



## IMPLEMENTATION AND EVALUATION OF PHARMACEUTICAL CARE SERVICES AT A TERTIARY CARE HOSPITAL IN ANDHRA PRADESH

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### ARTICLE IN

### ABSTRACT

#### Key Words

Drug Related Problems,  
Clinical Pharmacist,  
Internal Medicine,  
Pharmaceutical Care, Co-  
morbidities, Interventions



Clinical pharmacy introduces a significant change from the drug-oriented profession to a patient-centred pharmaceutical care approach. It involves the responsible provision of drug therapy to achieve optimal outcomes that improve the patient's quality of life (Hepler and Strand, 1990). The objective of this study is to signify the effect of a structured communication strategy on the acceptance rate of clinical interventions made by a clinical pharmacist and implementing ward-based clinical pharmacy services targeting the patients at high risk of drug-related problems. A total of 120 Drug-Related Problems were identified in 218 subjects. Interventions recommended to all the DRP's out of which 13 recommendations were accepted, and therapy changed. In our study, Drug interactions were the most common drug-related problems observed, followed by untreated indications (16.66%), Adverse drug reactions and others. Of the total 120, DRP's the level of significance 'Minor' was found to be high (60.83%) followed by 'Moderate' (36.66%) and 'Major' (2.5%). The acceptance rate of intervening pharmacist suggestions is found to be 53.33%. Out of 53.33% of interventions accepted, 10.83% of interventions led to changes in drug therapy.

## INTRODUCTION

Clinical pharmacy is a health sector discipline in which pharmacists provide patient-related care that optimizes medication therapy, promotes health, wellness, and disease prevention.<sup>1</sup> SHPA standards for Practice for clinical pharmacy have been developed for all patient care and adapted for use in a variety of practice settings, with aiming to ensure the highest possible quality of patient care.<sup>2</sup>

While stating that clinical pharmacists should assume responsibility and accountability for achieving therapeutic goals and needs. The definition makes it clear that they are called upon to be more than consultants.<sup>3,4,5</sup> Clinical pharmacists are involved in direct interaction with, and observation of, the patient. Besides, it is noted that clinical pharmacists practice both independently and in consultation or collaboration with other health care professionals.

Geriatrics refers to medical care for elderly patients, an age group that is not easy to define precisely. Ageing (i.e., pure ageing) refers to an inevitable and irreversible decline in organ function, that occurs over time even in absence of injury, illness, environmental risks, or poor lifestyle choices (e.g., unhealthy diet, lack of exercise, substance abuse).<sup>22</sup> The age-related Pharmacokinetic and Pharmacodynamic changes might affect drug therapy and drug use in the elderly. Drug interactions are more frequent in elderly patients because more medications are taken.<sup>20</sup>

A drug-related problem (DRPs) is defined as ‘an event or circumstance involving drug therapy that *actually or potentially* interferes with health outcomes.<sup>4</sup> DRPs may be identified and solved as a part of conducting medication reviews, which in practice, are often performed by clinical pharmacists in collaboration with physicians.<sup>13</sup>

**✚ List of Classifications:**

- Hepler–Strand classification
- Cipolle/Morley/Strand classification
- Granada consensus
- Hanlon approach
- Krskaet al. System
- Mackie classification

Among the above classifications, we have followed Hepler and strand classification as it considers all criteria present in other classifications.

**Hepler–Strand classification (1990)<sup>13</sup>**

An event or circumstance involves a patient's drug treatment that interferes actually or potentially with the achievement of an optimal outcome.

In this classification, the DRPs are classified as follows:

- i. Untreated indications
- ii. Improper drug selection
- iii. Sub therapeutic dosage
- iv. Failure to receive drugs

- v. Over dosage
- vi. Adverse reactions
- vii. Drug interactions
- viii. Drug use without indication.

An intervention is defined as any recommendation made by the clinical pharmacist to a healthcare professional, about drug therapy, which aims to improve the quality of medication use.

**According to SHAP guidelines<sup>2</sup>**

Level	Descriptor	Description
1	Minor	Minor injuries, minor treatment required, no increased length of stay or re-admission, minor financial loss.
2	Moderate	Major temporary injury, increased the length of stay or re-admission, cancellation or delay in planned treatment or procedure. Potential for financial loss.
3	Major	Major permanent injury, increased the length of stay or re-admission, morbidity at discharge, the potential for significant financial loss.

