subjects with age limit >18 years.
- Subjects of either gender.

Exclusion criteria

- Pregnant and lactating women
- Patients with age ≤18 years
- Paediatric patients
- Patients with abnormal mental status

- Persons who underwent cardiac surgery.

RESULTS

1. Gender-wise Graphical distribution of subjects - Among the total 300 subjects, 41% were female and remaining of 59% were male. The tabular and pictorial representation of gender-wise grouping of subjects is given in Table 1 and Figure 1, respectively.

Gender	n	%
Male	176	59.00%
Female	124	41.00%
Total	300	

Table-1: Gender-wise grouping of subjects

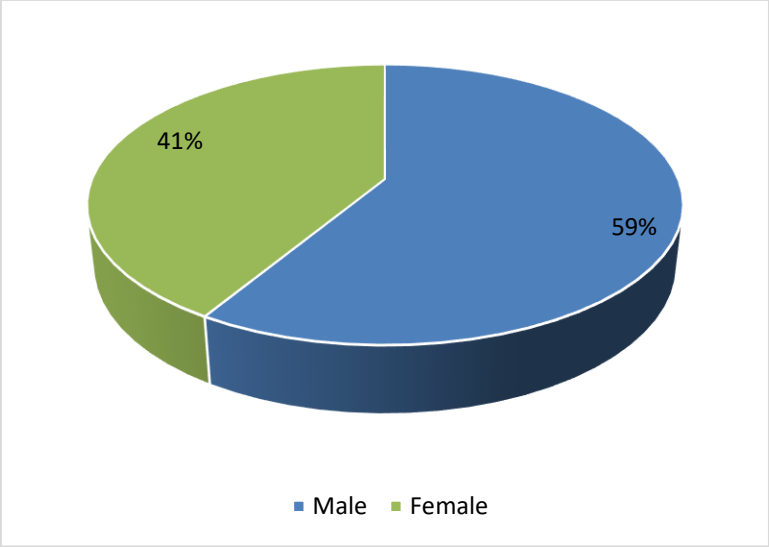

Fig 1: Pictorial representation of gender-wise grouping of subjects

2. Distribution of subjects according to the age- The enrolled 300 subjects were reviewed based on their age and are grouped into different age groups with a class interval of 10. The maximum number of subjects enrolled were in between the age group of 51-60 (37.3%), followed by subjects in age group of 41-50 (27%) and minimum number of subjects were found in the age group of 11-20 (0.3%). The mean age was found to be **54.82±11.4**. The descriptive statistics of age are given in Table no. 2.1 and the pictorial representation of subjects according to the age is shown in Figure 2.

Age group	Frequency	%
11-20	1	0.30%
21-30	3	1.00%
31-40	22	7.30%
41-50	80	27.00%
51-60	112	37.30%
61-70	61	20.30%
71-80	15	5.00%
81-90	4	1.30%
>90	2	0.50%

Table 2: Distribution of subjects according to the age

	N	Minimum age	Maximum age	Mean	Std. Error	Std. Deviation	Variance	Skewness
AGE	300	20	95	54.82	0.658	11.4	129.954	0.258

