

A cross-sectional study on adherence to treatment and life-style modifications in hypertensive patients attending the urban health centre of a teaching hospital in Hyderabad

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ABSTRACT

Introduction: The burden of hypertension is expected to double by 2025 and adherence to treatment has a key role in disease outcome. The World Health Organization defines adherence as the extent to which a person's behaviour of taking medication, following a diet and/or exceeding life-style changes, corresponds with the agreed recommendations of health care providers. The study tries to assess the level of adherence to medication and life-style modifications in hypertensive patients. **Materials and Methods:** It is a cross-sectional study among patients attending urban health centres of a teaching hospital. The study population included all hypertensive patients above 30 years. Based on the prevalence of non-adherence to hypertensive medication, 70% of the sample size is calculated as 182. A Morisky medication adherence scale is used to find adherence to treatment. Life-style modification was also assessed. Scoring was done based on their adherence to treatment and life-style modifications and quantified. **Results:** The mean age of the study population was 55 years (38–80 years). In total, 58.33% were illiterate and 21% were retired from work. Around 87.5% had to spend money on medication. Mean weight, height, hip and waist circumference was 66 kg, 157 cm, 108 cm and 100 cm, respectively. Mean BMI was 26.6. Prevalence of good adherence to medication was 129 (70.83%) and that of good life-style modifications was 127 (70.17%). **Conclusion:** The adherence to medication and life-style modification was satisfactory. Family physicians have a key role in Non communicable diseases (NCD) management and should focus on ongoing education programmes for treatment adherence and life-style modifications at a community level, and grass-root level workers should conduct regular follow-up activities.

Keywords: Adherence, hypertension, life-style modifications

Introduction

India is facing the epidemiological transition with a double burden of communicable and non-communicable diseases.

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Hypertension is one of the non-communicable diseases leading to increasing mortality, morbidity, and disability. An estimation of 1.28 billion adults, worldwide in the age group between 30 and 79 years, has hypertension.^[1] The cases of hypertension are on the rise though many are underdiagnosed. According to NFHS 5 among the population with 15 years and above the prevalence of hypertension among adults in India among females and males is 21.3% and 24%, respectively.^[2] In Telangana, the

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prevalence of hypertension in females and males is 26.1% and 31.4%, respectively.^[3]

Hypertension is a risk factor for ischemic heart disease, peripheral vascular disease, acute myocardial infarction and stroke. If treatment for hypertension is given and controlled effectively, it can reduce the burden of cardiovascular diseases to a great extent.^[4] The cut-off point in diagnosing hypertensive patients is 140 mm Hg, systolic and 90 mm Hg, diastolic based on epidemiological studies.^[5] Even though effective medications are available to treat hypertension, poor adherence poses a significant risk in reaching proper control. Other challenges to the proper management of hypertension include low detection rates, attitude of the patient, irrational prescription, and access to health care facility, co-operation of family members, economic condition of the patient and lack of adherence.^[6]

Primary care physicians have a key role to play in the early detection, treatment and follow-up of hypertensive patients. Considering the high prevalence of the disease, through opportunistic screening early detection can be done at primary health care. Primary care physicians are the first point of contact in the community with a doctor. Other than the pharmacological management of the disease, they can also contribute towards improving the knowledge of the patients regarding self-care and life-style modifications to prevent complications. With regular follow-up, family physicians can also monitor blood pressure levels, ensure control status of hypertension and help them achieve proper adherence to medications. Counselling of patients about the importance of adherence to medication is vital in preventing complications.^[7] The patients' understanding and perception about the illness acts as a contributing factor to continuing taking medication.^[8,9]

The World Health Organization (WHO) defines adherence as "the extent to which a person's behaviour of taking medication, following a diet and/or exceeding life-style changes corresponds with agreed recommendations of health care provider".^[10] The rates of adherence to hypertensive medication varied from 27% to 70%.^[11,12] WHO emphasized that "increasing the effectiveness of adherence interventions may have a far greater impact on the health of the population than any improvement in specific medical treatments." Lack of treatment adherence to medication may not only compromise the health of individual but also have a serious economic impact on the families.^[13] The socio-economic status can be one driving factor causing poor adherence to medication and favouring disease advancement.^[14] Adherence to treatment gives information on the effectiveness of treatment.^[15,16]

Making sure of adherence to treatment is as important as diagnosing the illness. A structured questionnaire with factors responsible for non-adherence to anti-hypertensive medications and life-style modifications will provide much needed information guiding the physician to prioritize the patients with poor adherence behaviour.^[17] However, the combined efforts

of physicians, nursing staff, pharmacist and policy makers can bring a change in the better health of patients.^[18] When life-style modifications go in hand with adherence to medication, much desired benefit of blood pressure control is obtained. Information about adherence to treatment studies is known less. This study tries to understand the factors responsible for adherence to treatment and life-style modification in patients attending urban health centre through opportunistic screening. With this background in mind, the present study is planned to be conducted in the urban centre of medical college in Hyderabad.