**METHODOLOGY:** The prospective-interventional study was carried out over six months from August-2018 to January-2019 in a tertiary care hospital in Andhra Pradesh. Ethical clearance to conduct the study was obtained from the Institution Ethics Committee.

**Study criteria**

**Inclusion criteria** are 1) Hospitalized patients 2) Both the gender 3) Those are willing to participate in our study.

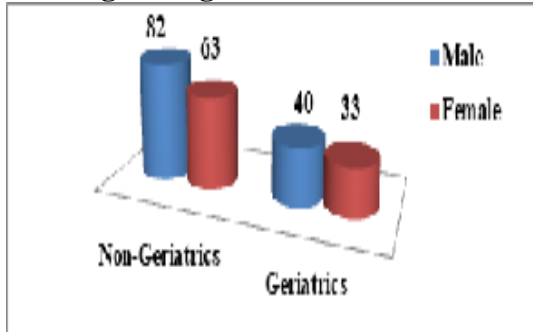
**Exclusion criteria** are 1) Those are not willing to participate in our study. 2) Pregnant during the hospitalization period.

**Method of data collection**

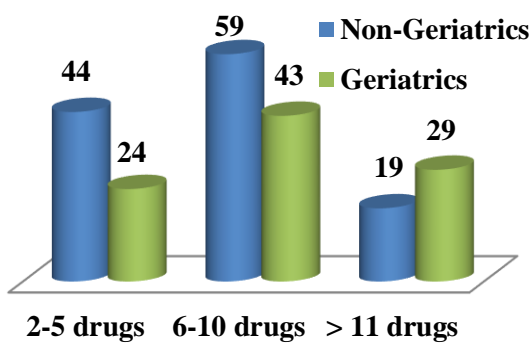
Daily regular rounds are carried out in the study site during the study period. The data is collected and recorded in a specially designed data entry format. Before data collection, Explanation of pharmaceutical care plan to the patient/bystander is obtained through a physician. A patient/bystander is also well informed about the study; its objective etc. The study populations were divided into two groups: Geriatrics and Non-Geriatrics.

**RESULTS**

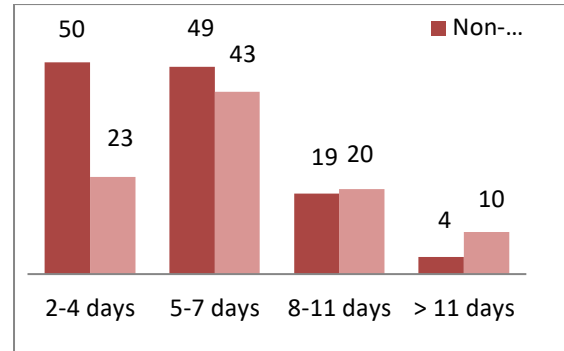
**Age and gender distribution**



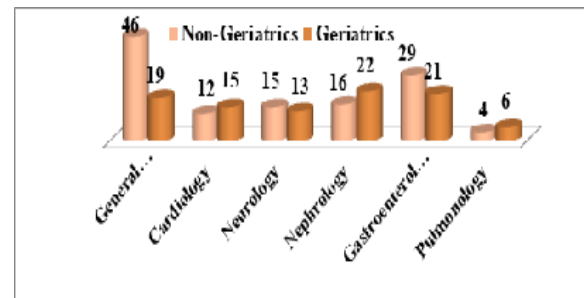
**Distribution based on Number of Medications:**



