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'Case Study On Pharmacist Intervention In Reducing Medication Related Problem In Elderly Patient'

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ABSRACT

Medication-related problems (MRPs) are highly prevalent among elderly patients due to polypharmacy, multiple chronic diseases, physiological changes associated with aging, and poor medication adherence. Pharmacist intervention plays a vital role in identifying, preventing, and resolving MRPs, thereby improving therapeutic outcomes and quality of life in geriatric patients.

The present case study was conducted to evaluate the role of pharmacists in reducing medication-related problems in elderly patients admitted to a tertiary care hospital. The study included elderly patients aged 60 years and above who were receiving multiple medications for chronic diseases such as hypertension, diabetes mellitus, cardiovascular disorders, chronic kidney disease, and respiratory illnesses.

The pharmacist interventions included medication review, identification of drug interactions, dose adjustments, patient counseling, monitoring adverse drug reactions, improving adherence, and communicating with physicians regarding therapy modifications. Various medication-related problems such as unnecessary drug therapy, inappropriate dosing, duplication of therapy, adverse drug reactions, drug interactions, and non-compliance were identified.

The results demonstrated that pharmacist interventions significantly reduced medicationrelated problems and improved patient understanding, medication adherence, and therapeutic outcomes. The study concluded that clinical pharmacists play a crucial role in geriatric healthcare by optimizing medication therapy and enhancing patient safety.

Aging is a natural biological process associated with progressive physiological, psychological, and functional changes that affect overall health and quality of life. The global geriatric population is increasing rapidly due to improved healthcare systems, better disease prevention strategies, and increased life expectancy. Elderly patients are more vulnerable to chronic illnesses such as

hypertension, diabetes mellitus, cardiovascular diseases, chronic kidney disease, arthritis, respiratory disorders, and neurological conditions. Management of these chronic diseases often requires long-term use of multiple medications, commonly known as polypharmacy. Polypharmacy significantly increases the risk of medication-related problems (MRPs), adverse drug reactions (ADRs), drug-drug interactions, medication nonadherence, therapeutic duplication, and hospitalization.

Medication-related problems are among the major challenges faced in geriatric healthcare and are considered an important cause of morbidity and mortality worldwide. Elderly patients experience age-related physiological changes that influence the pharmacokinetics and pharmacodynamics of drugs. Reduced renal and hepatic function, altered body composition, decreased protein binding, impaired cognition, and poor vision contribute to inappropriate medication use and increased susceptibility to adverse drug events. In addition, elderly patients frequently consult multiple healthcare providers, resulting in complex medication regimens and lack of proper medication monitoring.

The present study was undertaken to evaluate the impact of pharmacist intervention in identifying, preventing, and reducing medication-related problems in elderly patients. The study was conducted in a tertiary care hospital using a prospective observational case study design. Elderly patients aged 60 years and above receiving multiple medications for chronic diseases were included in the study. Patient information was collected from hospital case records, medication charts, laboratory reports, physician notes, and patient interviews. The collected data included demographic details, disease conditions, medication history, laboratory investigations, and medication adherence patterns.

Keywords: Elderly patients, Medication-related problems, Pharmacist intervention, Polypharmacy, Adverse drug reactions, Medication adherence.

INTRODUCTION

The elderly population is rapidly increasing worldwide due to improvements in healthcare services and increased life expectancy. Aging is associated with physiological, psychological, and social changes that influence the pharmacokinetics and pharmacodynamics of medications.

Elderly patients commonly suffer from multiple chronic illnesses requiring long-term pharmacotherapy. As a result, they are at increased risk of medication-related problems (MRPs), adverse drug reactions (ADRs), drug-drug interactions, therapeutic duplication, and medication non-adherence.

The elderly population is increasing rapidly throughout the world as a result of advances in medical science, improved healthcare facilities, better nutrition, immunization programs, and increased awareness regarding disease prevention. Aging is considered a natural and irreversible biological process associated with progressive decline in physiological functions and increased vulnerability to various chronic diseases. According to the World Health Organization (WHO), individuals aged 60 years and above are considered elderly or geriatric patients. The growing geriatric population has created significant challenges for healthcare systems due to increased prevalence of chronic diseases and the need for long-term pharmacotherapy.