Table 2.1: Descriptive statistics of age

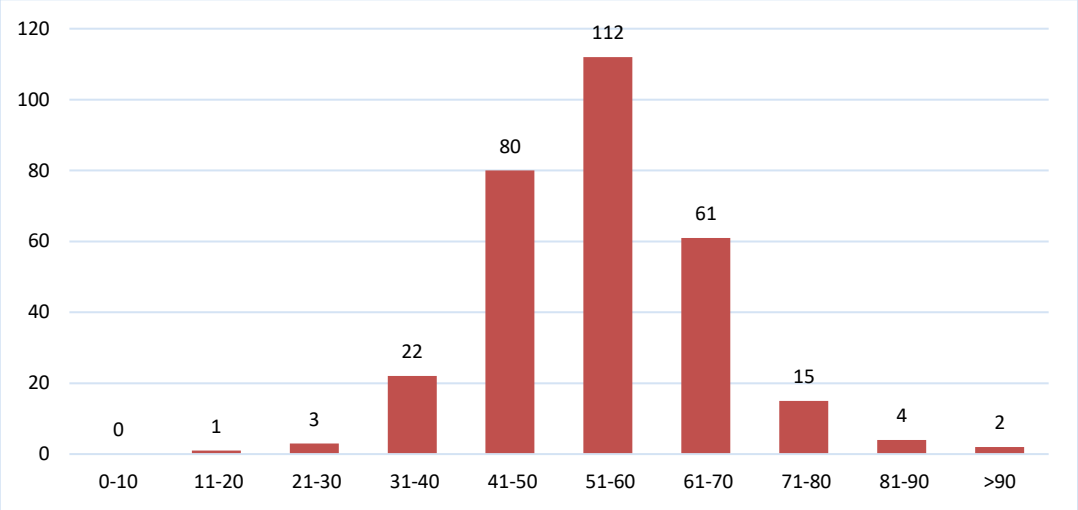

Fig. 2: Graphical distribution of subjects according to the age

3. Distribution of subjects according to place of residence-

Total subjects enrolled in the study are classified according to their place of residence. Among them, the subjects are almost equal in number from both rural (n=151) and urban (n=149). The tabular and pictorial representation of subjects according to their place of residence is shown in table 3 and figure 3 respectively.

Place of residence	n	%
Rural	151	50.33%
Urban	149	49.67%
Total	300	

Table-3: Distribution of subjects according to their place of residence

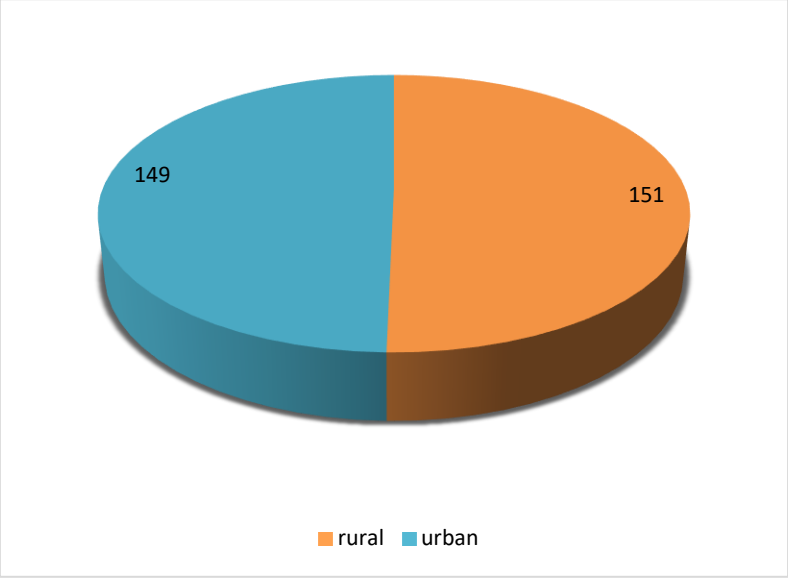

Fig. 3, Pictorial representation of place of residence wise distribution of subjects

4. Distribution of subjects according to the place of residence and awareness on their prescribed Anti-HTN drug name-

Of all the 300 subjects, rural accounts for 50.3% and urban accounts for 49.7% of the total enrolled population. It was found that urban population are more aware of their anti-HTN drug name that has been prescribed to them when compared to the rural population. The tabular and pictorial representation of subjects according to their place of residence and awareness on their prescribed anti-HTN drug name are shown in table 4 and figure 4 respectively.

Place of residence	Aware (n)	%	Aware (n)	%
Rural	58	38.5	93	61.5
Urban	69	46.3	80	53.7

Table-4: Distribution of subjects according to the place of residence and awareness on their prescribed anti-HTN drug name.

