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The Role of Nurses and Pharmacists in Reducing Medication Errors: A Collaborative Approach in Clinical Settings.

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Introduction

An elderly patient suffering from severe cystitis and sepsis. The discharge orders did not include Centrum Silver, which is a component of the HML.

The patient had a UTI when they were admitted. Although it wasn't listed on the discharge instructions, the patient's HML contained 100 mg of metoprolol XL.

The patient was admitted with hypertension. The patient's HML, which called for taking 0.2 mg of clonidine orally three times a day, was left out.socioeconomic factors include low income and poor English proficiency, poly-pharmacy, non-compliance/medication adherence, changing care facilities, and incorrect use of high-risk drugs (Lyson et al., 2019; Taylor et al., 2018). The number of caregivers, their skill levels, mistakes or inconsistencies in the medication use process, drug-drug interactions, potentially inappropriate prescriptions, and insufficient monitoring of clinical indicators that lead to duplicate medications, non-therapeutic dosing, and adverse drug events are all factors that are related to the provider (Banning, 2005; Lyson et al., 2019). Risk factors within the healthcare system are influenced by a number of factors, including funding variations, provider skill mixes the availability resources, and the absence of universal norms and required reporting systems (Lyson et al., 2019). Patient safety may be impacted by medication safety atany phase: pharmaceutical administration, dispensing, monitoring, prescription, transcribing, and assessment (Godfrey et al., 2013). Elements that jeopardize drug safety can be addressed by addressing adverse events, examining the best available medication histories, keeping an eye on clinical indicators, ensuring appropriate (Alper et al., 2020; Foubert et al., 2019).

Medical Careviews cooperation as a dynamic, multifaceted process that takes into account the viewpoints of patients and providers (D'Amour et al., 2005). Interprofessional collaboration is facilitated by positive team dynamics, common objectives, open communication, knowledge exchange, and reciprocal involvement to integrate professional responsibilities (Celio et al., 2018; Engel and Prentice, 2013). Patients participate in care and decision-making through such group action (Jones et al., 2017).

A study at a tertiary care hospital involved a team of registered nurses and a pharmacist. The primary intervention involved compiling home medication lists to identify potential unintended admission and discharge discrepancies. Adjudicators assessed the potential harm of these discrepancies, rating them from 1 to 3. The study estimated the cost of inpatient medication errors (ADEs) from 1996 to 2008, with an average cost of $9344.12. The study compared the program's cost with potential cost savings, performing a threshold analysis to determine the minimum proportion of ADEs requiring harm.

Aims and Objectives

The study aims to evaluate the effectiveness of nurse-pharmacist collaborations in reducing medication errors in clinical settings, identify interventions, and explore challenges and facilitators.

Literature Review

Collaboration between community nursing and pharmacies

The objectives of community-based care center on improving life, promoting care, preventing sickness, maintaining for clients with chronic diseases who live in their homes or natural settings (Hunt, 2012). Nurses provide care in a variety of venues, such as client homes, assisted living facilities, nursing homes, and community health centers. Compared to hospitalized patients, community clients are more involved in managing their chronic disease medications (Foubert et al., 2019). They keep an eye out for adverse consequences that could impair their psychological well-being, capacity to carry out everyday tasks, and cognitive, visual, emotional, and behavioral patternsand could have an effect on their general home safety (Foubert et al., 2019).

By addressing drug safety, a community pharmacist's involvement could strengthen these care teams (Tasai et al., 2019). To ensure drug safety, the pharmacist can offer medication reconciliation, spot and fix pharmaceutical errors, and give clients medication advice (Banning, 2005; Tasai et al., 2019). By streamlining medication regimens, guaranteeing precise and unambiguous medication treatment orders, assisting in the monitoring of high-risk medications, responding to inquiries about medications, and raising concerns about non-adherence in community settings, community nurses and pharmacists can lower adverse events and the hospitalization of adults who live in the community (Lee et al., 2018a; While, 2019).

Additionally, these partnerships can lessen the workload and wait times for doctor visits, enhancing the ability of community-dwelling adults to manage chronic illnesses on their own (Celio et al., 2018; Hadi et al., 2012).