Elderly patients commonly suffer from multiple disease conditions such as hypertension, diabetes mellitus, cardiovascular disorders, arthritis, chronic kidney disease, respiratory illnesses, osteoporosis, neurological disorders, and gastrointestinal diseases. Management of these conditions often requires the use of multiple medications simultaneously, a condition known as polypharmacy. Polypharmacy is highly prevalent among geriatric patients and significantly increases the risk of

medication-related problems, adverse drug reactions, drug interactions, medication errors, and poor therapeutic outcomes.

Medication-related problems (MRPs) are defined as any undesirable event experienced by a patient that involves or is suspected to involve drug therapy and interferes with achieving the desired therapeutic goals. MRPs are a major public health concern and are associated with increased morbidity, mortality, prolonged hospitalization, and healthcare expenditure. Elderly patients are particularly susceptible to medication-related problems because of age-related physiological changes affecting drug pharmacokinetics and pharmacodynamics.

Physiological changes associated with aging include decreased renal and hepatic function, reduced cardiac output, changes in body fat composition, decreased gastrointestinal absorption, altered plasma protein binding, and impaired homeostatic mechanisms. These changes affect drug absorption, distribution, metabolism, and excretion, making elderly patients more sensitive to medications and adverse drug effects. Cognitive impairment, poor vision, hearing difficulties, depression, and memory loss further complicate medication management in geriatric patients.

METHODOLOGY

Study Design

The present study was conducted as a **prospective observational case study** to evaluate the effectiveness of pharmacist intervention in identifying, preventing, and reducing medicationrelated problems (MRPs) in elderly patients. The study focused on real-time assessment of medication use, detection of drug-related problems, and implementation of clinical pharmacist recommendations to improve patient outcomes.

Study Setting

The study was carried out in the **General Medicine Department** of a tertiary care teaching hospital. Both inpatient and outpatient geriatric patients were included to ensure comprehensive evaluation of medication use patterns and associated problems in different clinical settings.

Study Duration

The study was conducted over a defined period as per institutional academic requirements. During this period, continuous monitoring and follow-up of selected elderly patients were performed to assess medication therapy and outcomes after pharmacist intervention.

Study Population

The study population included elderly patients aged 60 years and above who were receiving treatment for one or more chronic diseases and were prescribed multiple medications. Patients with polypharmacy were specifically targeted due to their higher risk of medicationrelated problems.

Inclusion Criteria Patients aged 60 years and above Patients receiving five or more medications (polypharmacy cases)

- Patients diagnosed with chronic diseases such as hypertension, diabetes mellitus, cardiovascular disorders, chronic kidney disease, and respiratory diseases
- Patients attending inpatient or outpatient departments
- Patients willing to participate in the study and provide consent
- Patients with complete medical and prescription records available

Exclusion Criteria

- Patients below 60 years of age
- Critically ill patients requiring emergency life-support measures
- Psychiatric patients with severe cognitive impairment or inability to communicate
- Patients unwilling to participate in the study
- Patients with incomplete or missing medical records

Data Collection Procedure

Data were collected systematically using a combination of direct and indirect methods. Information was obtained from:

- Patient case records
- Prescription charts
- Laboratory investigation reports Nursing and physician notes
- Patient and caregiver interviews

A structured data collection form was used to record demographic details, disease conditions, medication history, and laboratory values. Patient interviews were conducted to assess medication adherence, understanding of therapy, and presence of adverse drug reactions.

