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Research Article

Prospective Observational Study On Medication Reconciliation And Admission Discrepancies In A Hospital

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ABSTRACT

Medication reconciliation, a crucial process in healthcare, involves comparing a patient's medication orders with their existing medications to avoid discrepancies and enhance patient safety. This prospective observational study explores the significance of medication reconciliation during admission, aiming to categorize and assess the severity of medication discrepancies for a period of 6 months at a Tertiary Care Hospital in Mangalore and included 600 participants out of which 255 met inclusion criteria. The study revealed that only 255 patients had medication discrepancies. Most patients were aged above 60 years (55.29%), emphasizing the vulnerability of geriatric individuals to chronic diseases. Analyzing comorbidities showed that patients with 2 comorbidities (47.84%) was predominant. 63.52% of prescriptions contained 1-5 medications, with polypharmacy increasing the likelihood of discrepancies. Medication discrepancies were categorized as intentional during admission (53.23%) and unintentional (46.76%). Drug omission was the most common unintentional discrepancy (45.15%), followed by altered route (19.57% during admission) and altered dose (17.05%). Severity classification revealed that the majority of errors belonged to category C (52.54%), indicating errors reaching the patient but not causing harm. The present study shows that medication reconciliation is essential for reducing medication errors and enhancing patient safety. The study's findings advocate for the implementation of robust medication reconciliation protocols across all healthcare facilities, with an emphasis on utilizing the expertise of pharmacists and pharmacy students. By doing so, healthcare systems can ensure optimal patient outcomes and improve overall healthcare quality

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INTRODUCTION

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) defines medication reconciliation as comparing a patient's current medications to new orders to identify discrepancies. Medication errors pose significant safety risks and financial burdens in hospitals. Medication reconciliation reduces these errors, classified by the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) to gauge their severity and implement preventive measures. Obtaining an accurate Best Possible Medication History (BPMH) at admission is crucial for patient safety.[1] The American Society of Health-System Pharmacists (AHSP) advocates for the pharmacist's role in medication reconciliation [2]. In recent studies, the pharmacist's involvement in medication reconciliation at admission was shown to decrease the number of medication errors, improve patient safety, and reduce costs associated with health resource utilization [3]. Studies proved that pharmacy students and technicians are accurate and efficient when included in the medication reconciliation process; they decrease costs and provide support to other HCPs [4]. Thus, the requirement for health systems to conduct medication reconciliation offers both educational and service opportunities for Pharm D students. According to the WHO, millions of people are harmed each year due to unsafe healthcare, resulting in 2.6 million deaths annually in low- and middle-income countries alone.[5] Medication reconciliation has also been recommended by the institute of healthcare improvement as a validated method to reduce adverse drug effects due to medication discrepancies. [6] A recent survey of general hospital pharmacy practices revealed that only 41% of hospitals perform medication reconciliation upon admission, transfer of care, and discharge. Teaching hospitals were more likely to conduct medication reconciliation and had more advanced pharmacy services, often cooperating with affiliated medical schools.[7]A previous study, showed that student pharmacists and faculty identified more than 1000 medication-related problems, 4.3% of which were related to medication reconciliation.[8]A study assessing hospital pharmacy medication reconciliation practice showed relatively low awareness of the concept and policy of medication reconciliation process among pharmacists.[9] The present study was conducted to estimate the unintentional discrepancies by reconciling all medications administered to the patient during the admission.

MATERIALS AND METHODS

STUDY DESIGN:

The present work was a prospective, observational study that was conducted to identify medication reconciliation in inpatient (Admitted) of various department of the Hospital.

SAMPLE SIZE:

A total of 255 discrepancies were identified in the current study

ETHICAL CLEARANCE:

Ethical Clearance was obtained from the Institutional Ethics Committee (IEC) of Srinivas Institute of Medical Science and Research Centre (SIMS & RC), Mangalore.

Inclusion criteria:

Patient admitted in the hospital aged >18 years, of any sex and who is already having any comorbid condition and was using any drug prior to the admission.