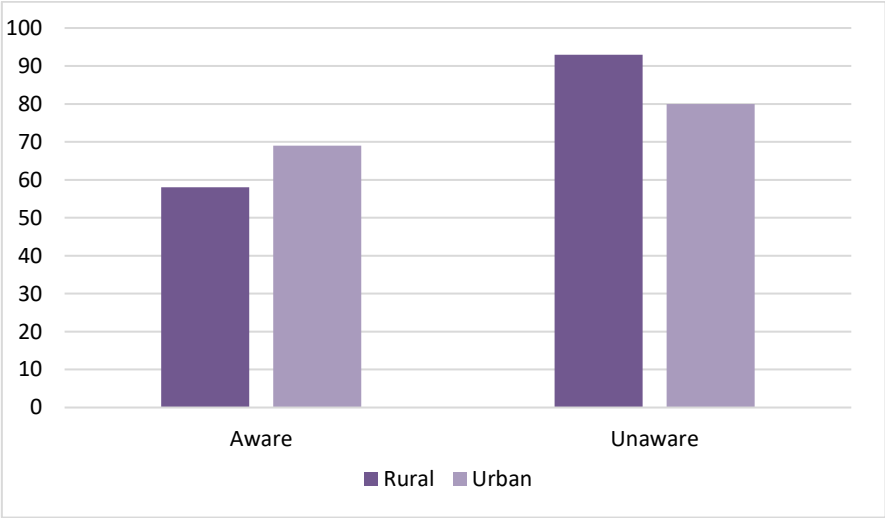

Fig. 4, Graphical distribution of subjects according to the place of residence and level of awareness on their prescribed Anti-HTN drug name.

5. Distribution based on the knowledge of the subjects about the complications of uncontrolled Blood Pressure-

Large number of patients (58%) of the total enrolled subjects are not aware about the complications of the uncontrolled BP. Only 42% of the subjects are aware about the complications and this awareness in subjects is either through counselling by the health care professionals or through the self-experience of some of the complications due to uncontrolled BP in the patients. The tabular and pictorial representation of distribution of subjects based on the knowledge on complications of uncontrolled blood pressure is shown in table 5 and figure 5, respectively.

Subject knowledge on complications	n	%
yes	126	42.00%
no	174	58.00%

Table-5: Knowledge-wise distribution of subjects

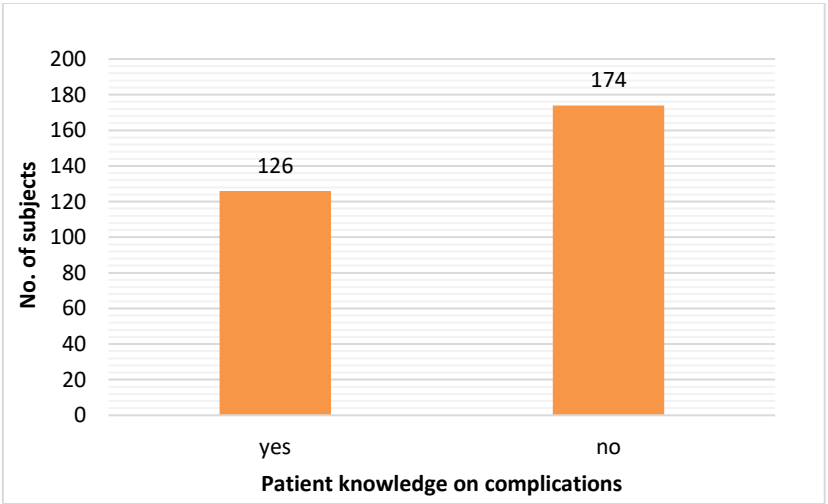

Fig 5: Distribution of subjects based on their knowledge on the complications.

6. Distribution of subjects according to adherence to their medications-

Of all the enrolled 300 subjects, 242 (81%) subjects were found to be adherent to their daily prescribed intake of anti-HTN drugs. Rest 19% (n = 58) of subjects were non-adherent to their medications. The common reasons for non-adherence were mostly forgetfulness or takes the medicine only when ill. The tabular and pictorial distribution of subjects according to adherence to their medications are shown in table 6 and figure 6, respectively.

