

Assessment of Compliance in Hypertensive and Diabetic Patients at Primary Health Care: A Prospective Study

Jinesh Bahubali Nagavi^{1,*}, Sahana Krishna Kumar¹, Lakshmi Shivamallaiiah², Chandra Sekar Meenakshi³

¹Department of Pharmaceutical Chemistry, Sarada Vilas College of Pharmacy, Krishnamurthy Puram, Mysuru, Karnataka, INDIA.

²Department of Pharmaceutical Chemistry, JSS College of Pharmacy, JSS Academy of Higher Education and Research, Mysuru, Karnataka, INDIA.

³Department of Pharmacy Practice, College of Pharmacy, University of Findlay, 1000 N. Main St., Findlay, Ohio, USA.

ABSTRACT

Background: Recent data in India have identified 77 million people as having diabetes (8.9% prevalence in 20-79 years), and these numbers are expected to increase to 100 million by 2030. Nearly 30% of Indians have hypertension, and only one-tenth of the rural and one-fifth of the urban Indian hypertensive population have their Blood Pressure [BP] under control. Therefore, medication adherence, knowledge and attitude towards disease and patient counselling play a crucial role in the maintenance of the disease condition. **Aims:** To study the effect of clinical pharmacist inclusion for betterment of patient adherence to medication. **Materials and Methods:** A cross-sectional community-based survey was carried out on 100 participants with diabetes and hypertension at primary health centres to assess treatment compliance. A peer reviewed questionnaire was used to collect the details by community pharmacists which included particulars on health records, medications and factors assessing the acquiescence, understanding and perspective towards the disease. Relevant data was transferred into an Excel sheet and results were assessed using SPSS statistical tool. **Results:** Among the 100 patients considered for the study, 43% were diabetic, 37% were only hypertensive and the remaining 20% were both diabetic and hypertensive. Among the study population of diabetic patients, only 43.05% of patients had their blood glucose level under control and only 5% of the hypertensive population had their blood pressure under control. 66% of the selected patients were compliant and the other 34% self-reported partial compliance. **Conclusion:** The most prevalent factors for non-compliance was indolence and most mentioned forgetting to take the medication due to negligence or pre-occupation. Lifestyle modifications performed by over 80% of study patients included-fast walk, yoga and meditation. Around 92% of study population reportedly kept track of their conditions on a regular basis. This study demonstrates the need for clinical pharmacists to be included as an essential member of the healthcare team to improve patient outcomes in India.

Keywords: Anti-diabetic, Anti-hypertensive, Compliance, Hypertension, Diabetes.

Correspondence:

Dr. Jinesh Bahubali Nagavi

PhD, Associate Professor, Department of Pharmaceutical Chemistry, Sarada Vilas College of Pharmacy, Krishnamurthy Puram, Mysuru-570004, Karnataka, INDIA.
Email: nagavi.jinesh@gmail.com

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INTRODUCTION

India is considered the epicenter of the global diabetes mellitus and hypertension pandemic. Over the last four decades, India's diabetes mellitus and hypertension prevalence has skyrocketed due to rapid socioeconomic development and demographic changes, as well as greater susceptibility among Indians.

Treatment of long-term conditions in India has numerous challenges, including a lack of awareness, a scarcity of skilled medical and paramedical employees, and the high cost of medicines and treatments.

Emerging treatment options based on widely accessible assets and technology have the potential to transform the management of diabetic and hypertensive patients in India.¹⁻³

Globally, an estimated 1.28 billion individuals aged 30-79 years have hypertension, with the majority (two-thirds) residing in nations with low or middle incomes. Approximately 46% of the populations with hypertension are unaware that they have a medical condition. Just under fifty percent of the adults (42%) with high blood pressure receive diagnosis and treatment. Approximately one in every five persons (21%) have hypertension under control.⁴

Hypertension can only be detected by having a medical professional examine blood pressure.⁵ The number of individuals with diabetes went up from 108 million in 1980 to 422 million in 2014. Prevalence has increased faster in nations with low or middle incomes than in nations with higher incomes.⁶ Diabetes



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death rates increased by 3% between 2000 and 2019. Diabetes and diabetes-related kidney disease were responsible for around 2 million deaths in 2019.

Type 2 diabetes can be prevented or delayed by eating a balanced diet, engaging in regular exercise, having a normal body weight, and preventing using tobacco products. Diabetes can be effectively managed, and its adverse effects can be prevented with diet, exercise, medication, and routine monitoring and treatment of complications.⁷

MATERIALS AND METHODS

Study Site: Primary health care centres and tertiary hospitals at Mysuru, Karnataka, India.

