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From Inaccuracy to Insight: Identifying Medication Discrepancies through Observational Reconciliation at a Tertiary Care Hospital, Bhimavaram of Andhra Pradesh

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Abstract

Background: Medication reconciliation is the process of examining the patient's entire medication regimen at the time of admission, transfer, and discharge and comparing it with the regimen being considered for the new setting of care. This helps to prevent unintentional inconsistencies across transitions in medical care. Medication reconciliation protects patients from medication side effects while ensuring that they receive standard care. It serves as the baseline from which therapeutic interventions are developed, drug treatment is continued upon admission, and self-care is continued upon release.
Objectives: Determining the frequency and kinds of discrepancies discovered during medication reconciliation was the main goal of this study. Determining the effect of medication reconciliation to assess the possible seriousness of medication inconsistencies and ascertain the drug's role in medication errors was the secondary goal.
Methodology: In the inpatient units of a tertiary care hospital in the West Godavari District, a prospective, observational study on medication reconciliation was conducted for six months. Results: Of the 385 patients that made up this study, 224 (58.18%) were males and 161 (41.8%) were females. In 169 (43.89%) of the patients, medication discrepancies were detected. There were inconsistencies discovered at several transition points: 50 disparities were detected at admission, 50 during the transfer phase, and 17 on the discharge. **Conclusion**: A multi-centric assessment including parameters like the percentage of inpatients encountering at least one major medication error would be intriguing. This may support the idea that drug reconciliation is crucial for patient safety.

INTRODUCTION:

The procedure or technique used by medical practitioners to obtain a precise and comprehensive list of a patient's prescription and over-the-counter medications is known as medication reconciliation. According to the Agency for Healthcare Research and Quality (AHRQ), medical professionals utilize it to compile an accurate and thorough medication list for every patient, including prescription and over-the-counter drugs [1]. The data supporting medical reconciliation interventions was compiled in two recent systematic reviews, which concluded that several medication reconciliation programs decreased medication history errors and errors in patients' admission and discharge medication regimens. Although proven effective in lowering errors, there are limitations [2].

To prevent inadvertent differences in patients' prescriptions during care transfers, medication reconciliation is strongly advised. Only a small number of patients experience clinically significant unintended differences. When combined with other interventions that enhance discharge coordination, medication reconciliation may reduce post-release hospital utilization within 30 days, but it probably won't do so on its own. A significant portion of the most effective initiatives involve pharmacists. The effect of medication reconciliation is not consistently improved by commonly used criteria for choosing high-risk individuals [3]. Due to changed pharmacokinetics and pharmacodynamics, multi-morbidity, increased frailty, and Polypharmacy—generally defined as taking five or more drugs daily with a higher risk of drug interactions—older individuals are more vulnerable to ADEs.

Furthermore, because hospitalization frequently results in a discontinuity in the medical pathway treatment for older individuals due to several medication changes, it increases this risk [4, 5, and 6].
In clinical practice, medication reconciliation is seen as a crucial step to guarantee patient safety and prevent medication inconsistencies or conflicts at the time of admission [7], during transitions from one unit to another, or upon discharge [8]. Due to frequent re-admissions and changes in medicine generics, elderly individuals with serious conditions are particularly vulnerable to medication inconsistencies [9]. Moreover, a rise in medication inconsistencies has been linked to regimen complexity [10, 11]. The most frequent inconsistencies at the time of discharge were medication omission and insufficient, erroneous, and difficult-to-read discharge instructions [12, 13].

Any inadvertent variations between the medication taken before admission and the medication administered in the hospital were referred to as medication discrepancies [14]. Approximately 50% of these errors primarily happen during the admission and discharge processes, with 30% of those inaccuracies potentially harming the patients [15, 16]. Medication prescribed for the patient at release is frequently different from medication prescribed before admission due to the patient's condition. This might result in inadvertent differences such as missing a prescription or inadvertent disparities like dose and frequency errors. To address this issue, the WHO and the Joint Commission-National Patient Safety Goal have recommended a medication reconciliation procedure that, if contained in medication lists [17], identifies any inadvertent differences and aids in keeping an accurate list of patient medications [18].

