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Pharmacy-driven refill bag authentication minimizes dispensing error.

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Abstract

Background: Dispensing errors often occurs even though double checks are performed in pharmacy settings. This study aims to evaluate the impact of implementing pharmacy-driven refill bag authentication before handling refilled medications.

Method: Descriptive prospective cohort study conducted for 5 months on patients who refill their medications at KAUH. Pharmacy students collected data by checking the refill bags prior to handling them with the patients.

Results:

The study results in reviewing 972 refill bags with an average number of dispensing errors of 9.36%. The implementation of pharmacy-driven refill bag authentication has demonstrated its efficacy in reducing dispensing errors during medication refill processes.

Conclusion:

This study provides promising evidence for the use of pharmacy-driven refill bag authentication as a strategy for minimizing dispensing errors, as it provides an additional layer of verification and authentication to ensure that the correct medication is dispensed to each patient without causing any harm.

Introduction

A dispensing error refers to a discrepancy between a physician-prescribed prescription and the medication dispensed by the pharmacist to the patient. This discrepancy can potentially impact the patient's condition, although it may not always do so.

Dispensing errors have been attributed to various causes in recent years. In a study titled "Medication Errors and Drug-Dispensing Systems in a Hospital Pharmacy", Edson Perini identified several factors associated with dispensing errors. One significant cause is a communication failure, often resulting from illegible or incomplete prescriptions. Additionally, drug labeling and packaging issues are considered the second most common cause of dispensing errors, with confusion arising from similarities in packaging color and shape. Working conditions, including excessive workload and inadequate medication storage, also contribute significantly to the occurrence of dispensing errors.

In addition to the aforementioned causes, several factors contribute to dispensing errors. These include transcription errors, insufficient attention to drug-related concerns by pharmacists, and the fulfillment of prescriptions based on nurses' requests.

Despite the implementation of double checks in pharmacy settings, dispensing errors remain prevalent, particularly in hospital outpatient pharmacies. These errors can be attributed to both pharmacists responsible for dispensing medications and pharmacy technicians involved in the preparation and labeling processes. Consequently, patients experience a higher incidence of adverse drug reactions,

increased morbidity, and even mortality. Moreover, these errors contribute to elevated costs, resulting in negative consequences for both patients and medical facilities.

This study seeks to address the issue of dispensing errors by implementing a new system that incorporates triple checking prior to dispensing refilled medications in a pharmacy refill clinic. Utilizing this system can help alleviate various problems, including dispensing incorrect medications resulting from packaging similarities, the potential delivery of medication to the wrong patient, and the failure to provide appropriate counseling points to patients, leading to incorrect usage of the prescribed medication.

As part of this study, a pharmacy-led triple-check process will be implemented to effectively mitigate dispensing errors. Adopting this process will not only reduce dispensing errors but also help minimize the associated costs incurred due to medication inaccuracies.

Methods

For a duration of 5 months, we conducted a descriptive prospective cohort study to identify the prevalent dispensing errors in the refill pharmacy of King Abdul-Aziz University Hospital. The study encompassed all patients who visited the refill clinic to replenish their medication. However, patients obtaining their medications directly from the outpatient pharmacy without refills were excluded from the study, as the focus was specifically on errors occurring within the refill pharmacy.

Between August 2022 and December 2022, a team comprising clinical pharmacy students and clinical pharmacists gathered a total of 972 samples from patients of varying ages and nationalities. The data collection took place specifically in the refill pharmacy of King Abdul-Aziz University Hospital.

The study procedure involved a systematic comparison between the prescription and label of each patient's medication in the refill pharmacy and the contents of the refill bag. Data collection was conducted prior to medication dispensing, utilizing a Google form. The form captured information such as the number of medications inside the bag and the occurrence (or absence) of errors. In cases where multiple errors were identified, details were collected regarding the specific type of error. These included instances of incorrect medication prescriptions, medications exceeding the patient's requirements, missing medications despite availability in the pharmacy, incorrect quantities of medication dispensed, medications intended for another patient, and expired or soon-to-be-expired medications within the prescribed therapy duration.

The objective is to mitigate errors related to patient information, medication names, doses, duration, frequency, and route of administration prior to dispensing medications to patients. To achieve this, a new tool, namely the triple-check process, will be implemented specifically for the refill bag in the refill pharmacy. The triple-check process aims to enhance accuracy and verify critical details thoroughly before medication dispensing occurs.