Study Design: A Prospective observational study.

Study Duration: 4 months.

Study Method

- Data collection form was prepared which includes the demographic details and clinical details of the patient.
- All relevant data required for the study was obtained.
- Data was mentioned in a suitable data collection form.
- Review and collection of cases according to inclusion and exclusion criteria regularly.
- Interpretation of data to generate results.
- Analysis of results to find the final report.

Inclusion Criteria	Exclusion criteria
Adult human males and females.	Patients who require any OTC (Over-the-counter) prescription medication.
Male and Female hypertensive and diabetic patients.	Patients using vitamins, and herbal supplements regularly.
Patients with Body Mass Index (BMI) having 19 to 26.	Patients with a history of significant sensitivity to any drug.
Females with negative results for pregnancy.	Patients with a recent history of drug and alcohol abuse.

Design of Data Collection Form

- Demographic details of the patient.
- Demographic details of primary health centres and tertiary hospitals.
- Clinical details of patients.
- Details about medication consumption and counselling details.

Data Collection Procedure

- A cross-sectional community-based survey was carried out among men and women aged above 18.
- The data was obtained from individual conversations with patients utilizing a pre-tested questionnaire.
- The questionnaire includes specifics on sociodemography, medical data, treatment procedures and factors determining the adherence, understanding and mindset to approach the condition.
- All relevant data for the study was obtained as per the designed data collection form.
- Results were analysed using suitable statistical methods.

Statistical analysis

- The acquired data was evaluated using the SPSS (Statistical Package for Social Science) software.
- The level of statistical significance was determined using one-way Analysis of Variance (ANOVA).

RESULTS

The Proposed work was carried out for 4 months. A total of 100 patients participated in the study (N=100). As per the demographic details from the study, 56% were males (n=56) and 44% were females (n=44). The maximum age of the patients was found to be 96 years, and the minimum age was found to be 35 years. The details of age categorization are represented in Figure 1.

Study patients were enrolled in the following five health care centers. Out of 100 patients, 55 patients (55%) were from secure hospital, 20 patients (20%) were from Shubodaya Hospital, 13 patients (13%) were from Ashwini diabetic and thyroid care centre, 10 patients (10%) were from Swasthya clinic and remaining 2 patients (2%) were from Srinivasa Health Care Centre. The details of the study site distribution are represented in Figure 2.

The frequency of Distribution of both Diabetes and Hypertension patients in the study population includes 43% being diabetic (n=72), 37% being hypertensive (n=61) and the remaining 20% being both diabetic and hypertensive (n=34) which is represented in Figure 3.

Glucose Level in Diabetic Patients

Out of 100 patients, 72 were diabetic 31 patients (43.05%) had a blood sugar level range between 110-149 mg/dL, 17 patients (23.61%) had a range between 150-199 mg/dL, 13 patients (18.05%) had a range between 200-249 mg/dL, 4 patients (5.5%) had a range between 250-299 mg/dL, 5 patients (6.94%) had a

range between 300-349 mg/dL, and 2 patients (2.77%) had a range between 350- 400 mg/dL. The details are represented in Table 1.

Blood Pressure Level in Hypertensive Patients

Out of 100 patients, 3 patients (4.91%) were under the normal category, 19 patients (31.14%) were under the elevated blood pressure category, 17 patients (27.86%) were under the stage 1 category, 18 patients (29.50%) were under stage 2 category, 4 patients (6.55%) were under hypertensive crisis category. The details are represented in Table 2.

Daily Intake of the Medication in a Day: 61 patients (61%) take medicines once a day, 31 patients (31%) take medicines twice a day, and 8 patients (8%) take medicines thrice a day.

Frequency of Number of Medicines Taken at A Time By Patient

50 patients (50%) had one medicine at a time, 40 patients (40%) had two medicines at a time, 5 patients (5%) had 3 medicines at a time and the remaining 5 patients (5%) had 4 medicines at a time.

Medication Skipped by the Study Population: 64 patients (64%) had not skipped their medicines, 2 patients (2%) rarely missed their medicines, 24 patients (24%) had skipped their medicines sometimes and the remaining 10 patients (10%) agreed yes.

Medication Counselling

In the study population, 92% of the patients followed counselling always ($n=92$), and 8% of the patients followed counselling sometimes. ($n=8$).

