Journal of Positive School Psychology
2022, Vol. 6, No. 5, 9124–9129

Patient Compliance with Anti-Hypertensive Medication to Control their Blood Pressure in the Udaipur Region

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Abstract

Hypertension has become a global burden. Pharmacological and Non-pharmacological therapies have been considered as primary intervention for uncontrolled hypertension. However, there is a huge rate of non-compliance seen in the patients. It has been due to various reasons ranging from ethnicity, socio-demographic factors to misconceptions and beliefs of the patients. Adherence to medication is important to manage blood pressure. This is descriptive (cross- sectional) study approved by the research committee. 117 participants were enrolled through hospitals and clinics. Researcher filled the questionnaire through one-to one interview based method. An informed consent was signed by the participants after the consultation with the doctor in-charge. Data was entered into excel and analysis was done in SPSS. Descriptive statistics involving percentages and frequencies and chi-square test was used to find associations between variables. 74.4% participants were non adherent to the medication. The population had more females (55.6%) than males (44.4%). The reasons stated were forgetfulness (20%), side effects (20%), misconceptions (40%), busy schedules, health care cost and mainly negligence towards health. Though the population was literate, non-compliance rate was high. The age groups and smoking were significantly associated with medication compliance ($p=0.038$, $p = 0.004$). Patients' non-compliance with medication has been a major reason for uncontrolled hypertension. Lifestyle factors such as consumption of alcohol and smoking also contribute to the same. Forgetfulness, carelessness, side effects, misconceptions, negligence towards health, busy schedules are some of the reasons. It is important to address the beliefs of patients to increase the rate of compliance and increase awareness of the disease progenies and treatment protocol

Keywords: Hypertension, anti-hypertensive medication, lifestyle factors, compliance, Non-adherence

I. INTRODUCTION

Uncontrolled hypertension has been the main reason for cardiovascular diseases. Hypertension therefore has become a huge matter of concern in India as well as other countries. The rate of hypertension control is only 6% in India. It has been depicted that by the end of 2025 there would 200 million people with hypertension. The reasons determined for uncontrolled hypertension are low literacy levels, misconception about disease prognosis, treatment regime and awareness about the disease, poor compliance of anti-hypertensive medication and lifestyle modifications. Patients' low compliance towards anti-hypertensive medication has been a major reason for uncontrolled hypertension [1]. Patients report a number of reasons for being non-compliant towards the treatment protocol.

Even healthcare professionals do not pay attention to this aspect. A concept of con-concordance has recently being introduced for understanding the beliefs of the patient and improves their compliance towards treatment protocol [2]. The reasons quoted for non-adherence differ amidst populations. There are various questionnaires designed to measure the rate of compliance in hypertensive patients. Some are Morisky medication adherence scale-8 [3], Brief medication Questionnaire [4], some measure the self-care behavior including the medication adherence amidst the patients: H-SCALE [5] is one such questionnaire. Compliance and adherence are common terms to address patients' behavior [6]

The aim of the current study was to understand the factors affecting blood pressure in Udaipur city. The objectives of the current study were to check the medication compliance amidst hypertensive individual and to study their demographic and dietary factors affecting their blood pressures.

II. METHODOLOGY

This is a descriptive research (cross-sectional study) study. The study was approved by Institutional Ethical Committee for Human Research of Maharana Pratap University of Agriculture and Technology (MPUAT).

Selection of Samples: The participants were taken from hospital and small clinics in Udaipur through surveys. Before commencement of the study, permission from the authorities was taken. The participants were of both the genders from age 40 – 60 years. The inclusion criteria were: hypertensive individuals with no serious co-morbidity and a history of 2 years. Patients with serious heart diseases, with history of heart attack were excluded from the samples. A random sampling method was used to enroll the participants. The sample size was 117 participants. Many patients were excluded from the study since they did not fit into the objective of the study

The patients were approached after their consultation with the doctor. The patients were explained about the purpose of the study and an informed consent was signed those who were ready to provide information. Later on, the questionnaire was being filled by the researcher herself.

A structured self – designed questionnaire was developed for the study. The questionnaire included: demographic section, substance abuse and anti-hypertensive medication. Blood pressure was recorded by doctors and noted by the researcher from the prescription form. Questions regarding age, gender, education qualification, income and substance abuse were included in demographic section. Questions related to cigarette smoking and consumption of alcohol was included. Dosage, timing and list of medications currently taken by the participants were recorded. The data was collected via interview method. Each participant took 10-12 minutes in completing the questionnaire. Majority of the questionnaires were filled by the researcher through one to one interview method. The questionnaires were cross checked and missing details were filled.

