



RESEARCH ARTICLE

PROMINENCE OF CLINICAL PHARMACIST IN ENHANCING THERAPEUTIC OUTCOMES OF DIABETES WITH HYPERTENSION IN LOW SOCIO-ECONOMIC POPULATION

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ARTICLE INFO

Article History:

Received 19<sup>th</sup> May, 2018  
Received in revised form  
20<sup>th</sup> June, 2018  
Accepted 17<sup>th</sup> July, 2018  
Published online 30<sup>th</sup> August, 2018

Key Words:

Therapeutic Outcomes,  
KAP Questionnaire,  
Drug Related Problems,  
Medication Adherence.

Abbreviations:

DBP : Diastolic Blood Pressure  
FBS : Fasting Blood Glucose  
KAP : Knowledge, Assessment, Practise  
RBS : Random Blood Sugar  
SBP : Systolic Blood Pressure

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DOI: <https://doi.org/10.24941/ijcr.31757.08.2018>

ABSTRACT

**Background:** Clinical pharmacy is a health science discipline whereby pharmacists provide patient care that optimizes medication therapy and promotes health, wellness, and disease prevention. The practice of clinical pharmacy embraces the philosophy of pharmaceutical care; it blends a caring orientation with specialized therapeutic knowledge, experience, and judgment for the purpose of ensuring optimal patient outcomes. This field of pharmacy practice focuses on patient-oriented rather than drug product-oriented service.

**Objectives:**

- To identify drug interactions.
- To identify adverse drug reactions.
- To monitor impact of counselling.
- To improve medication adherence.
- To improve therapeutic outcome for chronic disease patients (Diabetes with hypertension.)

**Method:** The study was conducted from October 2017 to March 2018 in Government General Hospital, Guntur. Patients were recruited in the study based on inclusion criteria. Data was collected by using data collection forms. Questionnaires were given to the patients. Regular follow-ups had been conducted and their laboratory data was recorded. During follow-ups patients were monitored for dispensing errors, prescription errors, dose errors, adverse drug reactions, drug interactions. Counselling had been provided to the patients regarding their medications, diseases, life style modifications. After continuous follow-ups for 3 months (20 days interval), we observed for improvement in knowledge regarding disease and drugs, medication adherence, therapeutic outcomes.

**Results:** 60 patients are included (Diabetes with Hypertension). The mean therapeutic outcome value in Diabetes with Hypertension initially and after follow-ups is 175.88±39.15(FBS), 284.61±73.31(RBS), 152.16±15.95(SBP), 94.16±7.65(DBP) and 161.83±23.95(FBS), 226.15±44.86(RBS), 147.5±12.57(SBP), 92.16±6.13(DBP) respectively. KAP before counselling and after counselling was 55.45±6.41 and 55.45±6.41 respectively. Medication adherence before and after counselling was 32.26±2.29 and 42.51±2.44.

**Conclusion:** By counselling the patients there is an increase in KAP, medication adherence, decrease in DRP's thereby increase in therapeutic outcomes. So, clinical pharmacists are important in enhancing patient care.

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Citation: Sireesha Vimalabathina, Sindhuri Meduru, Prasanthi Ramineni, Suhana Shaik, VenkataRamarao Nallani and D.S. Raju Naidu, 2018. "Prominence of clinical pharmacist in enhancing therapeutic outcomes of diabetes with hypertension in low socio-economic population", *International Journal of Current Research*, 10, (08), 72544-72546.

INTRODUCTION

Pharmacists have extensive clinical knowledge and expertise in the use of medications, and are one of the most approachable of all health care professionals. This makes them uniquely positioned in the health care system to help patients optimize appropriate use of medication, reduce medication related problems and improve health outcomes through the

delivery of pharmacist-provided patient care services, including medication therapy management (MTM), health promotion and education, and disease prevention and mitigation (American pharmacist association, 2008).