Objectives

1. To determine the level of adherence to anti-hypertensive medication and life-style modification in patients visiting urban health centre in Hyderabad.
2. To assess the determinants of non-adherence to medication and life-style modifications among these hypertensive patients.

Materials and Methods

A cross-sectional study was conducted among the hypertensive patients attending the urban health centre attached to a medical college in Hyderabad serving the urban slum community of Shaikpet Mandal, one of the biggest slums in Hyderabad, which has 19 bastis with a population of 90,132. The study was done for a period of 8 months. The duration included review of literature, data collection, data analysis and report writing. The data collection was initiated after obtaining the letter of approval from the Institutional Research Committee-Biomedical Research and Institutional Ethics Committee (Letter No.: EC/NEW/INST/1527/2022/11/43).

Sample size

Based on the prevalence of non-adherence to hypertensive medication, 70%^[9] of the sample size was calculated. Applying this prevalence (p) of 70% to the formula for cross-sectional study, Z^2pq/d^2 , precision 10% and non-response rate as 10%, the sample size comes 182.

Study participants

All the hypertensive patients above the age of 30 years, attending the out-patient department at the urban health centre, Sheikpet, was included in the study with their consent. All patients who were newly diagnosed and known hypertensive were included. People who are residing in the area for more than 6 months were included. All chronically ill patients, hospitalized and pregnant women were excluded from the study. Non-residents of the area were not included.

Data collection

The purpose of the study was explained to the study participants in local language and written informed consent was taken before data collection. Data were collected using one-to-one

interview techniques using a pre-validated semi-structured questionnaire. The questionnaire was translated to Telugu and back translated to English by a translator who is fluent in both languages. The questions were asked in local language. The questionnaire had three sections. The first section had clinical and socio-demographic details of the individual. The second section had questions on four-item self-report measure of medication taking behaviour. The third one had questions related to life-style modifications in hypertensive patients. A Morisky medication adherence scale (MMAS)^[19] was used to find adherence to treatment. Life-style modification was also assessed. The Tables 1 and 2 show scales of adherence to anti-hypertensive medication and life-style modifications. A score was given based on their adherence to treatment and life-style modifications. Clinical history of the patient, general physical and systemic examination of the patient was also done. Weight, height, waist circumference and hip circumference of the patient were recorded using standardized procedures. The blood pressure was recorded after the patient was made to sit comfortably in the OPD for 15 min. The left arm at the level of the heart was used to record the BP using a sphygmomanometer and stethoscope. The readings of systolic and diastolic were taken on the Phase 1 and phase V Korotkoff sounds, respectively.

For medication adherence, a four-item self-report measure of medication taking behaviour, MMAS was used.

Scoring: A score of “1” is given for “YES” and 0 for “NO”. A score of 2 and more is considered as low adherence. A score of <2 is taken as good adherence.

The risk factors of hypertension were incorporated into the questionnaire to check for the adherence to life-style modification. These are smoking, alcohol consumption, physical activity, salt intake, balanced diet and coping with stress. High

salt intake is considered when the person consumes extra salt put aside in plate along with meals and regular intake of pickles and packet foods having salt as recommended by WHO. Balanced diet is considered when person along with regular meals takes fruits and vegetable in the diet as recommended by WHO. Coping with stress is indicated by the person who performs his or her regular activities at home and workplace without emotionally being carried away.

Similarly for life-style modification in hypertensive patients.

Scoring: A score of “1” is given for “YES” and 0 for “NO”. A score of 3 and more is considered as having good life-style modification practice. A score of <3 is considered as life-style modification practices not up to the mark.

Statistical analysis

The data were entered to MS excel and analysed using SPSS 24 for windows platform (SPSS Inc., Chicago, II, USA). The frequency and percentages of hypertensive patients following good adherence to medication and life style modification were obtained. The factors determining medication adherence and life-style modification were found out using Chi square test. P-value <0.05 was considered statistically significant.

Results

Socio-demographic profile

The mean age of the study population is 55 years and it ranged from 38 to 80 years. Almost 58.33% patients included in the study were illiterate and 21% were retired from work. Majority of the patients (87.5%) had to depend on own funds to procure the medications.

Risk factors

The mean weight, height, hip and waist circumference was 66 kgs, 157 cm, 108 cm and 100 cm, respectively. Mean BMI was 26.6.

Table 1: Adherence to anti-hypertensive condition

Questions	Yes (1)	No (0)
1. Do you often forget to take your medicine?		
2. Do you find it difficult to follow the treatment schedule?		
3. When you feel better or blood pressure is under control do you stop taking your medicine?		
4. Sometimes if you feel worse while taking medication do you stop taking it?		