Statistical Analysis: Statistical analysis was done by SPSS software (version 22). The data was first entered into excel and then in SPSS to avoid errors. The variables were categorized and codes were assigned. Descriptive statistics were used: percentages, frequencies, standard deviations of the assigned variables. Chi-square test was used to identify the associations for anti-hypertensive medication, gender, age group and their recorded blood pressure.

III.RESULTS

The results of the study were as follows:

Demographic characteristics: The socio-demographic characteristics of the participants is shown in Table 1. Out of 117 participants 52 (44.45%) were males and 65 (55.6) were females. Almost half of the population (42%) were 55 years or above of age. Only 14.5 percent of participants were of 40 - 45 years of age. Out of all the participants only 13.7% reported drinking alcohol and 4.3% reported smoking cigarettes. All the participants were literate as per the definition of literacy. 15% had middle school certificates, 40% high school certificates, 2% had done diplomas and 43% had higher degrees. However, majority of

females were housewives (44%) and some took retirement from work 6%) hence were not earning (58%).

Tables are as follows:-

Table 1: *Socio-demographics of the participants (n=117)*

Variables	Percentages of participants (n)
Gender	
Male	44.4(52)
Female	55.6(65)
Age	
40-45	14.5 (17)
46-50	20.5 (24)
51-55	23.1 (27)
56-60	41.9 (49)
Alcohol	
Yes	13.7 (16)
No	86.3 (101)
Smoking	
YES	4.3 (5)
No	95.7 (112)
Education	
Middle school Certificate	15.4 (18)
High School Certificate	40.2 (47)
Diploma	1.7 (2)
Graduate	27.4 (32)
Professional	15.4 (18)
Occupation	
Housewife	43.6 (51)
Retired	6.0 (7)
Private Organisation	26.5 (31)
Government Organisation	14.5 (17)
Business	9.4 (11)
Income	
<25000	4.3 (5)
25000-50000	3.4 (4)
50000-1,00,000	17.1 (20)
>1,00,000	25.6 (30)
Non	49.6 (58)
Medication	
Regular	25.6 (30)
Irregular	74.4 (87)

Table 2: *Association of anti-hypertensive medications with other variables.*

Other variables	Medication Compliance		Chi-square value	p-value
	Regular	Irregular		
Age			8.411	0.038*
40-45	9	8		
46-50	4	20		
51-55	5	22		
56-60	12	37		
Education			2.021	0.732
Middle school Certificate	5	13		
High School Certificate	12	35		
Diploma	1	1		
Graduate	6	26		
Professional	6	12		
Alcohol			3.188	0.074
Yes	7	9		
No	23	78		
Smoking			8.095	0.004*
YES	4	1		
No	26	86		

**p<0.05 is considered significant*

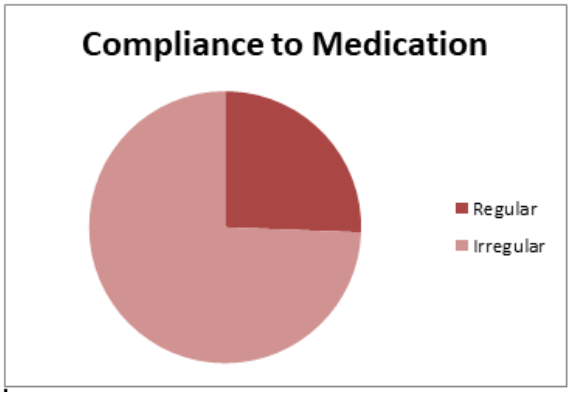

Figure 1: *Compliance to medication (n=117)*

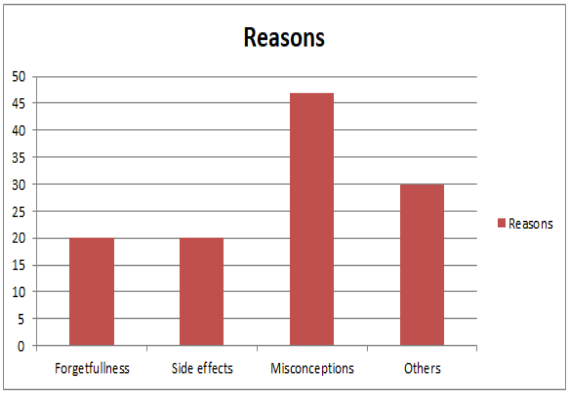

Figure 2: *Reasons for non-adherence of anti-hypertensive medication*

Anti-Hypertensive Medication: Only 25.6% of the participants reported taking medication on

regular basis as shown in Figure 1. 74.4% of the participants were not taking their medications timely. Figure 2 explains the reasons of non-adherence to the therapy. Majority of them reported having misconceptions regarding the medication or treatment protocols. Some reported forgetfulness and side effects (17.9%) as their reasons for non-adherence. Other reasons quoted were non availability of medication, following other remedies (ayurvedic, home remedies) to control their blood pressure.