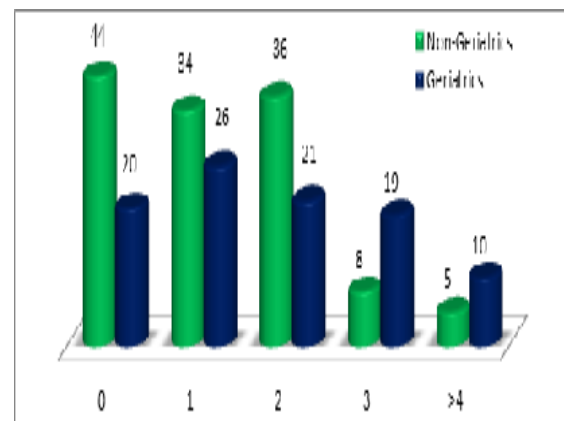
**Length of hospital stay**



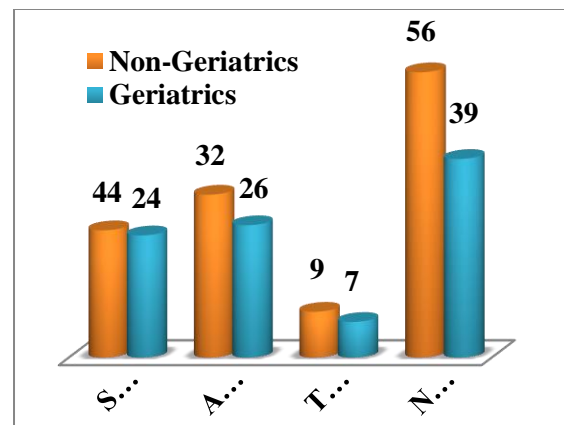
**Department wise distribution**



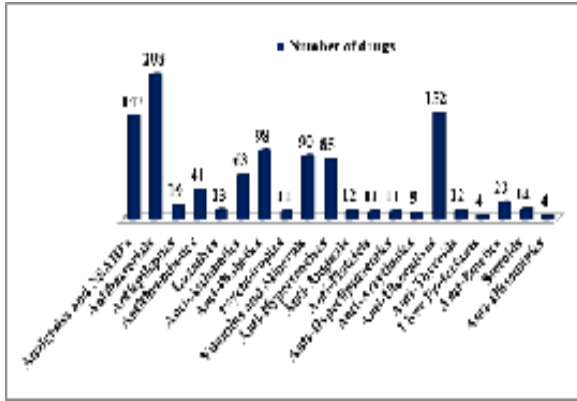
**Number of Co-morbidities**



**Number of Social Habits**



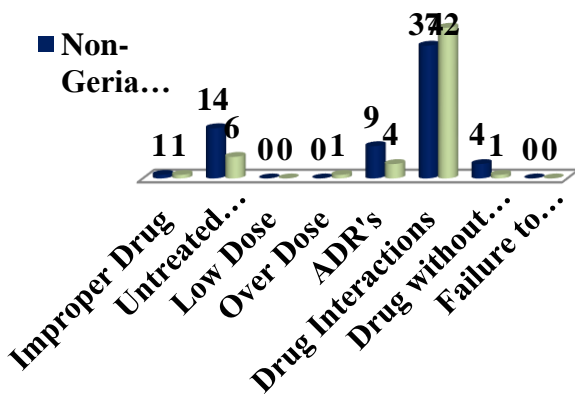
**Distribution based on Class of drugs**



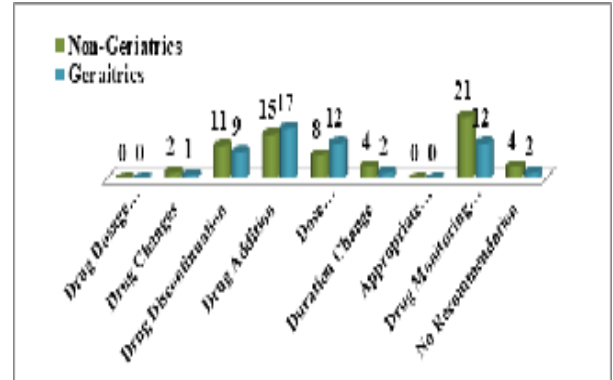
Number of Queries Collected

Correlation Comparative parameter with DRP's [Geriatrics and Non geriatrics] (n=89)	Mean ±S.D	95% CI	p value (<0.05)
Age	51.19 ±18.70	47.25 - 55.13	< 0.0001*
No. of medications	8.85±3.06	8.20-9.49	< 0.001*
Length of stay	5.97±2.31	5.49-6.46	< 0.0001*
No. of co-morbidities	0.38±1.19	-0.233-0.300	0.80

Types of Drug Related Problems (Based on Hepler and Strand Classification)

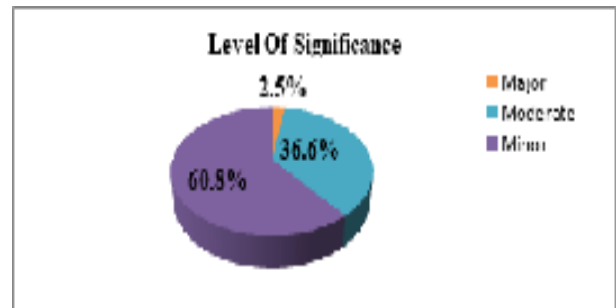


Clinical Pharmacist Recommendations



Significance Level of DRP's

S.No	Status of Enquirer	Mode of reply		Total (%) (n=73)
		Written	Verbal	
1	Physician	36	7	43 (58.90)
2	Nursing Staff	9	6	15(20.54)
3	Pharmacist	5	2	7(9.58)
4	Others (Patient)	-	8	8(10.95)