Table 2: Adherence to life style modifications

Questions	Yes (1)	No (0)
1) Did you quit smoking if you are a smoker?		
2) Did you stop alcohol consumption?		
3) Did you do physical activity of 30 min a day for 5 days a week?		
4) Do you eat foods with high salt content?		
5) Do you follow a balanced diet?		
6) Do you cope-up easily from the disturbances in your home or working environment?		

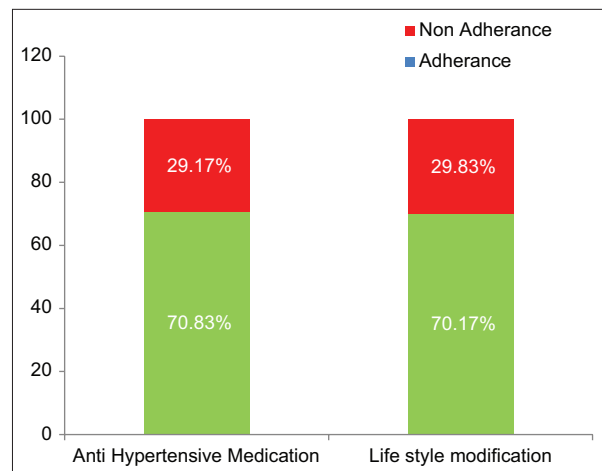


Figure 1: Level of adherence to hypertensive medication and life-style modification among patients

Adherence to medication and life-style modification: prevalence of good adherence to medication was 129 (70.83%) and that of good life style modifications was 127 (70.17%), as shown in Figure 1.

Factors associated with adherence to anti-hypertensive medication [Table 3]: The factors determining the medication adherence of hypertensive patients were their education status, clinical presentation at the time of diagnosis and presence of complications. The illiterates (85.85%) compared to the literates (50%) have shown good adherence to anti-hypertensive medication with a *P*-value <0.001. Hypertensive patients who were asymptomatic and were diagnosed as part of opportunistic screening had better adherence behaviour compared to those who were symptomatic with a *P*-value of 0.009. Those patients who had complications of hypertension had better adherence to the anti-hypertensive medication compared to their counterparts (*P*-value = 0.007).

Factors associated with life-style modifications [Table 4]: The factors determining the good adherence behaviour to life-style modification among hypertensive patients were male gender, no family history for hypertension, being illiterate, asymptomatic on clinical presentation and without co-morbidities (*P*-value <0.05).

Discussion

There are studies on adherence to anti-hypertensive medication which have shown the adherence to anti-hypertensive medication range from 27 to 70%. The prevalence rates vary due to the differences in the methodology and definitions used to describe adherence. In the present study, the prevalence of good adherence to medication was 71%. A study done by Nagarkar AM, *et al.*^[20] has shown 76.5% adherence, while a study by Bhandari S, *et al.*^[11] has shown 73% which are similar to the present study. Both these were also conducted among urban slum population and can be a reason for the similar higher adherence behaviour. A study by Balasubramanian A, *et al.*^[16] graded the prevalence as high, medium and low as 46%, 41.3% and 12.7%, respectively. A study by Dennis Thomas *et al.*^[21] has shown prevalence as 50%, while a study by Choudhary *et al.*^[22] has shown prevalence as 54.6%. A study by Venkatachalam *et al.*^[23] has reported a very low adherence of 24.1% among hypertensive patients. These studies reported low prevalence and the reason could be socio-demographic differences of the study populations. Some of the factors responsible for adherence to anti-hypertensive medication in the present study were the illiterate population, asymptomatic and presenting with complications. The illiterate population being adherent to anti-hypertensive was found in a study done by Venkatachalam *et al.*^[23] while studies conducted by Raja W *et al.*^[7] and Shiraly *et al.*^[9] have shown illiterate population less adherent to treatment. Illiterate population though do not receive formal schooling tend to understand the seriousness of the complications and take medications regularly and follow the advice of the physician. Hypertensive patients who are asymptomatic have better adherence to medication. This is in confirmation with studies done by Rao

Table 3: Factors associated with adherence to anti-hypertensive medication

	Good (%)	Poor (%)	Chi-square	P
Gender				
Female	53 (63.86)	30 (36.14)	3.646	0.05
Male	76 (76.77)	23 (23.23)		
Family history				
Yes	30 (66.67)	15 (33.33)	0.513	0.473
No	99 (72.26)	38 (27.74)		
Education				
Illiterate	91 (85.85)	15 (14.15)	27.56	<0.001
Literate	38 (50)	38 (50)		
Clinical presentation				
Asymptomatic	83 (78.3)	23 (21.7)	6.77	0.009
Symptomatic	46 (60.53)	30 (39.47)		
Co-morbidities				
Yes	37 (82.22)	8 (17.78)	3.726	0.05
No	92 (67.15)	45 (32.85)		
Complications				
Yes	45 (84.91)	8 (15.09)	7.127	0.007
No	84 (65.12)	45 (34.88)		
Out of pocket expense				
Yes	114 (71.7)	45 (28.3)	0.408	0.52
No	15 (65.22)	8 (34.78)		

