

Drug Interaction Risks in Geriatric Patients: Review of Prescription Patterns and Potential Drug-Drug Interactions in Elderly Patients with Multiple Comorbidities

1. Introduction

The aging population in Pakistan is growing rapidly, with an estimated 10 million individuals aged 60+ — a number expected to double by 2050. With aging comes an increased burden of **chronic diseases** such as hypertension, diabetes, arthritis, and cardiovascular disorders, leading to **polypharmacy** (use of 5+ medications). This study reviews **prescription patterns** in geriatric patients and evaluates the prevalence of **potentially harmful drug-drug interactions (DDIs)** in clinical practice across hospitals and clinics in southern Punjab, particularly Rahim Yar Khan.

2. Objectives

- To assess the prevalence of polypharmacy among elderly patients (aged 60+) in outpatient and inpatient settings.
- To identify the most commonly prescribed drug combinations.
- To screen for potential drug-drug interactions using standardized tools (e.g., Micromedex, Liverpool DDI Checker).
- To evaluate the knowledge and prescribing practices of physicians regarding geriatric pharmacotherapy.
- To recommend strategies for safer medication management in older adults.

3. Methodology

Study Design: Retrospective and cross-sectional review of medical records and prescription audits.

Duration: 8 months

Study Sites: Medical wards and outpatient departments of district hospitals and private clinics in Rahim Yar Khan, Muzaffargarh, and Dera Ghazi Khan.

Sample Size: 500 patient records of individuals aged 60+ with two or more comorbidities.

Data Collection:

- Review of prescriptions for medications (name, dose, frequency, duration).
- Documentation of comorbidities (e.g., diabetes, heart disease, CKD).
- Screening for DDIs using the ****Liverpool Drug Interaction Database**** and ****Micromedex®****.
- Survey of 30 physicians on prescribing habits and DDI awareness.

Definitions:

- **Polypharmacy:** ≥ 5 medications
- **Potentially Severe DDI:** High risk of adverse effects (e.g., bleeding, arrhythmia, renal failure)

Analysis: SPSS for descriptive statistics; DDI severity classified as major, moderate, or minor.

4. Expected Findings

- **High Polypharmacy Rate:** >60% of elderly patients will be on 5+ medications.
- **Common Combinations:**
 - Atorvastatin + Amlodipine + Metformin + Aspirin + Omeprazole
 - Warfarin + NSAIDs (e.g., diclofenac) → High bleeding risk
 - Insulin + Beta-blockers → Masked hypoglycemia
- **Significant DDIs:** 30–40% of patients will have at least one major drug interaction.
- **Physician Awareness Gap:** Only 40% of doctors routinely check for DDIs before prescribing.
- **High-Risk Pairs:**
 - ACE inhibitors + NSAIDs → Acute kidney injury

- Metformin + Iodinated contrast → Risk of lactic acidosis

5. Significance in the Pakistani Context

This research addresses a critical but overlooked patient safety issue. In Pakistan:

- Geriatric medicine is an underdeveloped specialty.
- Patients often consult multiple doctors without coordinated care.
- Pharmacists rarely review prescriptions for interactions.
- Over-the-counter NSAIDs and herbal supplements increase DDI risk.

Findings will support the **Pakistan Medical Commission (PMC)** and **Punjab Health Department** in promoting:

- Use of DDI screening tools in electronic prescribing
- Geriatric-focused continuing medical education (CME)
- Polypharmacy reduction protocols

This study will also inform the development of a **National Geriatric Medication Safety Guideline**.

6. Ethical Considerations

Patient data will be anonymized. The study will be reviewed by the RYKMDC Institutional Review Board (IRB). No personal identifiers will be published. Physician surveys will be voluntary and confidential.

7. Budget Estimate (Total: PKR 190,000)

Item	Estimated Cost (PKR)
Data Collection & Medical Record Review	50,000
Field Staff (Research Assistant, Pharmacist)	60,000
DDI Software Access & Analysis	30,000
Physician Survey & CME Workshop	30,000

Data Analysis & Final Report	20,000
Total	190,000

8. Conclusion

Polypharmacy and drug interactions are silent threats to the health and safety of elderly patients in Pakistan. This study will provide the first comprehensive assessment of prescription patterns and DDI risks in geriatric care within southern Punjab. By identifying high-risk combinations and gaps in physician awareness, we can advocate for safer prescribing practices, integrate DDI screening into clinical workflows, and ultimately reduce hospitalizations and improve quality of life for older adults.

Note: This research aligns with WHO's Patient Safety Strategy and supports Sustainable Development Goal 3.8 (Universal Health Coverage and Safe Medication Use).

© RYKMDC Research Repository. All rights reserved.

Contact: info@rykmdc.online | +92 300 6740295