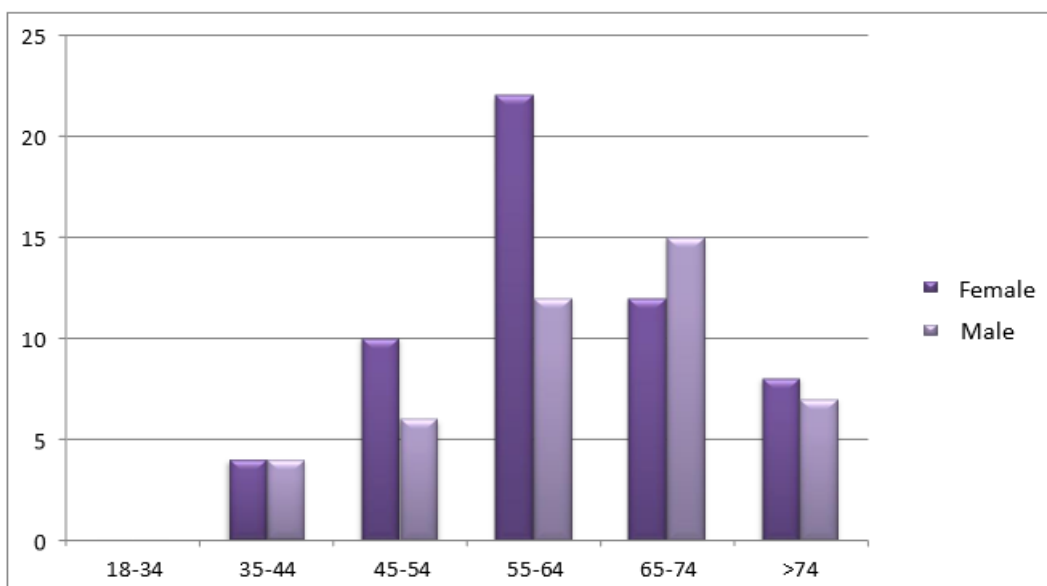


Figure 1: Age categorization in the study population.

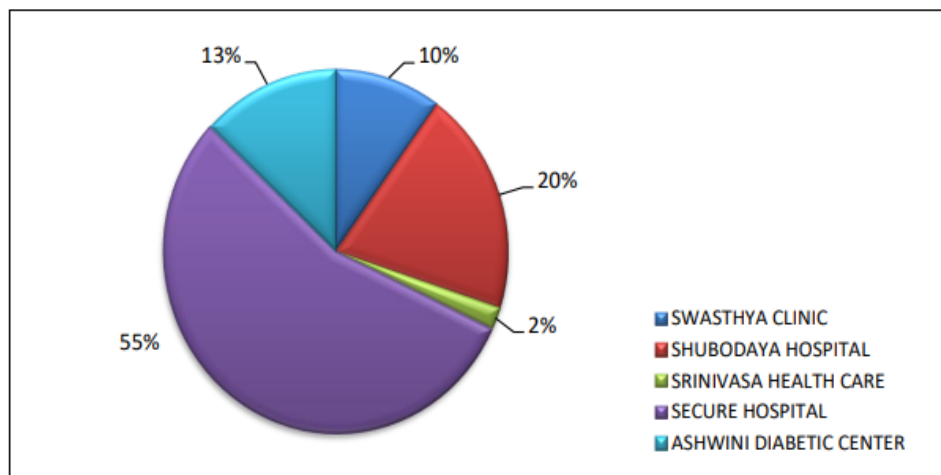


Figure 2: Study site preference.

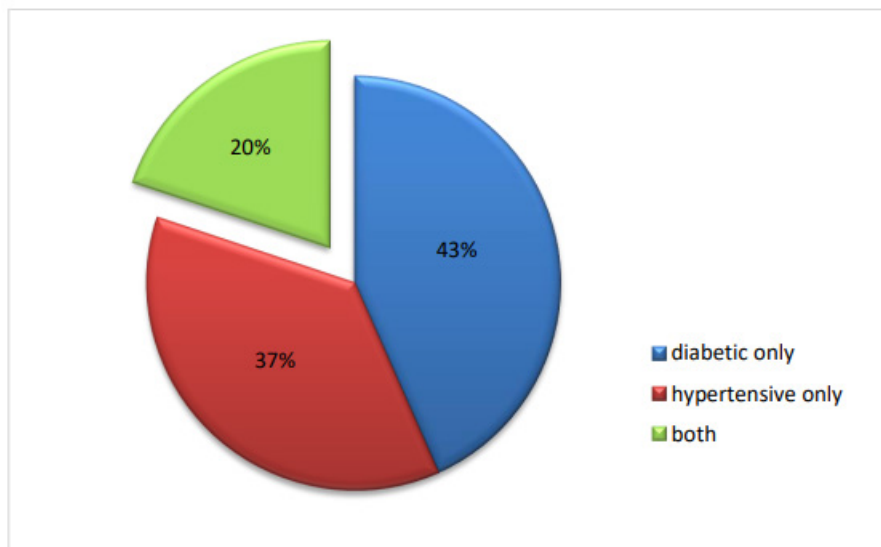


Figure 3: Frequency of both diabetes and hypertension.

