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**Research Article**

# Assessment Of Prescription Quality, Legibility, and Error Prevalence in a Tertiary Care Teaching Hospital: A Cross-Sectional Study

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**ABSTRACT**
Background: Medication errors present a major challenge in global healthcare, causing preventable morbidity and prolonged hospital stays. This study evaluated prescription-writing standards, clinical disease profiles, and error patterns in a tertiary care hospital.
Methods: A cross-sectional, observational audit of 50 representative inpatient prescription sheets was conducted across general medicine, surgery, orthopedics, and gynecology wards. Data parameters assessed patient demographics, primary diagnoses, compliance with prescription writing guidelines, and specific error categories.
Results: The patient cohort showed a high concentration of elderly individuals (60–80 years), with males comprising 60.0% and females 40.0%. Leading primary diagnoses included cardiovascular/comorbid conditions (22.0%), upper gastrointestinal bleeding (18.0%), and respiratory tract infections (16.0%). While handwriting legibility was 100% and treatment duration documentation reached 92.0%, compliance with block-letter formatting was 60.0%, and generic drug prescribing was exceptionally low at 16.0%. Overall, prescription errors were detected in 12.0% of records, evenly divided (4.0% each) among wrong dosing, incorrect frequency, and unclear or non-standard abbreviations.
Conclusion: Although physical legibility is well-maintained, heavy reliance on brand names and incomplete adherence to standardized writing practices highlight critical vulnerabilities. Implementing regular audit-and-feedback cycles, mandating generic drug nomenclature, and reinforcing standardized prescription training are vital to minimizing medication errors and improving patient safety.

**Keywords:** Prescription Audit, Medication Errors, Inpatient Wards, Rational Drug Use, Tertiary Care Hospital, Generic Prescribing.

## INTRODUCTION

Medication errors constitute one of the most critical challenges facing global healthcare systems, contributing significantly to patient morbidity, prolonged hospital stays, increased healthcare expenses, morbidity and mortality. The World Health Organization (WHO) emphasizes that rational medicine use requires that patients receive medications appropriate to their clinical needs, in doses that meet their individual requirements, for an adequate period, and at the lowest cost to them and their community (1)

Prescribing errors occur during the decision-making process or written communication of a prescription order, leading to a reduction in treatment efficacy or an increased risk of adverse drug reactions(1,2). In tertiary care facilities, complex pharmacotherapeutic regimens involving multi-morbidity in elderly populations markedly increase the likelihood of prescribing discrepancies. Multi-drug regimens prescribed under trade/brand names rather than International Nonproprietary Names (INN) further compound risks of therapeutic duplication, drug interactions, and dispensing mistakes.

(3,4)
Although institutional guidelines mandate clear, legible, and standardized prescription practices—including block-letter formatting, explicit dosage instructions, and generic drug nomenclature—compliance across clinical departments remains variable (7). Evaluating prescription quality through audit cycles is important for identifying vulnerabilities in clinical workflows. Therefore, this study aimed to evaluate demographic patterns, clinical disease profiles, adherence to prescription writing standards, and the nature of prescription errors within a tertiary care hospital setting(8).

## MATERIALS AND METHODS

### Design and Setting

This cross-sectional, observational audit was conducted in the inpatient wards of General medicine, General surgery , Orthopedics and Gynecology at a tertiary care teaching hospital. The study protocol was reviewed and approved by the Institutional research board and Ethics Committee.

### Data Collection and Parameters

A total of 50 representative inpatient prescription sheets were audited using a customized abstraction form. Parameter evaluation encompassed:

- **Demographics & Clinical Profile:** Patient age, gender, and primary clinical diagnoses (e.g., acute pulmonary edema, upper GI bleeding, COPD, CKD, peripheral vascular gangrene).
- **Prescription Standards Compliance:** Assessment of handwriting legibility, write-up in capital letters, usage of generic drug names vs. trade/brand names, and explicit documentation of treatment duration.
- **Prescription Error Categories:** Identification of dosing errors (over-dosage or under-dosage), incorrect dosing frequency, and unapproved medical abbreviations.
- **Pharmacotherapeutic Profile:** Documentation of prescribed drug classes including cardiovascular agents, antiplatelet/anticoagulant drugs, antimicrobial agents, gastroprotective agents, neuroprotective/anti-dementia formulations, and osmotic diuretics.