Evaluation of Medication-Related Problems

Medication-related problems were identified and categorized based on clinical assessment and established guidelines. The following types of MRPs were evaluated:

- Untreated medical conditions
- Improper drug selection
- Overdose or subtherapeutic dosing
- Adverse drug reactions
- Drug–drug and drug–disease interactions
- Therapeutic duplication
- Medication non-adherence
- Lack of appropriate monitoring

DETAILED CASE STUDY OF ELDERLY PATIENT

5. CASE PRESENTATION

1 Patient Information

- **Patient Name:** Nagu Rathod
- **Age:** 72 years
  - *Gender: Male* *Weight: 66 kg*
- **Height:** 168 cm
- **BMI:** 23.4 kg/m²
- **Occupation:** Retired farmer
- **Residence:** Rural area

2 Chief Complaints

The patient was admitted with the following complaints:

- Generalized weakness
- Dizziness
- Shortness of breath on exertion
- Swelling in both legs (pedal edema)
- Frequent urination
- Poor appetite

3 Present Medical History

The patient is a known case of multiple chronic diseases and was on long-term medication. He reported worsening fatigue and dizziness over the past few weeks. He also complained of irregular medication intake due to confusion in drug schedule.

4 Past Medical History

- Type 2 Diabetes Mellitus (12 years)
- Hypertension (15 years)
- Chronic Kidney Disease (Stage 3)
- Ischemic Heart Disease (5 years)
- Osteoarthritis (knees)

5 Family History

- No significant hereditary disease reported
- Father had hypertension
- Mother had age-related arthritis

6 Social History

Non-smoker

Occasional alcohol consumption in past (stopped 5 years ago)

Diet: Mixed diet, high carbohydrate intake

Physical activity: Low

7 Medication History (Before Pharmacist Intervention)

S. No	Drug Name	Dose	Frequency	Indication
1	Metformin	500 mg	BD	Diabetes
2	Glimepiride	2 mg	OD	Diabetes
3	Amlodipine	5 mg	OD	Hypertension
4	Atenolol	50 mg	OD	Hypertension

5	Furosemide	40 mg	OD	Edema
6	Aspirin	75 mg	OD	Cardiac protection
7	Diclofenac	50 mg	BD	Osteoarthritis pain
8	Atorvastatin	10 mg	OD	Hyperlipidemia
9	Pantoprazole	40 mg	OD	Gastric protection

8 Laboratory Investigations

Test	**Result**	**Normal Range**
Fasting Blood Sugar	198 mg/dL	70–110 mg/dL
Postprandial Blood Sugar	276 mg/dL	<140 mg/dL
HbA1c	8.6%	<6.5%
Serum Creatinine	2.0 mg/dL	0.6–1.2 mg/dL
Blood Urea	58 mg/dL	15–40 mg/dL
Hemoglobin	10.5 g/dL	13–17 g/dL
Potassium	3.1 mEq/L	3.5–5.0 mEq/L
Blood Pressure	158/92 mmHg	120/80 mmHg

MEDICATION-RELATED PROBLEMS IDENTIFIED

In the case of the elderly patient **Nagu Rathod (72 years)**, a detailed medication review by the clinical pharmacist revealed several medication-related problems (MRPs) affecting treatment outcomes and patient safety.

1. Polypharmacy

The patient was prescribed **9 different medications** for multiple chronic conditions including diabetes, hypertension, CKD, and ischemic heart disease. This increased the risk of drug interactions, adverse drug reactions, and poor adherence.

2. Drug–Drug Interaction → *Aspirin + Diclofenac*
→ Increased risk of gastrointestinal bleeding and gastric irritation →

Multiple antihypertensive drugs together
→ Risk of hypotension if not properly monitored

3. Inappropriate Drug Use

Diclofenac was prescribed despite the patient having **chronic kidney disease (CKD stage 30)**

→ NSAIDs may worsen renal function and fluid retention

4. Adverse Drug Reaction (ADR) → *Furosemide-induced hypokalemia*
→ Serum potassium was low (3.1 mEq/L) causing weakness and dizziness → Possible NSAID-related renal stress and edema worsening

5. Medication Non-Adherence
Patient reported **missing doses frequently** due to confusion in medication timing Complex regimen led to poor understanding of therapy schedule

RESULTS AND DISCUSSION

1 Results

After the implementation of pharmacist interventions in the elderly patient **Nagu Rathod (72 years)**, notable improvements were observed in medication safety, disease control, and patient understanding.