Table 4: Factors associated with life-style modifications

	Good (%)	Poor (%)	Chi-square	P
Gender				
Female	55 (72.37)	21 (27.63)	4.2956	0.03
Male	90 (84.91)	16 (15.09)		
Family history				
Yes	30 (66.67)	15 (33.33)	5.61	0.01
No	114 (83.33)	23 (16.67)		
Education				
Illiterate	91 (85.71)	15 (14.29)	6.95	0.008
Literate	53 (70)	23 (30)		
Clinical presentation				
Asymptomatic	99 (86.67)	15 (13.33)	11.01	0.0001
Symptomatic	45 (66.67)	23 (33.33)		
Co-morbidities				
Yes	30 (66.67)	15 (33.33)	5.613	0.01
No	114 (83.33)	23 (16.67)		
Complications				
Yes	92 (71.43)	37 (28.57)	2.723	0.09
No	44 (82.35)	9 (17.65)		
Out of pocket expense				
Yes	124 (78.98)	33 (21.02)		0.789
No	21 (84)	4 (16)		

et al.^[15] Balasubramaniam *et al.*^[16] Mallayya *et al.*^[24] and Mishra *et al.*^[25] The people who are diagnosed by opportunistic screening were asymptomatic at diagnosis. Their health-seeking behaviour is better as they were people who presented to hospital with other symptoms. It gives us an opportunity to explain them regarding the disease, treatment and life-style modifications and possibility of avoiding the onset of complications. In a study conducted by Mohandas A *et al.* in East Delhi,^[26] India has reported that providing

advice to patients regarding the complications of chronic diseases and self-care practices by physicians can improve their practice and ensure adherence. Identifying pre-hypertensive patients allows them to focus on life-style modifications and regular follow-up. In diagnosed, hypertensive patients' helps in counselling patients for adherence to treatment to prevent complications. This opportunistic screening along with reinforcement to therapy and knowing patient perspective has a great advantage in adherence to treatment.

The adherence to life-style modification is 70% in the present study. Lower prevalence was reported from studies by Tibebe *et al.*^[27] and Dhakal *et al.*^[28] which showed an adherence to life style modification as 23% and 20.8%, respectively. This difference could be due to social differences among the study population and the difference in the assessment tool for life style modifications used by the authors. In the present study, most of the study population are labourers whose work style is healthy. Male patients have shown good adherence to life-style modifications. This finding is also seen in the study by Aynalem *et al.*^[29] who have found that male patients have more adherence to life-style modifications. Males usually have usually focus on physical health and cater time towards it. Females have a responsibility of household work, taking care of children. If she is a working parent, she has to work hard and spare time for care of health. Illiterates have shown more adherence to life-style modifications as observed in the present study. A study by Kimani *et al.*^[30] has shown that illiterate population had better understood information related to hypertension and observed the importance of life-style modifications along with medication in controlling the blood pressure.

Most of the patients (87.5%) included in the study were depended on own funds to procure treatment. This was not found to be significant determining factor in the present study, but studies from Malaysia^[31] and Gambia^[32] have shown that poor adherence behaviour to be present among those not provided with free medicines. Authors opined that those who bought medicine from their own funds tend to be irregular with medications and stopped treatment once the BP levels were found normal. Time lag due to delayed procurement of medicines was also another factor leading to poor adherence.

Conclusion

The adherence to medication and life-style modification is satisfactory. However, the determinants of non-adherent patients need attention. Primary care physicians have a key role in opportunistic screening for early detection, treatment and ensuring adherence through proper follow-up. There is a need for ongoing education programmes for treatment adherence and life-style modifications in all hospitals and grass-root level workers should conduct regular IEC activities for hypertensive patients.

Summary and recommendations

- The adherence to medication and life-style modification is satisfactory among hypertensive patients in the urban slums

of Telangana. Prevalence of adherence to medication and life-style modifications being almost 70%.

- The factors found to determine the adherence to medication and life-style modifications of hypertensive patients were gender, education status, family history of hypertension, clinical presentation at the time of diagnosis, presence of other co-morbidities and complications.
- Family physicians working in the primary-care level can play a key role in early detection, treatment and follow-up of hypertensive patients as they are the first point of contact of community with a doctor.
- Opportunistic screening among those above 30 years helps in early detection of hypertension in asymptomatic patients and gives an opportunity to educate them about the importance of adherence to medication and life-style modification to prevent the complications.
- Grass-root level workers like ASHA and Anganwadi workers can also contribute in screening, risk factor identification and imparting proper self-management education to the community.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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