### Statistical Analysis

Descriptive statistics were computed using Python Continuous variables (such as age) were summarized using counts and distribution ranges, while categorical variables (gender, compliance metrics, error classifications, diagnoses) were presented as absolute frequencies (***n***) and percentages (***%***).

## RESULTS

### Patient Demographics and Clinical Diagnostics

The patients showed a marked concentration in the elderly demographic, with the highest frequency of inpatient admissions falling within the 60–80 year age group (Figure 1). Male patients comprised 60.0% while female patients constituted 40.0% (Figure 2).

Figure 1: Age Distribution Histogram Showing Major Patient Concentration in the 60–80 Year Age Range.

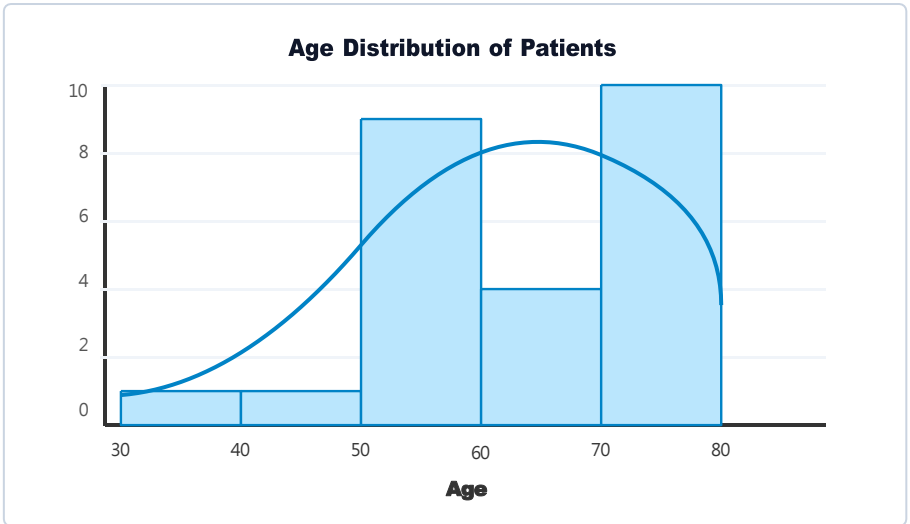



Figure 2: Gender Breakdown of Study Participants (60.0% Male Vs 40.0% Female).