Enhancing Medication Safety in Community Settings:

Partnerships between nurses and pharmacists can assist community-dwelling persons better manage chronic illnesses by cutting down on workload and medical visit wait times. However, there is little study on nurse-pharmacist collaborations in community settings; instead, the majority of the literature focuses on chronic conditions including dementia, diabetes, and heart failure. Given the rise in chronic diseases, the difficulty of managing disorders, and concerns regarding pharmaceutical safety, it is imperative to comprehend how these collaborations could improve medication safety.(Hadi et al., 2012)

Interprofessional conflicts, marginalization, and a lack of integration among team members can result from dyads, or interprofessional teams. Due to ambiguous roles, responsibilities, and pay structures, physicians in community settings are frequently hesitant to employ or refer advice from nurse-pharmacist dyads. Monitoring changes to patients' prescription regimens is a common aspect of nurse-pharmacist collaborations. The collaborationlead to a pharmacist, a nurse, or both. Given the rising incidence of chronic illnesses and worries about medication safety, it is crucial to comprehend how nurse-pharmacist partnerships could improve medication safety. (Celio et al., 2018).

The medication reconciliation process and safe drug usage

By examining the effectiveness following a community nurse's completion of medication review and medication reconciliation, Foubert et al. (2019) contributed to the improvement of drug safety. medicine indicators (61%), the time of ingestion (9%), the medicine name (18%), usage instructions (6.6%), and dose frequency (0%), were among the variables covered by these schemes. These elements suggest suitable treatments in addition to assisting in the identification of possible side effects and improper prescriptions (Foubert et al., 2019). These modified programs were used by nurses to monitor clinical indicators and educate clients on how to manage chronic illnesses on their own (Foubert et al., 2019). In other research, nurses and pharmacists worked together to directly increase medication safety. For instance, nurses sent patients to pharmacists.

After finding inconsistencies during the reconciliation of medications and attempting to resolve them (Setter et al., 2009). According to Meyer-Massetti et al. (2018), nurse-pharmacist collaborations evaluated prescription quality for ambiguity, contraindications, duplicate drugs, inappropriate prescriptions, and medication supply. This assisted in identifying and averting hospitalizations and adverse occurrences. According to Setter et al. (2009), nurse-pharmacist cooperation resolved 67% of medication inconsistencies. By checking prescription regimens for polypharmacy, we can prevent adverse effects, claim Pherson et al. (2018). According to Pherson et al. (2018), antihypertensives accounted for 23% of the most prevalent pharmaceutical regimens, followed by analgesics (14%), and anticoagulant treatments (13%). Nurse-pharmacist collaborations disposed of unused or expired prescriptions in 16.7% of cases and offered medication management counseling to 41.2% of referrals, according to Lee et al. (2018a). 71.4% of52.5% of the suggestions for drug modifications were accepted by doctors (Lee et al., 2018a). According to their pharmaceutical review, Taylor et al. (2018) discovered that more than 200 client-specific interventions were offered via telepharmacy. Safety (49%), vaccinations (24.5%), care gaps (13.5%), adherence (10%), and cost

savings (3%), were all addressed by the measures. The recommendations were to monitor drug-disease interactions (14%), improper prescriptions (25%), contraindications (4%), and clinical signs (35.9%). (Taylor and colleagues,2018).

RESULTS

Each patient's initial admission was the only one examined. Table 1 displays the demographics of the patients. Nearly 70% of the patients we enrolled were under 65, 65% were Black, 58% resided within 5 miles of the hospital, and the majority were unmarried and covered by Medicare. 7.8 (SD ± 4.9) drugs were taken on average.

Table 1 lists the patients' characteristics.

	Age (years)	**Number of medications per patient**	**Length of stay**
Mean ± SD	55.4 ± 16.6	7.76 ± 4.9	5.72 ± 7.28
Adverse Events	1 (10.0%)	2 (20.0%)	3 (30.0%)

Home Medication Lists (HMLs): The majority of HMLs (52%) were from verbal memory of the patient. Secondary sources were community pharmacists (12.5%) and electronic records (36.6%). Of the 563 patients, 40% experienced at least one unexpected disparity. Compared to release (167), discrepancies were more common during admission (364).

Level of Disparity:

55% of differences were low-risk at admission (Rank 1). 85% of disparities at discharge were classified as moderate-to-high risk (Rank 2-3).From admission to discharge, there was a notable drop in the quantity of inconsistencies.

Medication absences at admission (74%), and discharge (62%), were the most frequent unintended discrepancies, followed by dosage inconsistencies (Fig 2). Rank 1 was assigned to the bulk of omission discrepancies. The most likely classifications for frequency and dosage differences were Rank 2 or 3. Examples of how disparities were rated are shown in Fig 3.

