

## IMPACT OF PHARMACIST LED HYPERTENSION MANAGEMENT

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## ABSTRACT

**Objective:** The study objective was to analyze the effect of pharmacist interventions in improving blood pressure control.

**Methods:** The prospective interventional study was conducted on a population who were known hypertensive for more than 2 years. They were randomly categorized into two groups, interventional group and usual care group. Pharmaceutical care, involving telephonic follow-up, adherence analysis, patient education was given in the former group in a time interval of 2 months for about 12 months while the later was on regular therapeutical care only. Blood pressure was monitored in each follow-up. The difference in control of blood pressure was measured in terms of mm/Hg unit. The improvement in the measure from start and end of the study was analyzed within the group and between the groups.

**Results:** Lowered blood pressure was observed in both the groups in the end of study. But statistically significant difference was seen in interventional group compared to the other. Involvement of pharmacist led care helped in achievement of AHA goal.

**Conclusions:** Including clinical pharmacist in a health-care team can provide unerring therapeutic regimen to patients thereby their health-care outcome.

**Keywords:** Hypertension, Medication adherence, Clinical pharmacist, Pharmaceutical care, Patient education, Patient counseling, Intervention.

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## INTRODUCTION

Hypertension has become a common chronic disease that needs continuous monitoring and treatment throughout a lifetime [1,2]. Most of the cases remain diagnostic until any complications evolve [3,4]. Hypertension is attributable as the risk factor for cardiovascular disease, heart failure, renal failure, and stroke [5,6]. In India, the incidence of hypertension is increasing hastily, especially in urban areas. Change in lifestyle and diet along with poor awareness and control is regarded as main factors that are influencing the emergence of the condition in high rate [7]. It was established that blood pressure could be managed by exhaustive interventions. Control on blood pressure can be achieved only by blending therapeutic regimen along with the life style modification that can be attained by proper patient education and continuous follow-up.

Mostly elderly people may have comorbid conditions and will be on multiple drug therapy which we call as a complicated regimen which will be difficult for the patients to stick up on [8]. Medication adherence is the key for execution of proper drug effect. Noncompliance to the regimen and to the diet plan will lead to complications associated with chronic disorder that may lead to irreversible damage to the organs associated with it [9]. Cardiovascular disease, renal disease, and neurological deficit are some of it [10]. Even though antihypertensive therapy reduces the risk for cardiovascular disease, a large population of the hypertensive patients were found not treated or insufficiently treated due to the absence of proper compliance with the medications [11]. In general, the antihypertensive treatment fails due to factors like the disease are symptomless in nature, long duration of therapy, complicated regimens, side effects, and above all, lack of knowledge and understanding about the disease and its complications and medication management. Polypharmacy is one of the soul causes of medication noncompliance as well as drug interaction. Together with these obstacles, literacy, poor knowledge about the disease conditions and treatments, and lack of social support become barrier in achieving the target goal of hypertensive management [12].

Interventions focusing on improving the awareness regarding the disease, various specific therapies its problems and the need for adherence turn beneficial [13]. Clinical pharmacists were introduced into the care team mainly to satisfy these objectives [14]. It has been reported that interventions by the pharmacists produced a strong impact on the adherence and improved antihypertensive treatment outcomes. Ongoing and regular follow-up is the only way that can contribute and can be accomplished by rational involvement of pharmacist in patient care [15]. The main objective of the study was to find out the tweak in management of hypertension by the involvement of clinical pharmacist in patient care team [16].

## METHODS

Prospective study was conducted for over a year period after acquiring approval from institutional ethic committee. (Approval no: JMCP/IEC-01A/PD-2018). Patients who were known hypertensive and on treatment for more than 2 years were selected for the study. Exclusion criteria included those who had hepatic and renal disorders or any other critical illness. The patient between 18 years and 70 year of age was selected for the study regardless of the gender. After obtaining informed consent from the participants, they were randomly categorized into two groups, interventional group and control group. Interventional group patients were given special care by a clinical pharmacist in addition to the regular therapy while control group was on usual care.