Exclusion Criteria:

Patients of vulnerable population, unconscious, who are not willing to participate, those who are not able to provide history within 24 hours are excluded from the study.

SOURCE OF DATA:

The data for the study was obtained from Physician, Patient and Medical Records. The BPMH for each patient includes all information

regarding pre-admission medication along with the dose and frequency for each drug, vitamins, herbal medication or non-prescription drugs or any drug or food allergies.

MATERIALS USED:

Data were collected using a structured data collection form that include the patient's demographic details, past medical and medication history, current medications given, any discrepancies found in prescription, errors encountered and its severity. NCC MERP classification and guidelines was used for the assessment of severity of error

DATA ANALYSIS:

Statistical analysis involves collecting and scrutinizing every data sample in a set of items from which samples can be drawn and a suitable statistical test was applied to analyze the data. The collected data were analyzed using Microsoft Excel

RESULT

Demographic Characteristics

Out of the 600 patients included in the study, 42.5% (255 patients) had discrepancies in their prescriptions. The average age of the patients was 58.6 years, with 51.76% being male. Notably, 55.29% of the patients were aged above 60, emphasizing the vulnerability of geriatric individuals for developing chronic diseases. Detailed demographic information of the subjects can be found in Table 1.

Table 1: Demographics of Subjects

Age (yrs.)	Male (n=132)	Female (n= 123)	Total (n=255)
18-39	21 (15.90 %)	15 (12.19 %)	36 (14.11 %)
40-59	36 (27.27 %)	42 (34.14 %)	78 (30.58 %)
60 &above	75 (56.81 %)	66 (53.65 %)	141 (55.29 %)

Number of Co-Morbidities

The study explores the relationship between comorbid conditions and medication discrepancies. Evidence suggests that as the number of comorbid conditions increases, the number of prescribed medications also rises, potentially leading to intentional or unintentional medication discrepancies on charts. In this study, 784 comorbidities were identified. The majority of patients (47.84%) had two comorbid conditions, followed by those with three comorbidities (22.74%). A detailed breakdown of the quantity of comorbidities can be found in Table 2.

Table 2: Number of Co-Morbidities

Number of co-morbidities	No. of co-morbidities per subject(n=255)
1	57 (22.35 %)
2	122 (47.84 %)
3	58 (22.74 %)
≥4	18 (7.05 %)

Number of Past Medications per Prescription

Effective medication reconciliation relies on obtaining a patient's past medication history. The presence of polypharmacy is a key factor in the occurrence of medication discrepancies. Among the 255 patients in the study, a total of 1007 drugs

were administered. Table 3 illustrates the distribution of participants based on their past medication history. The majority, 162 patients (63.52%), were prescribed 1-5 medications, followed by 6-8 medications for 35.29% of patients, and 1.56% of patients received 9 or more medications. These findings will be valuable for assessing the association of past medication history (Table 3) with medication discrepancies.

Table 3: No. of Past Medications per Prescription

No. of medications	No. of medication per prescription (n=255)
1-5	162 (63.52 %)
6-8	90 (35.29 %)
≥9	4 (1.56 %)

Category of Discrepancies

In this study, medication discrepancies were classified as intentional and unintentional. Intentional discrepancies involved medication changes based on evolving clinical status, while unintentional discrepancies included issues like omission or duplication. Out of the 633 discrepancies identified during admission, 53.23% (337 discrepancies) were intentional, and 46.76% (296 discrepancies) were unintentional. Table 4 provides a breakdown of these categories

Table 4: Category of Discrepancies during Admission

Discrepancies	No. of discrepancies during admission (n=633)
Intentional	337 (53.23 %)
Unintentional	296 (46.76 %)

Type of Un Intentional Discrepancies Observed

A total of 296 unintentional discrepancies were identified, with drug omission being the most prevalent type of error, accounting for 45.15%. For instance, there were cases where the patient's chart indicated a daily dose of 20 mg of medication X, but it was not administered for two consecutive days due to an oversight. This was followed by altered route errors, which accounted for 19.57%. An example of this is when a physician prescribed medication Y for oral administration, but it was mistakenly administered intravenously. Details of the errors observed in this study can be found in Table 5.