Figure 1:Type of Discrepancy

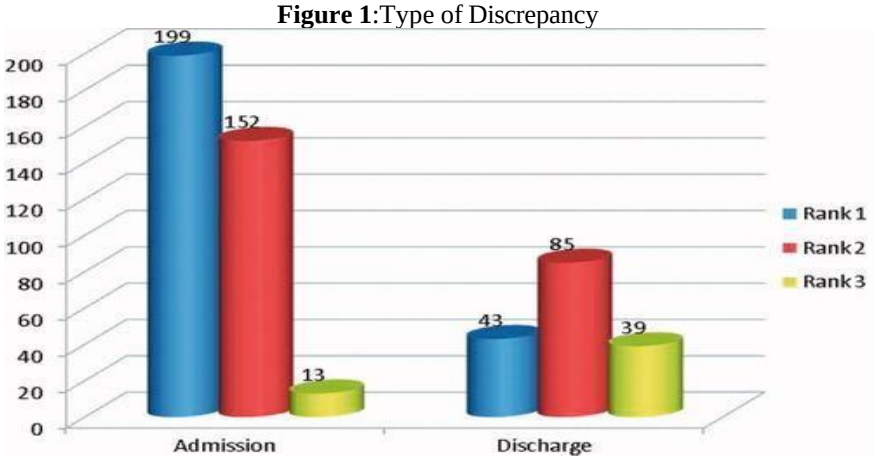

Fig 2:Type of Discrepancy on Admission

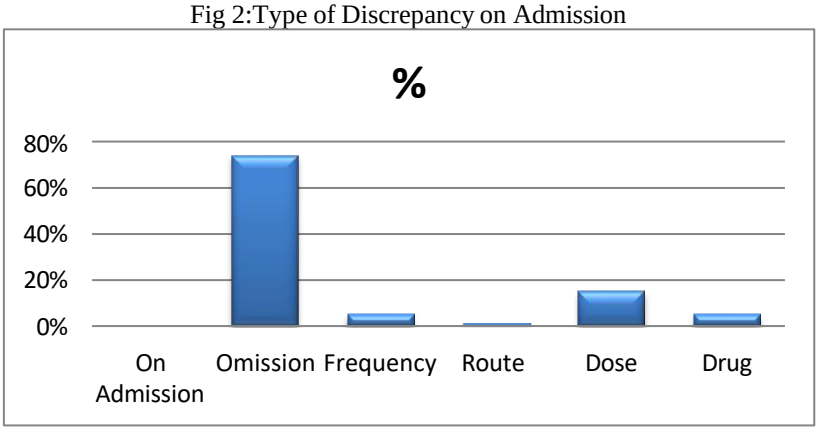

Fig3. Demographic VariablePercentage

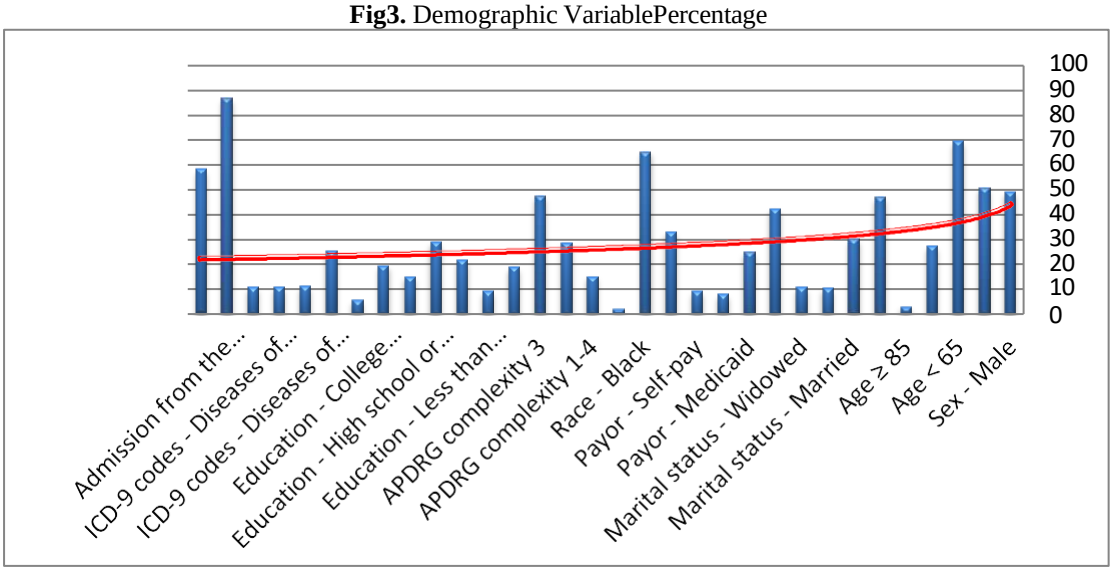

Table 2. Examples of Unintended Discrepancy Ranks

Time of Discrepancy	Medical data
Discharge	An elderly patient suffering from severe cystitis and sepsis. The discharge orders did not include Centrum Silver, which is a component of the HML.
Discharge	The patient had a UTI when they were admitted. Although it wasn't listed on the discharge instructions, the patient's HML contained 100 mg of metoprolol XL.
Admission	The patient was admitted with hypertension. The patient's HML, which called for taking 0.2 mg of clonidine orally three times a day, was left out.

The number of drugs was the sole variable that was statistically substantially linked to the existence of discrepancies (odds ratio, 1.087; 95% CI, 1.044-1.132). The likelihood of a disagreement rose by 8.7% with each more drug. Prevalent disparities were not linked to other factors such as age, race, length of stay, education, marital status, primary payer, or the severity of the illness. Cost Analysis: Utilization, Savings, and Resources The nurses interviewed the admitting patient for an average of 11.2 minutes (SD ± 8.0 minutes). With the first interview excluded, the process took an average of 29.3 minutes (SD ± 30.2 minutes) to complete. Thirty percent of the instances involved consultation with the clinical pharmacist. A consultation lasted 7.5 minutes on average (SD ± 4.4). We calculated the hospital's expenses ofthe intervention by multiplying the time needed by each team member by the hourly pay plus benefits for the doctor, nurse, and pharmacist. Each patient had to pay $31.82 for the intervention. We only took into account Rank 2-3 disparities because Rank 1 discrepancies are harmless. Out of the 563 patients, 122 (29%) had a disparity classified as Rank 2-3. Given that the price of theFinding one inconsistency that could be harmful cost $113.64, and the intervention cost $31.82 per patient. The expenses of the intervention would be mitigated if one discrepancy were avoided in every 290 patient contacts, which would have cost a hospital about $9344 per ADE in 2008. According to our data, we would avoid 81 disparities for every 290 patients. There is no real danger from every possible ADE. The cost of the intervention would be compensated if only 1.2% of the potential