The intervention group patients were given detailed information about the steps in conduct of study. It involved a multifaceted face to face interview about their disease, medication, regimen, possible side effects, need for adherence, diet control, and exercise. In the beginning of study, for both groups medication adherence level was analyzed using medication adherence rating scale (MARS), the knowledge assessment was done based on QOL questionnaire and the blood pressure was monitored and recorded. In every follow-up period blood pressure was recorded for usual care group while interventional group was on constant observation by the pharmacist. In 12 months, study period every alternative month, follow-up was recommended and all the data

were collected also to improve adherence to medication telephonic follow-up was done. During each session patient was assisted with the regimens and counseling regarding the need for therapy was given. Furthermore, assessment on their adherence was analyzed and contributed to their improvement in compliance. At the end of the study, in both the groups, blood pressure was measured and recorded. The statistical difference of blood pressure within the group at start and end of the study as well as significance between the two groups was analyzed using SAS Software. The demographic data and the baseline characteristics were summarized descriptively. Continuous variables were analyzed using unpaired t test and categorical data were analyzed using the Chi-square test at the baseline as well as by the end of the study at 5% significance.

**RESULTS**

A total of 220 hypertensive patients was selected for the study based on the inclusion and exclusion criteria and their willingness to participate in the studies. At the end of study only 210 participants reported, 104 in control group and 106 in intervention group. Majority of the participants were female and in age group of 56–60 years and was literate (Table 1).

It was found that there were 46.2% in the interventional group and 48% in the usual care group were with graduation and above qualification. It was observed that more than 50% of the participants in both groups were having either higher secondary or graduation. Postgraduates and professionally qualified persons also included in the study. So overall 69% of the participants in the interventional group and in the usual care group were educated above secondary school level.

Smoking and alcoholism were considered as common habits in the society even after all the warning and educations about the complications it may cause, particularly as ageing progress. In the study population, 28.8% were smokers in usual care group and it was 25.5% in the interventional groups. It was reduced to 21.2% and 10.4%, respectively, at the end of the study. The decrease in the interventional group was significant both clinically and statistically.

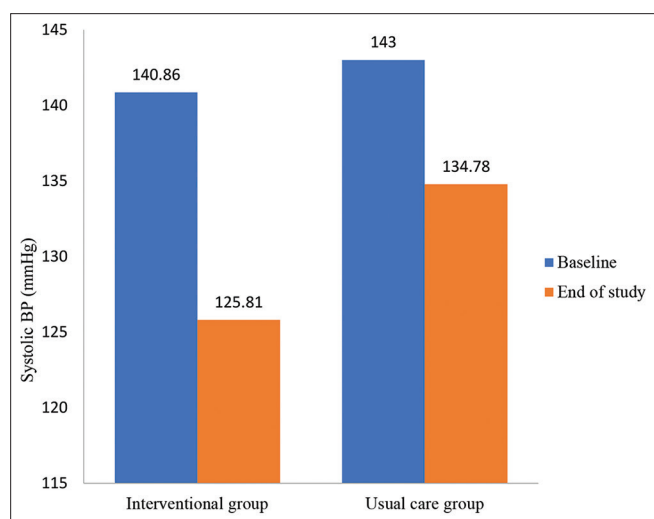
At the baseline there were 35.6% alcoholic patients in the usual care group which was increased to 45.2% at the end of the work. However, patients taking alcohol were 38.7% and 08.5% at the baseline and end

**Table 1: Demographic details**

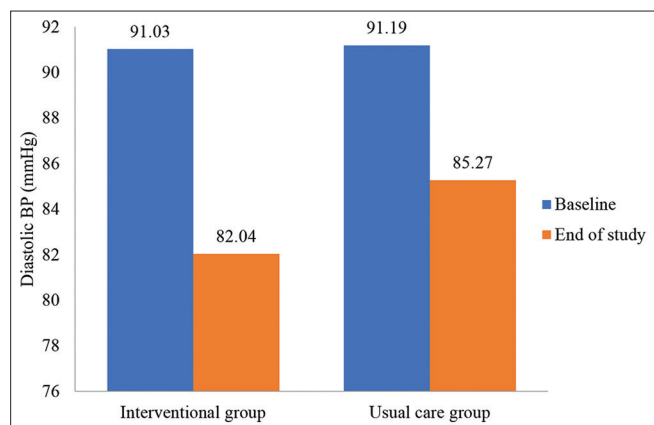
Demographic characteristics	Usual care group N=104	Interventional group N=106	p value
Gender			
Male	44 (42.3)	41 (38.7)	0.592
Female	60 (57.7)	65 (61.3)	
Age group			
41–45	04 (3.8)	03 (2.8)	0.950
46–50	18 (17.3)	19 (17.9)	
51–55	20 (19.2)	21 (19.8)	
56–60	36 (34.6)	38 (35.8)	
61–65	20 (19.2)	21 (19.8)	
66–70	06 (5.8)	04 (3.8)	

of the study, respectively, in the interventional group. The reduction in the interventional patients group as well as between the groups was found statistically significant.