MATERIALS AND METHODS

A Prospective Observational cohort study conducted in Outpatient department, government general hospital, Guntur,

Andhra Pradesh. It was conducted in a period of 6 months i.e, between October 2017 to March 2018. Our study population is about 60 patients (Diabetes with Hypertension). Before the commencement of the study the Ethical Committee Permit has been taken. Annexure that were used in our study includes Data collection forms, Alert cards, Patient information leaflets, KAP questionnaires. Patients receiving medications from General Medicine department diagnosed with Diabetes with hypertension were included. Patients from Paediatrics, Gynaecology, Psychiatry, Orthopaedics, Cardiology and age below 12 years and age above 70 years were excluded. Patients were recruited in the study based on inclusion criteria. Data was collected regarding their demographics, personal history, social history, past medical and medication history, laboratory investigations and current medications during the initial follow-up. Questionnaires were also given to the patients. Regular follow-ups had been conducted and their laboratory data was recorded. During follow-ups patients were monitored for dispensing errors, prescription errors, dose errors, adverse drug reactions, drug interactions. Counseling had been provided to the patients regarding their medications, diseases, life style modifications. After continuous follow-ups for 3 months with an interval of 20 days between each follow-up we observed for improvement in knowledge regarding disease and drugs, improvement in medication adherence, improvement in their therapeutic outcomes.

## RESULTS

**Table 1. Assessment of knowledge, attitude and practice**

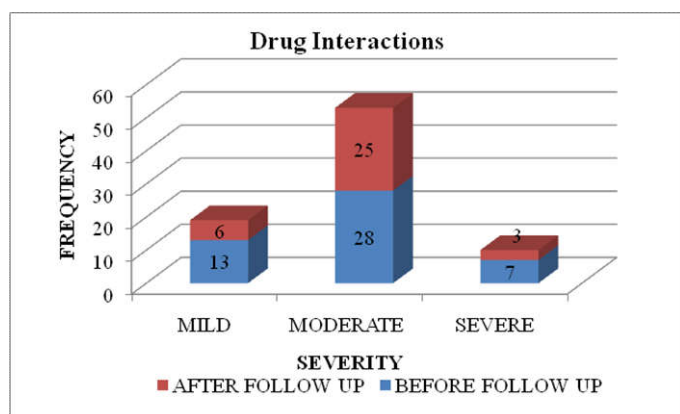
Disease	Mean value		P value
	Initial follow up	Final follow up	
Diabetes with hypertension	55.45±6.41	35.85±1.92	0.000

**Table 2. Assessment of Therapeutic Outcomes for Diabetes with Hypertension Patients**

Variable	Mean value		p Value
	Initial follow up	Final follow up	
Fasting Blood Sugar	175.88±39.15	161.83±23.95	0.000
Random Blood Sugar	284.61±73.31	226.15±44.86	0.000
Systolic BP	152.16±15.95	147.5±12.57	0.03
Diastolic BP	94.16±7.65	92.16±6.13	0.057

**Table 3. Assessment of Medication Adherence of Patients by using Hill-Bone Scale**

Disease	Mean value		P value
	Initial follow up	Final follow up	
Diabetes with hypertension	32.26±2.29	42.51±2.44	0.000



**Table 4. Proportion of Severity of Potential Drug Interactions out of Total Drug Interactions**

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S.No	Drug interactions	Initial follow up	Final follow up
1	Total number of drug-drug interactions	48	34
2	Mild drug-drug Interactions	13	6
3	Moderate drug-drug Interactions	28	25
4	Severe drug-drug interaction	7	3

**Table 5. List of ADR's detected**

S.No	Drug	Adverse drug reaction	Frequency
1	Iron supplements	Black stools (malena)	10
2	Enalapril	Cough	30
3	Amlodipine	Edema	9
4	Telmisartan	Upper respiratory tract infection	11
5	Amoxycylav	Diarrhoea	6
6	Aspirin	Gi bleeding	6
7	Atorvastatin	Rhabdomyolosis	4
8	Metformin	Hypoglycemia	15
9	Glimeperide	Hypoglycemia	23