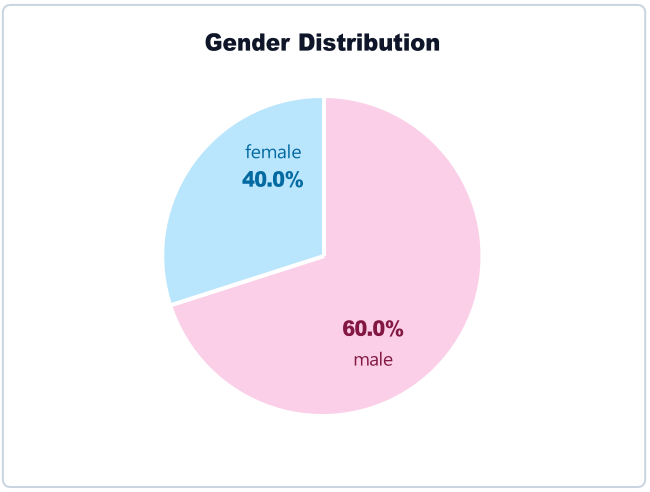


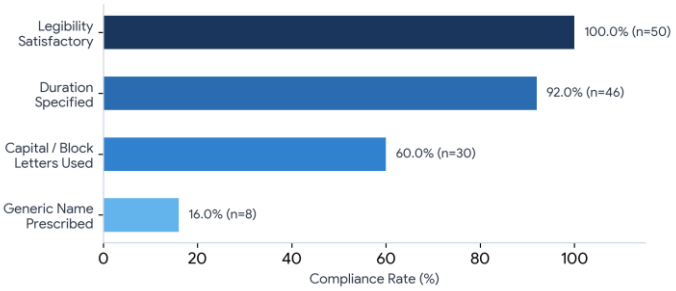

Table 1: Frequency Distribution of Primary Inpatient Clinical Diagnoses

| Primary Clinical Diagnosis | Percentage (%) | Primary Therapeutic Classes Utilized |
|---|---|---|
| Other Cardiovascular / Comorbid Conditions (HT, CHD) | 22.0% | Antiplatelets (Ecosprin, Clopilet), Statins (Atorvastatin), Beta-Blockers |
| Upper Gastrointestinal Bleeding | 18.0% | Proton Pump Inhibitors (Pantoprazole), Hemostatics |
| Respiratory Tract Infection (RTI) | 16.0% | Broad-Spectrum Antibiotics (Amoxicillin-Clavulanate, Azithromycin), Antipyretics |
| Chronic Obstructive Pulmonary Disease (COPD) | 12.0% | Corticosteroids (Hydrocortisone), Bronchodilators, Antibiotics |
| Acute Pulmonary Edema | 10.0% | Osmotic Diuretics (Mannitol), Loop Diuretics, Vasodilators |
| Urinary Tract Infection (UTI) | 10.0% | Fluoroquinolones (Ciprofloxacin, Levofloxacin), Nitrofurantoin, Urinary Analgesics |
| Chronic Kidney Disease (CKD) | 6.0% | Renoprotective Agents (Nefrosave), Antihypertensives |
| Gangrene Foot Ulcer | 6.0% | Broad-Spectrum Antibiotics (Ceftriaxone, Clindamycin) |

Analysis of admission diagnoses revealed high cardiovascular, respiratory, and acute gastrointestinal disease burdens among the study population. Other cardiovascular and comorbid conditions (HT, CHD) were the most common primary diagnoses (n=11, 22.0%), followed by upper gastrointestinal bleeding (n=9, 18.0%), respiratory tract infections (RTI, n=8, 16.0%), chronic obstructive pulmonary disease (COPD, n=6, 12.0%), acute pulmonary edema (n=5, 10.0%), urinary tract infections (UTI, n=5, 10.0%), chronic kidney disease (CKD, n=3, 6.0%), and gangrene foot ulcer (n=3, 6.0%).

**Adherence to Standard Prescription Writing Guidelines**

Figure 3: Prescription Compliance Indicators (N = 50)




Evaluation Prescription compliance indicators demonstrated mixed findings regarding quality standards (Figure 3). Legibility was satisfactory in 100% (n=50) of evaluated sheets. Specification of treatment duration was documented in 92.0% (n=46) of instances. However, adherence to block letter writing was observed in only 60.0% (n=30) of cases. Most strikingly, compliance with generic prescribing guidelines was low, with only 16.0% (n=8) of prescriptions using nonproprietary generic names.

**Medication Profile and Brand Reliance Analysis**

Prescription audits identified widespread reliance on brand/trade names across major drug classes. High-frequency medications documented in the patient records included:

- **Antiplatelet & Cardiovascular Agents:** Ecosprin (Aspirin), Clopilet (Clopidogrel), Atorstat (Atorvastatin), Carvedilol, and osmotic/diuretic agents (Mannitol).
- **Antimicrobial Therapy:** Ceftinaacine / Ceftriaxone (Parenteral 3rd generation cephalosporin) and Clindamycin.
- **Gastroprotective & Corticosteroid Agents:** Pantop (Pantoprazole) and Hydrocort (Hydrocortisone).
- **Renal & Neurological Support Formulations:** Nefrosave (Alpha-Lipoic Acid / Amino Acid / Renoprotective combinations) and Admenta (Memantine).

**Analysis And Classification of Prescription Errors**

Overall, 88.0% (n=44) of analyzed prescriptions were classified as error-free regarding procedural
dosage instructions (Figure 4). However, prescription errors were detected in 12.0% (n=6) of records.

Each identified error category contributed 4.0% (n=2) to the overall dataset:

-Wrong Dosing Errors (4.0%, n=2): Inappropriate initial dosage assignment relative to renal function
or baseline severity.

- Wrong Frequency Errors (4.0%, n=2): Ambiguous interval timing for parenteral anti-infectives or
diuretics.

- Unclear / Non-Standard Abbreviations (4.0%, n=2): Utilization of unapproved acronyms for complex drug combinations.