Table 5: Type of Un Intentional discrepancies During Admission

Type of discrepancies	No. of unintentional discrepancies during admission (n=296)
Drug omission	111 (45.15 %)
Altered medication	43 (13.37 %)
Drug Duplication	06 (1.16 %)
Altered frequency	21 (3.68 %)
Altered dose	53 (17.05 %)
Altered route	62 (19.57 %)

Classification of Severity of Medication Errors According to NCC-MERP Guidelines

Assessing the severity of medication errors is vital for patient safety. The National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) was used to categorize error severity. The findings showed that the majority of errors, accounting for 52.54%, were under Category C, indicating errors that reached the patient but did not cause harm. Additionally, Category D, representing errors that reached the patient but required monitoring to confirm no harm, made up 36.07% of observed errors.

Table 6: Severity of Medication Errors

Severity of error	No of prescription (n=255)
Category A	0
Category B	15 (5.88 %)
Category C	134 (52.54 %)
Category D	92 (36.07 %)
Category E	12 (4.71 %)
Category F	02 (0.78 %)
Category G	0
Category H	0
Category I	0

DISCUSSION

This study involving 600 patients found a slightly higher percentage of men and a majority aged over 60, emphasizing the need to address healthcare for older individuals. In contrast, Meda V.S. et al.'s study of 106 participants reported 42% men and 58% women, with 63% over 60. The current study, with its larger sample size and focus on prescription accuracy, provides a more comprehensive understanding of patient demographics and healthcare quality. These findings highlight the necessity of reconciling healthcare for older patients and ensuring precise medication administration to enhance patient care and safety.1] The present study analyzed a total of 784 comorbidities, most patients had two comorbidities followed closely by those with three. This suggests that many patients have multiple health issues simultaneously, thereby complicating their medical care. Mattia Del toset al.'s study echoes this pattern, finding that a high percentage of patients (77.8%) had two or more comorbidities when admitted to the hospital. Together, these findings emphasize the importance of considering these multiple health conditions when providing care, as they can impact treatment decisions and patient outcomes. [10] It was found that most prescriptions, contained between 1 to 5 past medications. A smaller number, had 6 to 8 past medications, and very few, had 9 or more past medications. This shows the number of medications patients were taking when they were admitted, and it's crucial for understanding medication discrepancies. Mattia Del toset al.'s examined medications in a patient group and found a total of 1565 medicines. Out of these, 856 were medications that patients were already taking at home, and 709 were new medications prescribed during their hospital stay. [10] During admission, out of the 633 discrepancies identified, majority were considered intentional, meaning they were planned medication changes, while others were unintentional, indicating they weren't part of the original plan. In Mattia Del toset al.'s study, 367 discrepancies were identified at hospital admission, out of which 314 were intentional and

53 unintentional discrepancies were found. [10] This study revealed that drug omission was the most common type of error during admission. In a study conducted by Mattia Del toset al, they found that medication omission was the most frequent type of error, making up 92.5%of discrepancies. [10] Medication discrepancies were classified based on their severity using a standard system called the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) classification. Current study revealed that the majority of errors fell into Category C which means error reached the patient but didn't cause any harm. The next most common category was Category D where errors reached the patient but required monitoring to ensure no harm occurred. In contrast, Meda VS et al.'s study found that a majority of errors belonged to Category E (53%). This category suggests that these errors may result in temporary harm to the patient.[1]

CONCLUSION:

This study highlights the critical role of medication reconciliation in improving patient safety and reducing medication errors in hospitals. Among 600 patients, 42.5% experienced unintentional medication discrepancies, especially among the elderly and those with multiple health issues. Involving pharmacists and pharmacy students significantly reduced errors, improved safety, and lowered costs. Most errors were Category C (reached the patient but caused no harm), with some in Categories D and E (requiring monitoring or causing temporary harm). The study advocates for robust reconciliation protocols in healthcare facilities, emphasizing the expertise of pharmacists to ensure optimal patient outcomes.

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