Ethical approval for this research was obtained from the King Abdul-Aziz University Research Ethics Committee, ensuring compliance with ethical guidelines. To uphold the confidentiality of the data and protect participant privacy, anonymity

was strictly maintained. The data analysis of dispensing errors in refill pharmacies was conducted using Microsoft Excel, utilizing a dedicated data collection sheet.

Results

Months	August	September	October	November	December
Number of bags	348	238	219	85	82
Missing medications	5	9	5	1	2
Medication expired or soon-to-be-expired	4	7	0	1	0
Systemic error	1	0	5	0	0
Dispensing error	1	9	2	3	1
Less quantity of medications	0	8	1	1	0
Excess medications	0	7	8	0	0
Medications for another patient	0	3	2	0	3
Medicines refrigerator was out	0	0	1	0	1
Total errors	11	43	24	6	7
Percent of errors in each month	3.16%	18.06%	10.95%	7.05%	8.53%
Percent of errors in 5 months	**9.36%**				

The implementation of pharmacy-driven refill bag authentication has demonstrated its efficacy in reducing dispensing errors during medication refill processes. A comprehensive study covering a period of five months and analyzing 972 refill bags found that the average rate of dispensing errors was 9.36% (Table 1). Notably, variations in error rates were observed across different months, indicating potential factors influencing error occurrence.

Referring to the provided table, the average occurrence of dispensing errors in each month can be observed. In August, out of a total of 348 bags (N=348), the average percentage of errors was 3.16%. This month's most prevalent type of error was the absence of medication that should have been included in the patient's bag.

Conversely, in September, the average error rate was notably higher at 18.06% out of 238 bags (N=238), with missing medication also being the primary type of error in this particular month.

Furthermore, in October, the average percentage of dispensing errors was 10.95% out of 219 bags (N=219). The predominant errors in this month were related to excessive medication being dispensed to patients, in addition to system errors and instances of missing medication. Similarly, in November, the average rate of dispensing errors primarily involving missing medications was 7.05% out of 85 bags (N=85). Moreover, in December, the average error rate stood at 8.53% out of 82 bags (N=82). This month's most frequently encountered error resulted from a labeling error, leading to medication being placed inside the bag intended for another patient.

Discussion

This study aimed to investigate the effectiveness of a pharmacy-led triple-check in reducing dispensing errors and identifying the types of errors occurring in a hospital refill pharmacy when refilling medications. The results showed that an average of 9.36% errors were observed over 5 months. These errors included missing medication, which accounted for a significant portion of the errors observed throughout all months. Also, errors arising from system issues and labeling errors resulting in medication being dispensed to the wrong patient were identified.

Previous studies, such as "Medication Errors and Drug-Dispensing Systems" by Edson Perini and "A Systematic Review of the Nature of Dispensing Errors in Hospital Pharmacies" by Khalid Aldhwaihi, have identified important factors that contribute to dispensing errors, including communication failures and labeling errors. However, these studies note that there is a lack of strategies to minimize such errors.

Our study focuses on pharmacy-driven refill bag authentication as an effective strategy to address the issue of dispensing errors, ultimately improving patient safety and reducing medication wastage, which subsequently lowers the costs associated with hospital refill pharmacies.

It is important to acknowledge the limitations of our study, which include its nature as a single-site investigation conducted within a hospital refill pharmacy over a relatively short period. Furthermore, while implementing pharmacy-driven refill bag authentication may effectively reduce dispensing errors, it may also pose challenges related to staff training and workflow adjustments that must be considered.

Overall, this study offers promising evidence supporting the implementation of pharmacy-driven refill bag authentication as a strategy to minimize dispensing errors. By providing an additional layer of verification and authentication, this approach ensures accurate medication dispensing to each patient, thereby mitigating the risk of harm.

Conclusion

This observational study highlights the significant challenge of dispensing errors to patient safety and healthcare professionals in hospital refill pharmacies. The objective of this study was to achieve a significant reduction in dispensing errors, aiming for a target of zero, through the implementation of a pharmacy-led triple-check process.

Furthermore, the findings of this study hold significant implications for healthcare professionals, patients, and medical facilities alike. It is imperative to continue exploring and implementing innovative strategies that enhance patient safety and reduce the costs associated with dispensing errors. Future research in this field could concentrate on evaluating the effectiveness of this strategy in various hospital settings, encompassing longer study periods and different categories of medication.

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