Figure 4: Breakdown of Identified Prescription Error Types (

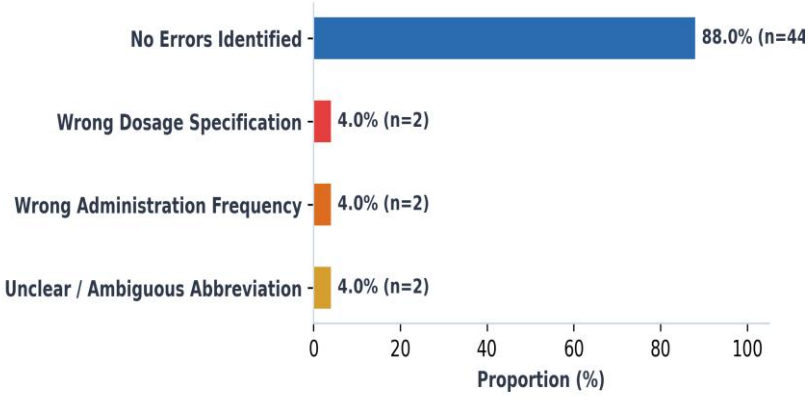



Table 2: Breakdown and Typology of Identified Prescription Errors (N = 50)

| | | | |
|---|---|---|---|
| **No Errors Identified** | 44 | 88.0% | Optimal therapeutic baseline |
| **Wrong Dosage Specification** | 2 | 4.0% | Sub-therapeutic efficacy or systemic toxicity risk |
| **Wrong Administration Frequency** | 2 | 4.0% | Fluctuating steady-state serum drug levels |
| **Unclear / Ambiguous Abbreviation** | 2 | 4.0% | Nursing misinterpretation & dispensing errors |

## DISCUSSION

The present study assessed inpatient prescription-writing practices in a tertiary care teaching hospital and demonstrated both satisfactory compliance and areas requiring improvement. Legibility was satisfactory in all prescriptions (100%), while treatment duration was documented in 92%. However, compliance with block-letter writing was only 60%, and the use of generic names was particularly low at 16%. The predominance of elderly patients and those with multiple cardiovascular, respiratory, gastrointestinal and renal conditions highlights the importance of clear and individualized prescribing practices.

Prescription errors were identified in 12% of the audited prescriptions. These included wrong dosage, incorrect dosing frequency and unclear or non-standard abbreviations, with each category accounting for 4% of prescriptions. Dose-related errors are particularly important in patients with renal impairment, where inappropriate dosing may increase the risk of toxicity or inadequate therapeutic response. Similarly, unclear abbreviations and dosing intervals may result in misinterpretation during dispensing or medication administration.

The widespread reliance on brand names and incomplete adherence to standardized prescription-writing practices indicate scope for improvement in medication safety. Regular prescription audits, feedback to prescribers, training in rational prescription writing, increased use of generic names and avoidance of ambiguous abbreviations may help reduce preventable prescribing errors. Periodic re-auditing could also help assess the effectiveness and sustainability of such interventions in the hospital setting.

## CONCLUSION

This inpatient audit underscores that while foundational standards such as physical legibility and treatment duration documentation are well-maintained within tertiary care, critical vulnerabilities persist. The heavy reliance on brand names—manifested in only 16% generic prescribing—combined with a low adherence to block-letter formatting, elevates the latent risk of therapeutic duplication and dispensing mistakes. These procedural gaps are particularly hazardous given the concentrated elderly demographic managing complex multi-morbidity profiles.

The identification of prescription errors in 12% of audited records, equally distributed among incorrect dosages, flawed administration frequencies, and ambiguous abbreviations, highlights specific targets for clinical governance. In vulnerable populations dealing with conditions like chronic kidney disease, acute pulmonary edema, and upper gastrointestinal bleeding, even minor dosing or timing discrepancies can precipitate severe adverse drug reactions, systemic toxicity, or sub-therapeutic failures.

Mitigating these systemic risks requires institutional commitment to structured, continuous quality improvement frameworks. Integrating regular audit-and-feedback cycles, mandating International Nonproprietary Name (INN) utilization, and reinforcing training on standardized prescription nomenclature will protect patients and foster safer, more rational pharmacotherapeutic practices across hospital wards.

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