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The Impact of a Structured Pharmacist-Led Medication Reconciliation Process on Medication Discrepancies at Hospital Admission: A Pre- and Post-Intervention Analysis

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Abstract

Medication discrepancies at hospital admission are a common source of possible patient harm. Nurses mainly collect the first medication history but they face difficulties such as time constraints and incomplete patient knowledge while clinical pharmacists have the ability to carry out accurate reconciliations but are not always integrated into the admission process.

The main objective of the study was to measure the impact of a structured, pharmacist-led medication reconciliation process, which is executed in collaboration with nursing staff, on the unintentional medication discrepancies occurring at the time of hospital admission.

A quasi-experimental study was conducted for a specific period of time in a 40-bed medical-surgical unit. In the pre-intervention phase (n=100), MedRec was performed by nurses who followed the standard admission protocol. In the post-intervention phase (n=100), the nurses prepared the list of medications and included it in the clinical admission protocol which was first checked and last confirmed by the clinical pharmacist who came on duty at the hospital within the allotted time of 4 hours since admission. The primary outcome was the rate of unintentional discrepancies put down per patient.

The pre-intervention group had 148 unintentional discrepancies in total (per patient mean value 1.48 ± 1.1), while the post-intervention group had 42 discrepancies (per patient mean value 0.42 ± 0.6). This indicates a 71.6% decrease in the error rate in this regard. It is a noteworthy finding that the rate of discrepancies went down significantly ($p < 0.001$). The major types of discrepancies were omission (52.7%) and incorrect dosage (22.3%). Pharmacist involvement was most often wanted for cardiovascular and endocrine medications.

The admission MedRec protocol with a clinical pharmacist significantly reduces the rate of unintentional medication discrepancies when the pharmacist is integrated into the process and collaborates with the nursing team. Doctors' communication with patients is enhanced by the nurses' skills, while prescription accuracy is guaranteed through the pharmacists' knowledge of medications. Therefore, that is how the two professionals work together in making this process of medication safer.

Keywords: Medication Reconciliation, Clinical Pharmacy, Nursing, Patient Safety, Inter–professional Collaboration, Medication Errors.

Introduction

Patient safety is one of the most important subjects in today's medical care philosophy, and errors in medication consumption are considerably threatening. One of the critical points is the care transition that occurs during hospital admission. The Medication Reconciliation (MedRec) process is a formal procedure aimed at compiling the most accurate

list of medication that a patient is taking and other healthcare providers use to correctly prescribe medications for the patient all over the healthcare system [1]. Incorrect medication lists on admission may lead to unintentional discrepancies—differences in the medication history and the admission orders that are unintentional—which may bring about adverse drug events, therapeutic failures, and longer-lasting hospitalization [2].

Receiving medication histories is the principal duty that nurses undertake for the most part. Since nurses spend time providing care for patients and they are good at assessing patients, they mostly do the job. Nevertheless, nurses' workloads are affected by a shortage of time because they have to handle multiple patients and various competing priorities, limiting their time for a good quality medication history. Most notably, patients frequently forget their actual medicine names, dosages, or frequencies, resulting in an incomplete or incorrect initial list [3].

Clinical pharmacists, because of their knowledge in pharmacotherapy, are especially suitable to enhance the quality of MedRec. It has been shown that the pharmacist-led MedRec can significantly decrease discrepancies [4]. Nevertheless, the model that works the best is not to substitute the nurse but to promote co-operation. This research project measures the effect of the structured, pharmacist-led MedRec process, designed to function with the nursing team, by dealing with unintentional medication discrepancies at the time of hospital admission.

Materials and Methods

2. Methods

2.1 Study Design and Setting

This research was a pre- and post-intervention study for a period of 6 months (January-June 2023) in a 40-bed medical-surgical unit in a 300-bed tertiary care hospital. The study was approved by the hospital's Institutional Review Board with a waiver for informed consent due to the quality improvement nature of the intervention.

2.2 Participants

A total of 200 adult patients (who are 18 years of age or older) who are admitted from home were included in this study: 100 patients in the pre-intervention group (March-April 2023) and 100 patients in the post-intervention group (May-June 2023). Patients who were admitted from long-term care facilities, those with no pre-admission medications, and those who were critically unstable at admission were excluded.

2.3 Intervention

Pre-Intervention Phase (Standard Practice): Upon admitting the patient, the nurse at the bedside was the one to take the patient's "home medication list" through an interview and to check any available documentation. The nurse then placed the list into the electronic health record (EHR), which the physician referred to when writing admission orders. Later, the clinical pharmacist would check the orders, typically doing it in 24 hours.

Post-Intervention Phase (Structured, Pharmacist-Led Process):

1.Nurse's Role: The nurse did the admission assessment and he/she took the admission medication list while notifying the clinical pharmacist of the new admission.

2.Pharmacist's Role: A dedicated clinical pharmacist was assigned to the unit. Within 4 hours of admission, the pharmacist conducted a comprehensive MedRec. This involved reviewing the nurse's initial list, conducting a detailed patient/family interview, and contacting the community pharmacy and/or primary care physician for verification. The pharmacist then documented a "Best Possible Medication History" (BPMH) in the EHR.

3.Collaboration: The pharmacist communicated any identified discrepancies directly to the prescribing physician for order modification and informed the primary nurse of the changes.