Table 1: Blood Glucose level in diabetes patients.

Glucose Level (mg/dL)	Number of Patients	Percentage (%)
110-149	31	43.05
150-199	17	23.61
200-249	13	18.05
250-299	4	5.5
300-349	5	6.94
350-400	2	2.77

Table 2: BP level in hypertensive patients.

Blood pressure Category	Systolic/ Diastolic (mmHg)	Number of Patient	Percentage (%)
Normal	< 120/80	3	4.91
Elevated	120-129 / <80	19	31.14
High blood pressure (stage 1)	130-139 / 80-89	17	27.86
High blood pressure (stage 2)	140 or Higher / 90 or Higher	18	29.50
Hypertensive Crisis	> 180/120	4	6.55

Patients Following the Prescription

93 patients (93%) always followed the prescription, 1% of the patients sometimes followed the prescription, and the remaining 6% of the patients did not at all follow the prescription. The details of the distribution of patients following the prescription are represented in Figure 4.

Lifestyle Changes In Patients

Among 100 patients, 51% of the patients go for walks, 12% of the patients do exercises, 7% of the patients do Yoga, 2% of the patients do meditation and 24% of the patients practice none of these. The remaining 4% of the patients are involved in other physical activities like home chores or other physical work in

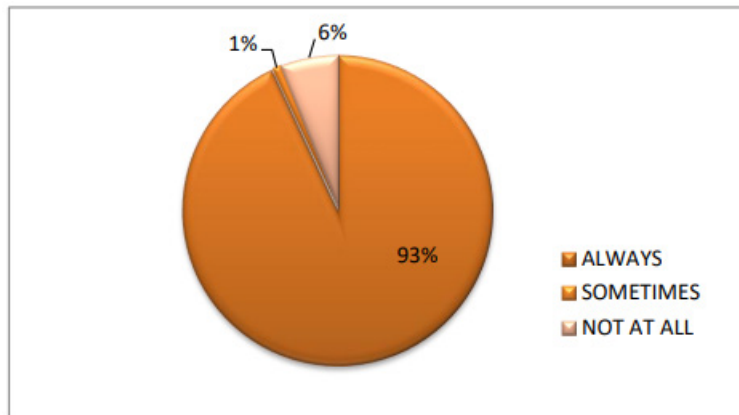


Figure 4: Patients following the prescription.

Table 3: Lifestyle changes in patients.

Changes in their Lifestyle	Frequency	Percentage (%)
Walking	51	51
Exercise	12	12
Yoga	7	7
Meditation	2	2
Physical activities	4	4
None of these	24	24

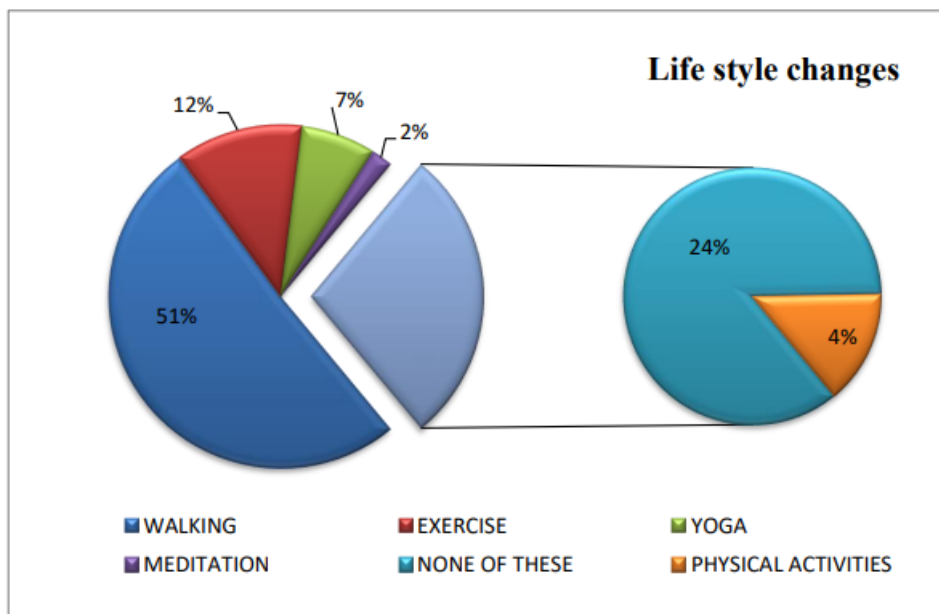


Figure 5: Lifestyle changes in patients.

the fields especially patients from rural areas. The details of the distribution of lifestyle changes in patients are represented in Figure 5 and Table 3.