Medication prescription and administration errors are common, expensive, and dangerous [19]. Inadequate medication reconciliation during care transitions accounts for over 40% of medication mistakes [20]. As patients travel between various stages and settings of care, transitional care ensures that their care remains uninterrupted [21]. Many different settings (hospitals, community centers, and long-term care facilities) and stages of care (admission, transfer, and discharge) have reported on the prevalence of medication discrepancies arising at care transitions; in particular, moving from an inpatient to an outpatient setting is linked to an increase in medication errors compared to other stages of care [22, 23, 24]. Up to 19% of adverse events after hospitalization have been documented; most of these are associated with adverse drug events (ADEs), which can be the consequence of prescription error. One of the 2007 National Patient Safety Goals set forth by The Joint Commission is the reconciliation of pharmaceuticals throughout the continuum of care [25].

For patients admitted during regular business hours, the primary care medical team should be prepared to furnish a precise prescription list. Acute and recurring drugs should be updated regularly, and any modifications should be recorded on the General Physician practice's prescribing system. Upon admission, the healthcare professional will do the medication reconciliation job. Every patient needs to have their medications reconciled, regardless of how they were in. When a patient is moved from one hospital or care environment to another, such as from a critical care unit to a regular ward, medication reconciliation should be done once more. By doing this, it will be guaranteed that medications are discontinued, withheld, started, or continued according to the patient's evolving condition. Transferring comparable medication information throughout the care settings will be ensured by an accurate and comprehensive medication reconciliation at the time of release. A complete list of all the medications the patient is to take at home, along with information on dosage, formulation, route, frequency/timings, and duration, must be included in the discharge prescription. Medical staff and/or nurse practitioners or pharmacists, if applicable, must record any modifications to medications and the rationale for them on the discharge prescription [26].

Medication Reconciliation, however, is thought to be the gold standard for minimizing drug inconsistencies. Our study mainly focuses on determining the kind and frequency of prescription discrepancies discovered through medication reconciliation, as well as the kinds of medications where errors are more likely to occur.

METHODOLOGY:

Medication reconciliation at the hospital's inpatient (admitted) department was the subject of a prospective, observational study. In Bhimavaram, Andhra Pradesh, India, a multispecialty hospital housed the study for six months. The Hospital Advisory Board approved the project and permitted data gathering. We examined every prescription that was electronically sent to the discharge pharmacy for patients who were scheduled for discharge. The patient's home medication list, which was obtained from the emergency room's medication reconciliation form upon admission, the medication administration record, and the medication history in the clinical management software used by the hospital management were then cross-referenced with the medications.

The consideration criteria that were viewed in the study were the patients who had been admitted to the hospital, the patients older than 18 years, the patients of any gender enrolled for the study, and the patients who previously had any comorbid conditions and were utilizing any medication before admission. At least 24 hours of stay in the clinical setting after confirmation was considered to finish the most ideal prescription history activity. Patients of weak populations, who are oblivious, who are not ready to partake, whose case archives were missing, who moved to one more healthcare center during continuous treatment, or the individuals who couldn't give history within 24 hours were barred from the study.

A structured data assortment form was used to collect the information. The study's primary findings revealed differences linked to medications, dosage, course, recurrence, or administration route; auxiliary findings, on the other hand, revealed restraint-related, or the decrease in prescription discrepancies. Errors and compromises were included in an information assortment organized form that included the patient's details, prescription history, and medication prescriptions at different stages of their transition at the hospitals.

Before collecting data from research participants, the patient signed the consent form. The patient's prescription history from the patient or guardian interview, patient case document, medicine boxes, nursing notes, and discharge notes, as well as information from the patient's clinical records and clinical information database, were used to compile information about each member. Age, gender, the number of medications taken, and the category of medications were the details gathered. To ascertain whether a discrepancy existed, they also ascertained the discrepancies' status. Any disparity between the medications stated in the patient's medical history and the prescriptions listed on the discharge prescription was referred to as a discharge medication discrepancy.

Intentional or inadvertent discrepancies were categorized first, followed by omission, commission, altered dosage, frequency, or method, erroneous duration or quantity, and therapeutic duplication. We also looked into the amount of discrepancies per patient, the type, category, and severity of the discrepancies. The prescriber was consulted when in doubt. In addition, analyses were conducted on the number of inconsistencies per patient, the type, category, and severity of the discrepancies. Three categories were used to categorize the

degree of medication inconsistencies; **Minor:** in which the patient's result would not be impacted by missing medication. **Moderate:** The patient's result would be negatively impacted if this discrepancy persisted or was discovered by the patient. **Major:** The patient's outcome would be harmed if this disparity persisted or was experienced by the patient [27].