2.4 Data Collection and Outcomes

Data were collected retrospectively from the EHR. The primary outcome measure was the number of unintentional medication discrepancies per patient, identified by comparing the initial admission orders with the verified BPMH. A discrepancy was classified as "unintentional" if there was no documented clinical rationale for the change. Data on the type of discrepancy (omission, wrong dose, wrong frequency, wrong drug) and medication class involved were also collected.

2.5 Statistical Analysis

Questions for the statistical analysis were investigated using SPSS version 26. The data were described by means of descriptive statistics (means, standard deviations, and frequencies). A chi-square test was utilized to compare the proportion of patients with one or more discrepancies between the two groups. An independent samples t-test was performed in order to compare the mean number of discrepancies per patient. Results with a p-value less than the threshold of 0.05 were considered significant.

Results and Discussions

The audit focused on a total of 200 patient admissions. The demographic characteristics of the pre-and post-intervention groups were similar, with no significant differences in age, gender, or the number of pre-admission medications (Table 1).

Table 1: Baseline Patient Demographics

Characteristic	Pre-Intervention (n=100)	Post-Intervention (n=100)	p-value
Mean Age (years ± SD)	68.5 ± 12.3	67.1 ± 13.8	0.45
Female, n (%)	55 (55%)	52 (52%)	0.66
Mean Pre-admission Medications (± SD)	8.2 ± 3.5	7.9 ± 3.8	0.55

The analysis revealed a statistically significant reduction in all metrics related to medication discrepancies following the implementation of the pharmacist-led process (Table 2).

Table 2: Primary Outcomes: Medication Discrepancy Rates

Metric	Pre-Intervention Group (n=100)	Post-Intervention Group (n=100)	P-value
Total Discrepancies	148	42	**<0.001**
Discrepancies per Patient (Mean ± SD)	1.48 ± 1.1	0.42 ± 0.6	**<0.001**
Patients with ≥1 Discrepancy, n (%)	78 (78%)	31 (31%)	**<0.001**

An analysis of the types of discrepancies and the medication classes most involved is presented in Table 3. Omissions were the most common error, and cardiovascular agents were the most frequently discrepant medication class.

Table 3: Analysis of Discrepancy Types and Medication Classes

Category	Pre-Intervention (n=148) n (%)	Post-Intervention (n=42) n (%)
Type of Discrepancy		
Omission	78 (52.7%)	18 (42.9%)
Incorrect Dose	33 (22.3%)	12 (28.6%)
Incorrect Frequency	25 (16.9%)	8 (19.0%)
Incorrect Drug	12 (8.1%)	4 (9.5%)
Top Medication Classes		
Cardiovascular	45 (30.4%)	14 (33.3%)
Endocrine	32 (21.6%)	9 (21.4%)
Central Nervous System	28 (18.9%)	8 (19.0%)
Gastrointestinal	20 (13.5%)	5 (11.9%)

4. Discussion

This investigation's findings point out an evident and substantial advantage of implementing a structured, pharmacist-initiated, and medication reconciliation process with the close cooperation of nursing. The 71.6% decline in inadvertent contradictions in medication is a reminder of the characteristically major impact that clinical pharmacists have on patient safety right at the admission process.

This particular model was able to capitalize on the unique competitive advantages of the both professions. Nurses were the crucial first point of contact for the patient as well as for the assessment, thus ensuring that there were no delays in the admission process. Then the pharmacist provided the distinct skill necessary to check, clarify, and finish the medication list, which is a task for which they are specifically trained alone. This collaborative effort not only releases nurses from their duties but also benefits them by giving them time to handle other critical issues of the patient [5].

The outcomes go hand In hand with what other studies reveal. In a systematic review, Mekonnen et al. conclude that pharmacist-led MedRec was very effective in lowering the rates of medication discrepancies and adverse drug events [6]. Our research contributes to the evidence base by outlining an effective model to be included in a medical-surgical unit's everyday activities.

The major discrepancies in this case were those cases that were missed, mainly cardiovascular medications and endocrine medications. These medications are generally "high-alert" medications that if administered inappropriately, result in

serious harm like unrestricted hypertension or hypoglycemia. The fact that the pharmacist could talk to community pharmacies was a very important element for the right identification of these drugs which were not listed.

4.1 Limitations

The study was carried out in a single unit at one hospital making generalizability an issue. Besides, the pre-post design is prone to historical biases, even if no other systematic adjustments to the admission process were made during the study period. The expense of having a clinical pharmacist allocated solely to this unit will also be an issue to consider, but the liability of that expense may be outweighed by the decrease in potential adverse events along with the reversal costs.

Conclusion

The embedding of a clinical pharmacist in entire admission workflow along with the nurse's guidance over the medication reconciliation process, in a structured pair-work model, is one of the most effective means of security medication. The model lowers inevitable medication discrepancies thus displacing the risk of medication errors and adverse drug events during the hospital stay.[NP1]

Implications for Practice:

•For Nurse Leaders: Promoting clinical pharmacy support in admission processes is a good way to improve patient outcomes and increase nursing satisfaction.

•For Hospital Administrators: Funding clinical pharmacy services for MedRec is a long-term positive economic growth strategy and it agrees with the patient safety goals

•Future studies should concentrate on the long-term effects on the clinical results like adverse drug event rates and the number of hospital readmissions.

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