ADEs caused harm. According to Bates et al., damage results from 0.9% of all inpatient medication mistakes.Twelve 4.8 of the 531 differences discovered in the current investigation would have been harmful if this rate had been applied. Using the cost adjusted for inflation on these4.8 detrimental differences, a total projected cost saved would be $44,607, which is a good comparison to the nurse-pharmacist intervention's $17,915 cost.

DISCUSSION

For patient safety and to avoid possible adverse drug reactions (ADEs), inpatient medication reconciliation is essential. 40% of patients had at least one ADE at admission or discharge, according to a recent study, with 29% of those ADEs possibly contributing to discomfort or worsening. The most frequent kind of disagreement at admission and discharge was omission; the more medications a patient takes, the more challenging it is for everyone to maintain an accurate record. Unintentional drug inconsistencies are more likely to fall under Rank 2-3 and do not only happen upon admission. The number of discharge discrepancies probably decreased as a result of active medication reconciliation

during admission. (Gleason et al., 2004; Pronovost et al., 2003; Varkey et al., 2007; Vira et al., 2006; Schnipper et al., 2009)

This pilot study showed a very simple, affordable, and generalizable approach to ADE prevention. Using the nurse-pharmacist model may pay for itself or lower medical expenses. A "breakeven" point for the intervention would be reached if only one ADE was prevented for every 290 patient admissions. The study does, however, have a number of drawbacks, such as the absence of a control group, the avoidance of only "potential" adverse drug events, the fact that it was carried out in a single department at a single institution, the use of cost data from an inpatient study that was completed ten years ago, the failure to use the "brown bag" method for determining the Home Medication List (HML), and the lack of control over patient behavior after discharge. (Gleason et al., 2004)

Conclusion

Unintentional medication differences that could be detrimental were common throughout hospitalization and after discharge. Many of these disparities were resolved before they might endanger patients thanks to a nurse-pharmacist partnership that monitored and addressed them. The procedure may increase patient safety, and the partnership was reasonably successful and economical.

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