The sample size is calculated from the below formula; $n = \frac{z^2 \times p(1-p)}{e^2}$

Where n is the sample size, z is the confidence level (1.96), p is the population proportion (50% or 0.5), and e is the margin of error (0.05). The sample size obtained by computing the above formula is 385.

Ultimately, an examination of the patient's clinical records was conducted to ascertain the intentionality or inadvertence of the disparities discovered. An unintentional discrepancy is one that the doctor or pharmacist made by mistake and/or neglected to record in the clinical records, whereas an intentional discrepancy is one that the prescriber made on purpose to satisfy the patient's needs and documented properly.

Records were kept on the average number of differences per patient and the proportion of patients who had at least one inadvertent discrepancy. In addition, the severity, frequency, and proportion of each discrepancy category were looked at concerning the drug inconsistencies that were found. To characterize any category variable, frequency and percentage are used. The statistical software SPSS 29.0 was utilized to examine every piece of information. We looked at the number of comorbidities, age, gender, and number of pre-admission and discharge drugs as potential risk factors. A p-value of less than 0.05 was deemed statistically noteworthy.

RESULTS & DISCUSSION:

During the six-month study period, 385 patients who met the inclusion criteria were admitted and discharged. There were 224 (58.18%) male patients out of 385 total, and 161 (41.81%) female patients. The majority of study participants, 168 patients (43.63%), are in the 51–65 age range, followed by 97 patients (25.19%) in the 66–80 age range, and 75 patients (19.48%) in the 36–50 age range. The remaining 45 patients, or 11.68%, are in the 20–35 age range. Out of 385 patients, we discovered 432 discrepancies in about 169 of them.

106 (62.72%) of the 169 cases in which we discovered the discrepancies included males, and 63 (37.27%) involved females. The age group of 51–65 years accounted for the majority (179, 41.43%) of drug discrepancies in their prescriptions, with 118 prescriptions (27.31%) falling into the 66–80-year patient age group. The remaining prescription inconsistencies were discovered in 89 (20.60%) patient's prescriptions in the 36–50 age group and 46 (10.64%) prescriptions of the patients in the 20–35 age group.
Out of the 169 cases having medication discrepancies, 123 (72.78%) patients were prescribed more than 5 medications, and 46 (27.21%) prescriptions were with less than 5 medicines. Out of 432 discrepancies, none are documented discrepancies, and 432 (100%) are undocumented discrepancies. Out of these undocumented discrepancies, 117 (27.08%) were unintentional discrepancies, and 315 (72.9%) were intentional discrepancies (documentation errors).

Out of the 117 Unintentional discrepancies, the Omission of drugs stands first with a frequency of 37 (31.62%) followed by wrong frequency of the drugs with a frequency of 21 (17.94%), Duplication of the drugs with 18 (15.38%), pre-admission drugs not continued with a frequency of 12 (10.25%), wrong drug prescribing with a frequency of 11 (9.40%), the drugs with wrong dose with a frequency 10 (8.54%), and finally moderate and severe drug interactions with a frequency of 8 (6.83%).
The seriousness of these errors was categorized into three classes, Class I (mildly serious discrepancies, 42 in number; 35.89%), Class II (moderately serious discrepancies, 37 in number; 31.62%), and Class III (severely serious discrepancies, 38 in number; 32.47%)

Out of the 117 unintentional discrepancies, the most common category of medicines involved are the drugs used to manage glycemic control (Endocrine medications) with a frequency of 31 (26.49%), followed by Cardiovascular medications; 28 (23.93%), Neurology-related medicines; 15, (12.82%), Nephrology system related medicines; 13 (11.11%), Gastrointestinal related medicines; 9 (7.69%), Respiratory related medicines; 7 (5.98%), Orthopedic medicines; 6 (5.1%), and other miscellaneous agents 8 (6.83%)
Patients having one discrepancy in their prescriptions are 235 (54.39%), 2 discrepancies in their prescriptions are 118 (27.31%), and 3 discrepancies in their prescriptions are 79 (18.28%).