DISCUSSION

Considering the results obtained from this survey, it is disheartening to find that less than 6% of the hypertensive patient had their Blood Pressure (BP) controlled even though more than 90% of the diseased population claim they follow physician's prescriptions and the recommended directions. Among diabetic patients, only less than 43% of the study populations have their glucose levels under control.

One part of solution to addressing this problem may lie in using our healthcare personnel resources effectively. In 2008, India started granting PharmD degrees for pharmacy students who completed six years of college education and clinical training. This was an important step in enabling clinical pharmacists to improve patient care, however, pharmacists continue to be underutilized members of healthcare teams, simply dispensing drugs instead of working with doctors to optimize patient therapy.

Currently, in India just like in the US 30 years ago, there is a lack of awareness about how pharmacists can contribute to improving patient healthcare outcomes. The "Asheville studies" demonstrated the role of pharmacists in improving patient outcomes, while reducing healthcare costs in the US.⁸ The results were so impressive that the American Pharmacy Association (APhA) foundation launched a "ten-cities diabetes challenge," whose positive outcomes because of pharmacist intervention motivated Medicare to start payments for an annual prescription review by a pharmacist.

According to the World Health Organization (WHO), Indian healthcare faces challenges of inadequate resources, insufficient funding, poor healthcare infrastructure, and rural-urban disparity.⁹ The WHO's data on the distribution of doctors around the world shows that while there are 26.1 doctor per 10,000 patients in US, that number in India is only 7.3 doctors per 10,000 patients for a population of 1.3 billion. When accounted for adequate qualification the number of doctors further drops to 5.0 per 10,000 patients in India.¹⁰ Therefore, India could certainly utilize other well-trained paramedical professionals as part of their healthcare team.

In addition, India's price control on several essential medications has resulted in proliferation of combination products with no additional clinical benefits.¹¹ For example, in the United States the proton pump inhibitor drug called pantoprazole is available under two names: brand name Protonix or as a generic drug pantoprazole. In contrast, the "MedIndia" database lists 386 "brand-names" that contain pantoprazole available to patients in India, often in combination with other drugs with little

clinical benefits. Many of the fixed dose combinations available in India are not even approved by the Central Drug Standards Organization of India.¹² Thus, clinical pharmacists with expertise in drugs are even more relevant in the Indian scenario.

More recently pharmacist intervention leading to better patient outcome reported from developing countries such as South Africa,¹³ Pakistan¹⁴ as well as some smaller studies in the hospital settings from India have appeared in peer-reviewed journals.¹⁵

While the role of pharmacists and their partnering with other healthcare professionals have demonstrated positive patient outcomes in randomized controlled studies in many developed countries there is complete lack of similar studies in India. Randomized controlled studies demonstrating the effectiveness of pharmacist intervention in Indian setting, as well as sharing those results with government, insurance companies, healthcare professionals and patients is the only way to address the current challenge identified in managing hypertension and diabetes in this communication.

CONCLUSION

As per WHO, pharmacists in the community are among the most visible healthcare providers in the general population. Clinical pharmacists provide an interface between the physician and the patient, offering both medications along with complimentary healthcare guidance. This study has shed light on the importance requirement for the involvement of trained pharmacist as part of healthcare team in managing diabetes and hypertension at the healthcare setup.

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ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study does not require ethical approval as it was an observational study. Participants consent was taken prior to the study using a systematic data collection form.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

APhA: American Pharmacy Association; **ANOVA:** Analysis of Variance; **BMI:** Body Mass Index; **BP:** Blood pressure; **OTC:** Over the counter; **SPSS:** Statistical Package for Social Science; **WHO:** World Health Organization.

SUMMARY

In the present study, the results obtained indicated that, among 100 patients who were considered for study, 43% were only diabetic, 37% were only hypertensive and the remaining 20% were both diabetic and hypertensive. Among the study population of diabetic patients, only 43.05% of patients had their blood glucose level under control and only 5% of the hypertensive population had their blood pressure under control. 92% of the population followed patient counselling and 93% of the population followed Physician's prescriptions. Tiredness, headaches, drowsiness, constipation, and dry mouth were common side effects observed by patients after medication consumption. Walking, meditation and yoga were the most likely adopted lifestyle changes for the betterment of the chronic disease condition.

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