Adherence to medications	n	%
Adherent	242	81%
Non-adherent	58	19%

Table 6: Distribution of subjects according to adherence to their medications

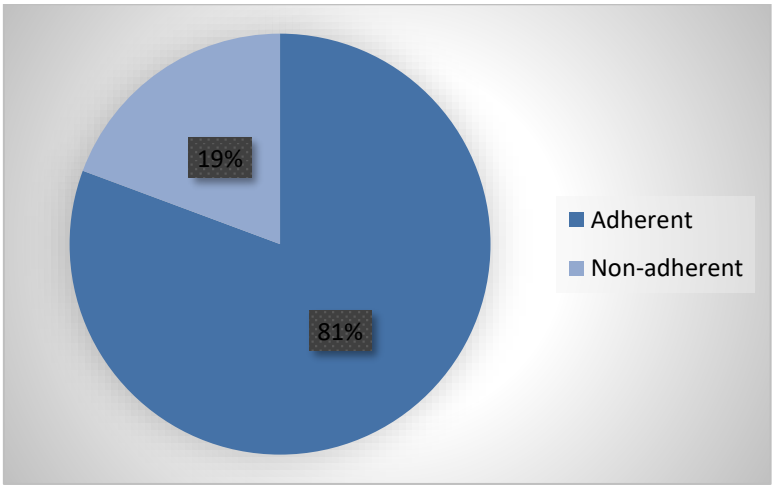

Fig 6: Pictorial distribution of subjects according to adherence to their medications.

7. Distribution of subjects according to the place of residence and adherence to their medications-

Most of the subject's adherent to their medications are from the urban region i.e., 126 (85%). A slight decrease in the number of subjects i.e., 116 (77%) were adherent to their medications in the rural region. The pictorial distribution of subjects according to the place of residence and medication adherence are shown in Figure 7.

	Rural (n)	%	Urban (n)	%
adherent	116	77%	126	85%
non-adherent	35	23%	23	15%

Table 7: Distribution of subjects according to the place of residence and adherence to their medications

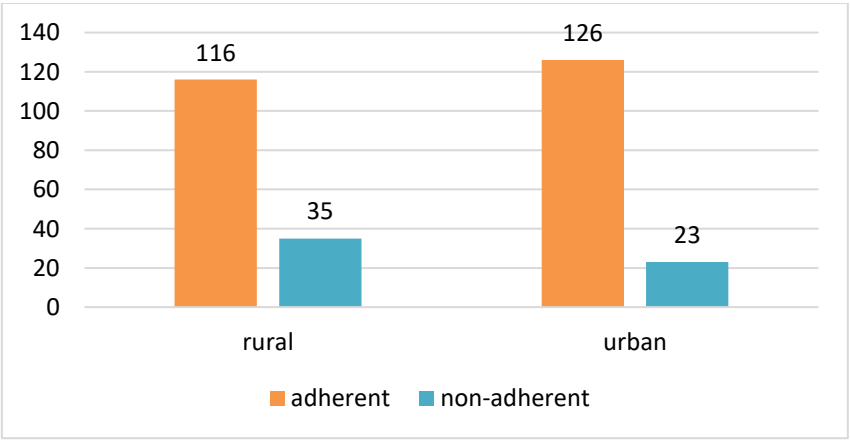

Fig 7: Graphical distribution of subjects according to the place of residence and adherence to their medications.

8. Prevalence of adherence among males and females-

Table 8 shows the prevalence of adherence to Anti-HTN medications among males and females. Males are more adherent to their Anti-HTN medications when compared to females. Thus, the percentage of females being non-adherent to their anti-HTN medications is high when compared to males. Chi-square test was done to examine the relation between males, females and their adherence to medications. The relation between these variables was statistically significant, X^2 (1, N=300) = 4.352, p=.036 (p<.05). Males are more adherent to their Anti-HTN medications than females.

Adherence	males	females
	Number/(Percentage)	Number/(Percentage)
Adherent	149 (84.6)	93 (75)
Non-adherent	27 (15.4)	31 (25)

Chi square=4.352* (p<.05)

Table 8: Prevalence of adherence to Anti-HTN medications among males and females

9. Prevalence of knowledge on complications of HTN among males and females-

Table 9 shows the prevalence of knowledge on complications of HTN among males and females. Males are more aware of the complications when compared to females. Chi-square test was performed to examine the relation between males, females, and knowledge on complications of uncontrolled blood pressure. The relation between these variables was found to be significant, X^2 (1, N=300) = 9.65, p=.0018 (p<.01). Males are more aware of the complications than female.