Table 2 depicts the association of medication with other parameters of the study. The association of age group and smoking with compliance of medication has found to be significant ($\chi2=8.411$, $p=0.038$; $\chi2=8.095$, $p= 0.004$). The consumption of alcohol with anti-hypertensive medication can also be considered as significant ($\chi2=3.188$ $p=0.074$). However, the association of education with medication was not significant.

IV. DISCUSSION

Hypertension can be controlled with lifestyle modifications and consistent pharmco-therapies. Both the therapies help in controlling blood pressure especially systolic blood pressure which is considered as a bigger risk for cardiovascular diseases. Lifestyle changes also have an impact on blood pressure. Reduction of salt in diet, moderate tobacco and alcohol consumption, regular physical activity and consumption of fruits and vegetables helps in managing blood pressure [7]. Both the therapies go hand in hand.

Non- adherence to medication is a huge obstacle in controlling hypertension. It has become a major public health challenge. Prescribing medications to patients will not be effective as long as they actively consume it regularly. The patients' misunderstanding of the disease and general disapproval of the medication has been some major reasons for non-compliance. In-spite of the known benefits of regular consumption of medication such as reduced complications, proper management of the blood pressure, reduce health care cost, reduced incidences of hospitalizations, the percentage taking it on regular basis is low. The estimated prevalence of non- adherence to anti-hypertensive medication in Asia was 48%, 60.6% in a study from Mumbai, 45.8% in Mangalore and 51.7% in Pakistan, 45% in a review [1, 8-9]. In line with previous studies, non-adherence to medication in this study was also found to be very low (74.4%). However few studies have also reported high compliance towards anti-hypertensive medication [10-11]. It was also reported that non- adherence was seen higher in females as compared to males [9].

A review conducted in Asia reported a number of reasons for non-adherence with anti-hypertensive medication depending on their socio economic factors, therapy related and diseases related factors. The reasons stated were forgetfulness, language barriers and patients' preferences, knowledge about the disease and family support. Other factors include side effects of medication, health care cost, more than 1 medication prescribed, unemployment, low income and poor communication between health care providers [9]. Some also reported perceived side effects after taking medication such as tiredness, muscle pain and poor sleep. Perceived Side effects was a major reasons for non- compliance in some studies [10-12]. Verulava & Mikiashvili (2021) reported that 43% of the participants forgot to take their medications and 26% do it on purpose. It was due to high health care cost (22%) and busy schedules (16%) which made them skip their medication. Underdosing and frequencies was also one reason stated [13]. Patients' lack of self-efficacy, tendency to stop medication without doctor's advice, forgetting to buy medicines or laziness towards it also result it non-compliance [6]. In line with these studies, the present study reports misconception (40%) as the major reason for non-adherence. Forgetfulness and side effects was reported by 20% of the participants. Also, this study reports negligence towards health as a big reason for non-adherence. Hypertension is considered as a 'silent killer' as it is symptomatic in earlier stage. Patients' at this stage do not perceive the

risk of uncontrolled hypertension. Hence they feel unnecessary to take medications timely.

Age was significantly associated with medication compliance in the present study ($\chi2$=8.411p=0.038). People in younger population are more aware towards the treatment protocol and can distinguish between myths and facts. As a person age, forgetfulness increases and affordability decreases which can be other reason for lower medication compliance in older age group. Similar findings were seen in Shah et. al. However few studies have reported that older individuals are more compliant towards the treatment protocol. This can also be due to increased fear in such age group [14].

Low literacy levels have also been associated with medication non- adherence. It is simply because less knowledge about the disease and the understanding about the treatment [15]. However the results were not significant in this study. Even the literate population was irregular with their medication. This can be due to their busy schedules. People who are educated are likely to understand and follow the treatment more judiciously which can result in success of intervention programs [16].

Smoking and alcohol have also being associated with risk of uncontrolled hypertension and cardiovascular diseases. A smoker is 10 folds higher risk of developing cardiovascular diseases. Smoking causes systemic inflammation and arterial stiffness which increases the arterial tension [17]. It has also been seen that people who smoke make changes in their medication dosages. This might be due to perceived risk from the deleterious effects of smoking. The results of the present study are in line with this and were found statistically significant ($\chi2$=8.095, p= 0.004).

Strengths and Limitations of the study: This is the first to study to report medication compliance in this area of Rajasthan, India. Low sample size can be one of the limitations of the study. The responses were based on patients' answers (subjective method) rather than using a well-developed scale for medication adherence.