The systolic pressures reduced from 141 mmHg to 126 mm Hg in intervention group and from 142 mm Hg to 134 mm Hg in the usual care group. Similarly, the diastolic pressure decreased from 91 mm Hg to 82 mmHg and from 91 mmHg to 86 mmHg in the interventional and usual care group, respectively. The reduction in the blood pressures in both the groups was significant but the interventional group showed more significant reduction at the end of the study compared to usual care group. The percentage of patients in interventional group achieved the AHA goals for SBP/DBP (140/90) significantly higher than the usual care group in this study (Table 2, Figures 1 and 2).



**Fig. 1: Summary of systolic blood pressure**



**Fig. 2: Summary of diastolic blood pressure**

**Table 2: Outcome measurement of systolic and diastolic blood pressure**

Outcome measures	Interventional group				Usual care group				Group mean difference
	Baseline Mean±SD (Median)	End of study Mean±SD (Median)	Mean difference	p value	Baseline Mean±SD (Median)	End of study Mean±SD (Median)	Mean difference	p value	
Systolic BP (mm Hg)	140.86±5.05 (141.0)	125.81±4.51 (126.0)	15.05	0.00	143.00±6.19 (142.0)	134.78±5.57 (134.0)	8.221	0.001	-6.826
Diastolic BP (mm Hg)	91.03±0.84 (91.0)	82.04±0.25 (82.0)	08.99	0.00	91.19±1.96 (91.0)	85.27±0.35 (86.0)	5.923	0.000	-3.067

## DISCUSSION

Hypertension is nowadays has become a chronic common disease which needs continuous monitoring and treatment throughout the life time in rural, urban areas of the world [1].

In our study, the mean SBP and DBP were higher than high risk levels. In both interventional group and usual care group, the BP levels reduced [2]. The reduction may be due to the increased awareness of the people about the silent nature of the hypertension and associated complications [3]. The increased reduction in the intervention group was due to the interventions of the clinical pharmacists mainly food habits and self-care activities, and reduction in smoking and alcohol habits [4]. Many studies were supported our finding that interventions only can influence the patient for medication adherence and self-care activities as in most cases it is an asymptomatic disease condition until it goes beyond the critical levels [5].

A 6 months study on hypertensive patients showed that there is significant reduction in the systolic as well as diastolic blood pressure with the participation of the pharmacist in treatment group compared to patients who were managed with no pharmacist involvement [6]. Moreover, the pharmacist-controlled treatment group showed significant adherence and exercise control and life style modifications when compared with that of the usual care group.

In the study, the systolic and diastolic blood pressure has shown that positive changes in the baseline to end of study [7]. This study showed that there is a strong influence and positive impact in the patient counseling by clinical pharmacist in drug therapy. The medication adherence also improved in the interventional patients compared to the normal care patients because of patient counseling, PILS, and frequent telephonic follow-ups [8]. The study results also showed that the various factors influencing non-adherence was reduced from baseline to the second follow-up. This indicated the important role of clinical pharmacist on MAB.

In hemodialysis patient's hypertension is highly prevalent and remains still as undertreated condition [9]. A study performed to assess the responsibilities of the clinical pharmacist in the blood pressure monitoring showed that the weekly home blood pressure reached in normal range. In addition to this the study also assessed reduction in blood pressure caused by the peritoneal dialysis, interdialytic increase in the body weight and adherence of the patient to the prescribed drug regimen. The outcomes showed that clinical pharmacist physician collaboration combined effort has improved the management of blood pressure by utilizing home blood pressure monitoring in hemodialysis patients [16]. However, in our study, we did not include any renal disease patients, so it can be considered as a scope that we have to rule out in the future [10].