Level of Awareness	Males	Females
	Number/(Percentage)	Number/(Percentage)
Aware of complications	87 (49.5)	39 (31.5)
Unaware of complications	89 (50.5)	85 (68.5)

Chi square= 9.65* (p< .01)

Table 9: Prevalence of knowledge on complications of HTN among males and females

DISCUSSION

Hypertension and its complications are the major public health issue and globally it is the leading cause of admission in most of the health care settings. This study is conducted to evaluate the knowledge, awareness and adherence in the patients with hypertension.

The present study showed that the hypertension incidence was high in males (59%) when compared to females (41%). Almost equal number of subjects from rural and urban regions were enrolled into the study and maximum number of subjects are within the age group of 51-60 years. It was found that urban population have slightly higher awareness of the prescribed anti-HTN drug name (46.3%) and adherence to their anti-HTN medication (85%) when compared to the rural population awareness of prescribed anti-HTN drug name (38.5%) and adherence to their medication (77%) which is consistent with the study by Misra P *et al* [8]. It is very clear from the results that not a much difference in percentages of adherence and awareness was seen between the urban and rural population which tells that adequate number of rural subjects were aware of their prescribed anti-HTN drug name and are adherent to their daily anti-HTN medications which maybe because of the increased awareness and educating people in rural regions by the medical professionals. As concluded by Balasubramanian A *et al*, that the adherence to medication among the rural patients was low [15]. In contrast to this study, our study highlighted that the percentage of adherence in rural hypertensive patients was satisfactory.

The common reasons of non-adherence in the subjects of our study were found to be forgetfulness or takes the medication only when sick, interferences of the household work and absence of symptoms. It is similar to the study by S. Pirasath *et al*., who concluded the reasons of non-adherence to be forgetfulness and interruptions of the house-hold routine [9] and consistent to another study by Venkatachalam J *et al*. [10]. In our study, small percentage of subjects takes their prescribed anti-hypertensive drug only when they experience any symptoms of high BP or when sick.

Males are found to be more adherent to their daily anti-HTN medications than females. A significant relation was seen between males and females and their adherence to medications. Prevalence of knowledge on complications of hypertension was found to be high in males and a significant relation

was also seen between the subjects of both sexes and knowledge on complications of HTN.

This study also concluded that, large number of subjects were observed to have low awareness on the complications of uncontrolled blood pressure (58%) which is consistent with other studies by Ibrahim MM *et al* [11], Ahmad K *et al* [12], Farag YM *et al* [13]. Thus, during continuation of treatment, dissemination of knowledge about the disease and counseling to the patients is very crucial [14].

Patient education was given to subjects after the questionnaire has been filled. Patient information leaflets (PIL's) were handed out to the patients at the end of the counselling session. Within the study period of 6 months, 120 subjects out of the total 300 subjects enrolled, came back for the review to the doctor and these patients were again questioned about their adherence, awareness and knowledge about their medications and clinical condition. It was found that approximately 60% of the subjects who came for the review had improved adherence and knowledge when compared to their last visit. This concludes the importance of pharmacist education given to the subjects was effective and plays a major role in improving the adherence, knowledge and the treatment outcome. This was consistent with the other study done by Naveen B *et al* [16] who concluded the importance of the role of clinical pharmacist in improving the treatment outcome and quality of life in hypertensive patients.

CONCLUSION

The adherence to the prescribed anti-hypertensive medications in majority of the subjects was reasonable. The study highlighted that the percentage of adherence in rural hypertensive patients is satisfactory, which may be due to the increased initiation of awareness programs and educating people in the rural regions by the clinical pharmacists and health care professionals. The common reasons for non-adherence were found to be forgetfulness, interference due to household works or taking medication only when the patient feels ill. The enthusiasm among the study population regarding the diet and diet pattern to be followed for controlling the blood pressure is appreciable.

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