Statistical Analysis using SPSS 20.0

Multi-Variable Analysis between different variables using Two Way Anova

DISCUSSION

Identification and resolving the drug-related problems in the prescriptions is the core activity in pharmaceutical care. The study was undertaken to identify DRP's and to evaluate the clinical significance of each DRP, similar to that of Adusumilli PK et al., (2014)<sup>14</sup>. The study subjects are subjected into two groups, Non-Geriatrics and Geriatrics. The results of the present study indicated that geriatric patients

experienced the highest number of DRP's than adults despite the number of admitted old patients which was lesser of the total patients than that of adult patients admitted. Generally, individual groups easily identified and comparison of the impact of pharmaceutical care services. Similar findings were observed in Barry L. Carter, 2016.<sup>8</sup> The males were predominant over females. Similar results have also been obtained in studies conducted by Ganachari et al., (2010), which showed an increase in the number of male population than females. Length of Hospital stays overall highest rate is around 5-7 days. Co-morbidity is the presence of one or more additional conditions co-occurring with a primary condition. This one of the relative risk factor for enhancing the drug-related problems. In our study Out of 218 subjects presented with more than four co-morbidities and with no co-morbidities. The social environment plays a critical role in determining the likelihood that an individual will use drugs or will develop a drug use disorder. In our study, high impact on alcoholic followed by smokers and tobacco habits. It was concluded that a total of 1029 drugs were prescribed to our study subjects. Among them, the most prescribed drugs are Anti-bacterial, Analgesics and NSAID's and Proton pump inhibitors. A total of 73 drug information queries were collected. Out of which physician have more interaction towards patient care. Counselling is an important part of pharmaceutical care to influence patient behaviour and adherence. In our study, out of 218 subjects, 186 subjects were counselled.

The identified DRP's were classified as per HEPLER and STRAND Classification. Drug interactions were the most common drug-related problems observed, followed by untreated indications (16.66%), adverse drug reactions and others. This observation was in contrast with the study conducted by Celin et al. (2012)<sup>19</sup>. Among all 120

recommendations, Drug monitoring is a recommendation is a high impact followed by drug addiction in our study. The intervening pharmacist will access the clinical significance of each intervention. Of the total 120, DRP's the level of significance 'Minor' was found to be high (60.83%) followed by 'Moderate' (36.66%) and 'Major' (2.5%).

The Acceptance Level for each intervention is recorded as either accepted or not accepted. Similarly, whether drug therapy changed or not changed. The acceptance rate of intervening pharmacist suggestions is found to be 53.33%. Out of 53.33% of interventions accepted, 10.83% of interventions led to changes in drug therapy. The remaining 42.5% recommendations were accepted, but the therapy was not changed. In 46.66% cases, the suggestions were neither accepted nor drug therapy changed. In some cases, we couldn't convey our interventions to the physician at the appropriate time due to their busy schedule. The main reason for the non-acceptance was prescription alteration or cancellation due to the alteration of patient health status; similar results were identified and reported by Barbara J. Courtman, 2005.<sup>21</sup>

## **CONCLUSION**

This study demonstrates the positive impact of Clinical Pharmacists in identification and resolution of Drug-Related Problems, which improved the patient's health-related outcomes by routine Clinical Pharmacist Review of in-patient drug therapy and Interventions. The provision of pharmaceutical care has the potential to improve the quality of pharmacotherapy and save medical costs and improve the patient's quality of life. We have collected 218 cases. Among them, 120 DRP's were identified. Of them, three major, 44 moderate and 73 minor DRP's were found. An increasing number of DRP's may cause a different type of consequences in patients; it may increase

the cost of drug therapy due to prolong hospitalization and also decrease patient safety and health care outcomes. As a pharmacist to provide the Pharmaceutical Care to the patient in rational is likely to have had beneficial outcomes.

#### **ACKNOWLEDGMENT**

We are so grateful to Dr. Charan Tej.K, Medical superintendent, Manipal hospital, Vijayawada, and also Dr. Manoj Kumar , department of General medicine, Manipal hospital, Vijayawada, for their continue support.

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