It was reported that patients with hypertension require more advanced patient counseling and treatment to achieve adequate blood pressure control to achieve betterment in health related quality of life. The pharmacists are found to be in a position to provide patient counseling as an intervention for the objective of achieving positive therapeutic outcomes which will definitely enhance the health associated quality of life of the patient in the health care sector [11]. This study provided how pharmacist mediated patient counseling improved definite clinical outcomes such as knowledge about the progression of the disease, complications if not properly managed and measures required for the control of blood pressure in hypertensive patients. A similar study by the close association of physician and pharmacist to improve blood pressure control was conducted. It was a prospective cluster randomized trial conducted for a period of 6 months. The mean systolic B.P was lowered by about 21 mmHg whereas the mean diastolic BP was lowered by 10 mmHg. It was demonstrated that blood pressure control can be improved when clinical pharmacists directly assist patient management processes. Ultimately, the study results revealed pharmacist mediated patient counseling led to a significant decrease

in systolic blood pressure and diastolic blood pressure as in other studies [12].

It was showed that multi professional team work ensures the safety of the patients. In Brazil, the pharmacists were very much confined to the management of hospital pharmacy services only. But the need for the clinical intervention increased every day. Moreover, many studies reported that pharmacotherapy monitoring by the pharmacist reduce the rate of medication errors. Therefore, a system in which pharmacist reviews the prescription was introduced in Brazil [13]. In hospitals prescription is the main communicating system which ensures the correct dose of the medication. Studies showed that during the prescription and administrative processes medication errors occur. Therefore, it was proposed the pharmacist reported to have a better influence for the proper prescription toward the standard use of medicines. There was electronic prescription system in Brail and moreover pharmacy residence program was also started. These empower the execution of the clinical pharmacy activities for significant improvements in hospital pharmacy for inpatients as well as outpatients' services. In a hospital set up the participation of the pharmacists in daily clinical activities was an essential component in the clinical pharmacy services. The introduction of the clinical pharmacist enabled to identify many drug therapy problems such as drug interactions, drug incompatibilities infusion problems storage issues in the hospital system. The interventions also aimed to find out the presence of inappropriate or unnecessary medication. Moreover, in such patients polypharmacy was practiced due to the comorbid conditions [14]. In all these cases, significant improvement was reported by the intervention of the clinical pharmacists. This was complimented by the high acceptance level of 76% with the clinical pharmacy interventional program.

The clinical services provided by the research pharmacist were effective in the improvement of treatment results to the hypertensive patients. Many studies reported that the services provided by the pharmacist improved health outcomes. A survey conducted in France revealed that pharmaceutical care program produced a beneficial reduction in the elevated blood pressure and the health related standard of life was improved in hypertensive patients. Many positive outcomes were reported in these patients after the implementation of the pharmaceutical care such as more started performing exercise frequently, some discontinued smoking, a few reduced alcohol consumptions, and many have started salt restrictions. However, the interventional group achieved significant changes in the blood pressure management by the improved contact of the pharmacist with the patient. This led to the increased awareness about the disease conditions, medications and the importance of therapy management as well as the patient knowledge on compliance also improved. Studies conducted in many countries demonstrated that the active participation of the pharmacist in the health-care team improved blood pressure control and drug therapy management. Successful implementation of the pharmaceutical care also increased the satisfaction of the patient satisfaction with the activities of the pharmacist for the improvement of their health and quality of life [15].

In a study, following pharmacist intervention lower SBP as well as DBP values were perceived. However, the present reduction observed in the blood pressure was statistically not significant. This was assigned to mean SBP and DBP values at the onset that imparted an overall blood pressure control [16].

## CONCLUSIONS

The present study yielded a significant clinical change in both systolic and diastolic blood pressure in interventional group compared to usual care. Since almost similar antihypertensive class of medications was prescribed to the patients in both groups, the findings pointed out that the interventional strategies like patient education about the therapy and associated improvement in the life style modifications medication

adherence in the interventional group were improved. This resulted in a significant decrease in the blood pressure in the interventional group compared to usual care group.

In this study, both systolic, as well as diastolic values of blood pressure, indicated enhancement in the baseline to the second follow-up and showed that there are a strong influence and positive impact in patient counseling, by a clinical pharmacist, in drug therapy.

#### AUTHOR CONTRIBUTION

The author has actively participated in the research and formulating the manuscript.

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