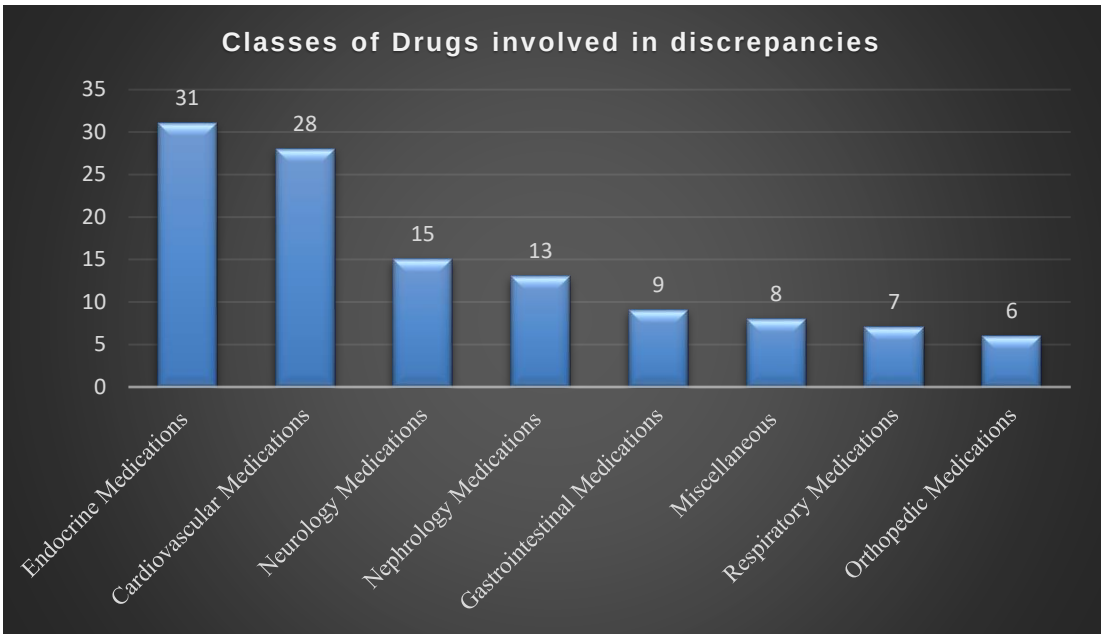

Fig.1 Distribution of drugs involved in discrepancies at the Hospital

This study looked at the types and prevalence of medication discrepancies at the time of admission, transfer, and discharge from the hospital. To the best of our knowledge, no prior research has been done in our area assessing the prevalence of medication discrepancies in the hospital setting. The study's findings revealed an alarmingly high rate of discrepancies, with just under half of the patients having at least one unintentional prescription discrepancy. They also highlighted the seriousness of the discrepancies, with 63% of them being linked to a potential moderate to severe harm to the patient.

Corrective measures were put into place after any inadvertent disparities were discovered and reviewed and explained with the relevant staff, which included doctors, nurses, and pharmacists. All missed doses of medication were resumed. All incorrect commissions, duplications, frequency, and durations were fixed. There was no correlation found between the number of comorbidities, age, gender, or pre-admission drug counts and the prevalence of inadvertent disparities.

The study emphasized the need of incorporating a reconciliation service at the time of discharge, whereby any inadvertent inconsistencies were reviewed and clarified with the relevant staff members, such as doctors, nurses, or pharmacists, and a correction action was then put into place. Before being released, any inadvertent discrepancies were fixed. Therefore, Clinical pharmacist-supported medication reconciliation can be highly helpful in addressing inadvertent prescription differences, which may improve the safety and efficacy of drugs [28]. Intended differences that are not properly documented pose a risk because confusion and medication errors may result from the prescriber's deliberate decision to make adjustments without properly documenting it.

A small number of patients, a single-center setting, and a small group of students performing medication reconciliation with the assistance of a healthcare provider team are some of the study's shortcomings. Medication inconsistencies are classified using subjective criteria that may be biased. Recall bias might be lessened, though, if patient and caregiver interviews are used.

CONCLUSION:

The drug reconciliation process is a useful tool for reducing inadvertent medication errors and discrepancies in hospitalized patients. In comparison to hospitals that did not have medication reconciliation at admission or during the transition of care and discharge, the best practice is to adopt the medication reconciliation procedure during admission, which may result in a decrease in the incidence of medication discrepancy.

To standardize drug reconciliation procedures, the report recommends more investigation and cooperation with medical professionals. Technology implementation, such as computer-based reconciliation, can reduce inconsistencies and raise the likelihood of prevention. Medication safety has to be given more attention in clinical pharmacy departments and hospitals. To improve the standard of patient medication discharge communication, we advise putting the "best possible medication reconciliation" practice model into practice in addition to other approaches.

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COMPETING INTERESTS:

The authors declare that they have no competing interests.

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