1. Improvement in Clinical Parameters

Parameter	Before Intervention	After Intervention
Blood Pressure	158/92 mmHg	134/82 mmHg
Fasting Blood Sugar	198 mg/dL	142 mg/dL
Postprandial Blood Sugar	276 mg/dL	168 mg/dL
Serum Potassium	3.1 mEq/L	4.0 mEq/L
General Symptoms	Weakness, dizziness	Improved significantly

2. Reduction in Medication-Related Problems (MRPs)

- Initial MRPs identified: Multiple (polypharmacy, drug interactions, inappropriate NSAID use, non-adherence)

- After pharmacist intervention: **Significant reduction in preventable MRPs** Unsafe medication (diclofenac) was successfully discontinued

3. Improvement in Medication Adherence Before intervention: Poor adherence due to confusion and complex regimen After intervention: **Marked improvement in adherence** due to:

- Medication chart preparation
- Patient counselling
- Simplified dosing schedule

4. Reduction in Adverse Drug Effects

- Dizziness and weakness reduced after correction of hypokalemia
- No further NSAID-related complications observed
- Gastrointestinal risk significantly reduced after stopping diclofenac

PREVENTION OF MEDICATION ERRORS IN ELDERLY PATIENTS

Medication errors are common in elderly patients due to polypharmacy, multiple chronic diseases, reduced cognitive function, and age-related physiological changes. These errors can lead to adverse drug reactions, hospitalizations, treatment failure, and increased healthcare costs. Therefore, prevention strategies are essential to ensure safe and effective drug therapy in geriatric patients.

1. Regular Medication Review

Frequent medication review by clinical pharmacists helps in:

- Identifying unnecessary medications
- Detecting duplicate therapy
- Removing high-risk drugs
- Optimizing treatment regimens

2. Medication Reconciliation

Medication reconciliation should be performed at:

- Admission
- Transfer between wards
- Discharge

This helps prevent:

- Omission of drugs
- Duplication
- Incorrect dosing

CONCLUSION

The present case study on pharmacist intervention in reducing medication-related problems in elderly patients clearly demonstrates that elderly individuals are highly vulnerable to drug-related complications due to polypharmacy, multiple chronic diseases, age-related physiological changes, and poor medication adherence.

In this case, the patient **Nagu Rathod (72 years)** was receiving multiple medications for conditions such as diabetes mellitus, hypertension, chronic kidney disease, and ischemic heart disease. During the medication review, several medication-related problems were identified, including inappropriate drug use (NSAID in CKD), drug–drug interactions, electrolyte imbalance, poor glycemic control, and medication non-adherence.

Clinical pharmacist intervention played a significant role in identifying, resolving, and preventing these problems. Important interventions included medication review, discontinuation of inappropriate drugs, dose optimization, management of drug interactions, correction of electrolyte imbalance, patient counseling, and preparation of a simplified medication schedule. Regular monitoring and communication with the physician further improved the quality of care.

After pharmacist intervention, there was a marked improvement in the patient's clinical condition, including better control of blood pressure and blood glucose levels, correction of hypokalemia, reduction in adverse drug effects, and improved medication adherence. The patient also showed better understanding of his treatment regimen, leading to improved self-care and compliance.

REFERENCES

1. Cipolle RJ, Strand LM, Morley PC. *Pharmaceutical Care Practice: The PatientCentered Approach to Medication Management*. McGraw-Hill.
2. Strand LM, Morley PC. Drug-related problems: their structure and function. *Pharm World Sci*.
3. Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. *Am J Hosp Pharm*.
4. Hanlon JT, Schmader KE. The medication appropriateness index in elderly patients. *J Clin Epidemiol*.
5. Beers MH. Explicit criteria for determining potentially inappropriate medication use in older adults. *Arch Intern Med*.
6. World Health Organization (WHO). *Medication Safety in Polypharmacy*. WHO Report.
7. World Health Organization (WHO). *Ageing and Health*.
8. Katzung BG. *Basic and Clinical Pharmacology*. McGraw-Hill.
9. Goodman & Gilman. *The Pharmacological Basis of Therapeutics*. McGraw-Hill.

Dipiro JT et al. *Pharmacotherapy: A Pathophysiologic Approach*. McGraw-Hill.