## DISCUSSION

An observational study on 'Prominence of Clinical Pharmacist in Enhancing Therapeutic Outcomes of Diabetes with Hypertension in Low Socio-Economic Population'. The patients were recruited based on inclusion and exclusion criteria and had follow ups for 6 months. In this study, pharmacists counsel regarding the prescribed medicines, medication adherence, life style modifications, at initial follow-ups and results were being observed for 5 follow ups. This study is also intended to evaluate the impact of pharmacist in improving knowledge, attitude, practice and medication compliance and therapeutic outcomes. Ethical committee permission was taken before commencement of the study. All the statistical analysis was calculated by using SPSS software. Pharmacotherapeutic outcomes of subjects were monitored during the study and were compared from the initial to final follow up which coincides with the study conducted by Sanni *et al.*, study on Role of pharmacist counselling in pharmacotherapy quality improvement (Yaldasani *et al.*, 2016). In patients with diabetes and hypertension Fasting Blood Sugar was decreased from 175.88 to 161.83 with a standard deviation of 39.15 and 23.95 respectively with P value of 0.000 at 95% confidence interval and Random Blood Sugar decreased from 284.61 to 226.15 with a standard deviation of 73.31 and 44.86 respectively with P value of 0.000 at 95% confidence interval and their Systolic BP was decreased from 152.16 to 147.5 with a standard deviation of 15.95 and 12.57 respectively with P value of 0.03 at 95% confidence interval and Diastolic BP was decreased from 94.16 to 92.16 with a standard deviation of 7.65 and 6.13 respectively with P value of 0.057 at 95% confidence interval which coincides with Marie smith, a study on Pharmacists' Role in Improving Diabetes Medication Management (Smith, 2009). and with Pranay Wal *et al.*, study on Pharmacist involvement in the patient care improves outcome in hypertension patients (Pranay Wal *et al.*, 2013). As the study is conducted in government sector, most of the patients do not have adherence to medications, patients were improved in their adherence when compared to the initial follow up to final follow up by educating and counselling by the pharmacist. This coincides with Francesca Elaine Soto Santiago and Kyle Melincon a study on Impact of Clinical Pharmacist Intervention on Medication Adherence and Disease related Knowledge among Patients with Low Health Literacy in Puerto Rico (Francesca Elaine Soto Santiago and Kyle Melincon, 2015). KAP

questionnaires were used to assess the patient's knowledge regarding the disease, medication and life style adaptations they have to follow to control their morbid conditions and improve their quality of life. This study coincides with Mounica. Bollu *et al.*, a study on Study of Knowledge, Attitude, And Practice of General Population of Guntur Toward Silent Killer Diseases: Hypertension And Diabetes (Mounica *et al.*, 2015). Individual questionnaires were prepared for Diabetes, Hypertension. Results were compared between baseline and final follow up by assessing the scores. This is similar to the study conducted by Mallesh *et al.*, on Evaluation of the Clinical Pharmacist Role in a Health Care Team; a Comparative Approach (Mallesh *et al.*, 2016). For Hypertension KAP questionnaire consists of 13 questions. Responses from the patients were taken and significance was calculated. Significance is calculated at the baseline and final follow up and P value is 0.000. This study coincides with Shakti Shrestha, *et al.*, study on Knowledge, Attitude and Practice on Hypertension among Antihypertensive Medication Users (Shrestha *et al.*, 2016). For Diabetes KAP questionnaire consists of 27 questions. Responses from the patients for questions were taken and significance was calculated. Significance is calculated at the baseline and final follow up and P value is 0.000. This is similar to the study Mounica. Bollu, Study of Knowledge, Attitude, And Practice Of General Population Of Guntur Toward Silent Killer Diseases: Hypertension And Diabetes (Mounica *et al.*, 2015).

### Conclusion

The current study shows that the majority of the patients had a poor knowledge about the diseases and self-medications and decreased therapeutic outcomes. Firstly the clinical pharmacist should educate the patients regarding the diseases and medications. Secondly pharmacist should check for medication adherence thereby enhanced therapeutic outcomes can be observed. Thirdly identifying the drug related problems. These three measures would definitely increase the therapeutic outcomes and helps in increasing the quality of life of the patient. Finally by regular follow-ups Adverse Drug Reactions, Drug Interactions, Dispensing Errors and Prescription Errors can be monitored. So, clinical pharmacist services are essential for the better patient care.

**Acknowledgement:** We wish to express heartfelt thanks to Dr. S.Raju Naidu, MD., RT, Superintendent, Govt. General Hospital, Guntur for his support and freedom of conducting our work in the particular assigned wards and for the timely completion of our project. We profusely thank Principal, Prof. Rama Rao Nadendla M. Pharm., Ph D., F.I.C Chalapathi Institute of pharmaceutical Sciences, for providing essential facilities and encouragement given to us during the project work.

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