V. CONCLUSION

Monitoring of treatment protocol is required to control hypertension.Interventions must be planned accordingly to the ethnicity, culture, economic and socio-demographic factors. They must be cost effective and easily implementable [9]. Along with these target behavioral therapies including understanding of patients' belief should be considered. Patients' awareness about the management of disease and deleterious long term effects of uncontrolled hypertension should be one of major step.

VI. ACKNOWLEDGEMENT

A warm gratitude to Department of Medicine, RNT Medical college and Ethical committee of CCAS, MPUAT, Udaipur for assisting us for data collection and completion of the study.

CONFLICT OF INTEREST

None declared.

REFERENCES

1. Shah A, Singh V, Patil S, Gadkari M, Ramchandani V, Doshi K. Factors affecting compliance to antihypertensive treatment among adults in a tertiary care hospital in Mumbai. Indian Journal of Community Medicine 2018; 43:53.
2. Ross S, Walker A, MacLeod M. Patient compliance in hypertension: role of illness perceptions and treatment beliefs. Journal of Human Hypertension 2004; 18:607-613.
3. Morisky D, Green L, Levine D. Concurrent and Predictive Validity of a Self-reported Measure of Medication Adherence. Medical Care 1986; 24:67-74.
4. Svarstad B, Chewning B, Sleath B, Claesson C. The brief medication questionnaire: A tool for screening patient adherence and barriers to adherence. Patient Education and Counseling 1999; 37:113-124.
5. Najimi A, Mostafavi F, Sharifirad G, Golshiri P. Development and study of self-efficacy scale in medication

adherence among Iranian patients with hypertension. Journal of Education and Health Promotion 2017; 6:83.
6. Sutar P, Shah H. A study of adherence pattern toward antihypertensive therapy (antihypertensive drugs, dietary habits, and physical activity) and certain factors affecting it. International Journal of Medical Science and Public Health 2017; 6:1.
7. Verulava T, Mikiashvili G. Knowledge, awareness, attitude and medication compliance in patients with hypertension. Arterial Hypertension 2021; 25:119-126.
8. Abegaz T, Shehab A, Gebreyohannes E, Bhagavathula A, Elnour A. Nonadherence to antihypertensive drugs. Medicine 2017; 96:e5641.
9. Mahmood S, Jalal Z, Hadi M, Khan T, Haque M, Shah K. Prevalence of non-adherence to antihypertensive medication in Asia: a systematic review and meta-analysis. International Journal of Clinical Pharmacy 2021; 43:486-501.
10. van der Laan D, Elders P, Boons C, Beckeringh J, Nijpels G, Hugtenburg J. Factors associated with antihypertensive medication non-adherence: a systematic review. Journal of Human Hypertension 2017; 31:687-694.
11. Woode E, Boakye-Gyasi E, Obirikorang Y, Adu E, Obirikorang C, Acheampong E et al. Predictors of medication nonadherence among hypertensive clients in a Ghanaian population: Application of the Hill-Bone and Perceived Barriers to Treatment Compliance Scale. Health Science Reports 2022; 5. doi:10.1002/hsr2.584
12. Obirikorang Y, Obirikorang C, Acheampong E, Odame Anto E, Gyamfi D, Philip Segbefia S et al. Predictors of Noncompliance to Antihypertensive Therapy among Hypertensive Patients Ghana: Application of Health Belief Model. International Journal of Hypertension 2018; 2018:1-9.
13. Novello M, Rosa M, Ferreira R, Nunes I, Jorge A, Correia D et al. Compliance with the Prescription of Antihypertensive Medications and Blood Pressure Control in Primary Care. Arquivos Brasileiros de Cardiologia Published Online First: 2017. doi:10.5935/abc.20170009
14. Alhaddad I, Hamoui O, Hammoudeh A, Mallat S. Treatment adherence and quality of life in patients on antihypertensive medications in a Middle Eastern population: adherence. Vascular Health and Risk Management 2016; Volume 12:407-413.
15. Mahmood S, Jalal Z, Abdul Hadi M, Orooj H, Shah K. <p>Non-Adherence to Prescribed Antihypertensives in Primary, Secondary and Tertiary Healthcare Settings in Islamabad, Pakistan: A Cross-Sectional Study</p>. Patient Preference and Adherence 2020; Volume 14:73-85.
16. Khalil W, Tartour M. [Op.2b.05] Effect Of Health Education Intervention On Improving Compliance To Treatment Among Hypertensive Patients. Journal of Hypertension 2017; 35:e16.
17. Polosa R, Morjaria J, Caponnetto P, Battaglia E, Russo C, Ciampi C et al. Blood Pressure Control in Smokers with Arterial Hypertension Who Switched to Electronic Cigarettes. International Journal of Environmental Research and Public Health 2016; 13:1123.