



## PHARMACIST INTERVENTIONS IN REDUCING MEDICATION ERRORS

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### Abstract:

**Background:** Medication errors are a pervasive issue in healthcare systems worldwide, posing a serious threat to patient safety. These errors can lead to prolonged hospitalization, increased treatment costs, and even death. Despite efforts to address this problem, medication errors remain a significant concern, with substantial financial implications for the healthcare sector. Health care professionals involved in the medication process, including physicians, nurses, and pharmacists, are susceptible to experiencing psychological distress due to errors, which can impact patient care and clinical confidence.

**Objective:** This review aims to evaluate the effectiveness of pharmacist interventions in reducing medication errors in hospital settings, assess the types and frequency of medication errors despite these interventions, identify common contributing factors for errors, determine the impact of pharmacist interventions on patient outcomes, and provide recommendations for best practices in pharmacist interventions to enhance patient safety.

**Conclusion:** Medication errors present a considerable risk to patient well-being, emphasizing the critical role of pharmacists in optimizing drug therapy and enhancing patient safety. Various risk factors, including human, system-related, and environmental factors, contribute to medication errors, necessitating the implementation of strategies to mitigate these risks. Different types of medication errors can occur, underscoring the need for improved processes and technologies to enhance medication safety. Pharmacist interventions have demonstrated effectiveness in reducing hospital readmissions and adverse drug events, highlighting the value of their involvement in patient care. Collaborative efforts among healthcare professionals, institutions, and policymakers are essential to foster a culture of accountability, address the root causes of medication errors, and improve patient safety in healthcare settings.

**Keywords:** Pharmacists related interventions, Medication errors, risk factors, inappropriate prescribing.

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**Introduction:**

Medication errors represent a fundamental challenge within healthcare systems globally, posing a significant threat to patient safety [1]. The repercussions of medication errors can be severe, leading to prolonged hospital stays, escalated treatment expenses, and in the worst cases, fatalities. A survey conducted in the United Kingdom in 2018 revealed that over 2 million individuals suffer from the repercussions of medication errors annually, resulting in nearly 100,000 deaths [2]. Alarmingly, medication errors rank as the third leading cause of death in the United States. Apart from eroding patient trust in medical services and the healthcare system, these errors impose substantial financial burdens on the healthcare sector. Studies have shown that the cost per medication error can range from €2.58 to €111,727.08 [3].

Medication error encompasses any mishap in the medication process, including prescription, preparation, and administration to the patient, irrespective of whether it leads to adverse effects. Errors can manifest at any stage of the drug therapy cycle, from prescription to administration, with a predominant occurrence during medication delivery to the patient [4]. Various stakeholders, including physicians, nurses, pharmacists, patients, and their families, contribute to medication errors. Hospitals, in particular, witness a higher frequency of errors during medication order implementation, implicating all healthcare professionals in error occurrences [5].

Healthcare professionals grappling with medication errors often experience profound psychological distress, such as anger, guilt, depression, and even thoughts of suicide. The looming threat of legal repercussions can exacerbate these emotions, leading to a loss of clinical confidence [6]. The fear of punitive measures discourages healthcare workers from reporting errors, despite concerns for patient safety, potentially heightening the risk of severe harm. Institutional policies that foster an adversarial climate further deter staff from reporting errors, fostering a culture of secrecy that perpetuates the cycle of medical errors. Collaborative efforts among governmental, legal, and medical bodies are imperative to dismantle the blame culture while upholding accountability. By addressing this challenge, healthcare institutions can proactively pursue process improvements, including error mitigation, without fear of retribution [7, 8].

**Objectives:**

The main objectives of this review are:

1. To evaluate the effectiveness of pharmacist interventions in reducing medication errors in a hospital setting.
2. To assess the types and frequency of medication errors that occur despite pharmacist interventions.
3. To identify common factors contributing to medication errors that could be targeted for improvement.
4. To determine the impact of pharmacist interventions on patient outcomes, such as hospital readmissions or adverse drug events.
5. To make recommendations for best practices in pharmacist interventions to reduce medication errors and improve patient safety.

**The role of pharmacists in reducing medication errors:**

Pharmacists are widely recognized as essential members of the healthcare system, collaborating with various healthcare professionals in a multidisciplinary approach to deliver optimal patient care. Their pivotal role spans across different healthcare settings, including hospital multidisciplinary teams, nursing homes, and primary care settings, where they contribute significantly to medication processes and patient safety [9].

Studies have highlighted the crucial role of pharmacists in enhancing patient care by preventing medication errors before they reach patients, addressing approximately three-quarters of such errors. This underscores the importance of pharmacists in optimizing drug therapy and medication management to ensure patient safety and quality of care. The impact of pharmacists in averting medication misadventures is quantifiable through their interventions, which go beyond error prevention to encompass a range of services that benefit patients [10].

In the evolving landscape of pharmaceutical care, pharmacists have pioneered various patient safety strategies that have been instrumental in enhancing patient safety within the healthcare system. Their responsibilities are diverse, ranging from empowering patients with drug information to educating them on the correct usage of medications to prevent adverse drug events during hospitalization or post-discharge [11]. Evidence from a clinical trial conducted in critical care settings demonstrated that pharmacist involvement in patient care led to a remarkable three- to five-fold reduction in medication errors.

**Risk factors contributing to medication errors:**

Medication errors pose a significant threat at every stage of the medication process, from prescription to administration, potentially resulting in adverse drug events, patient harm, and increased healthcare costs. Several factors contribute to the occurrence of medication errors, including human factors, system-related issues, and environmental factors [12]. Human factors such as fatigue, stress, lack of expertise, distractions, and ineffective communication among healthcare professionals can heighten the risk of medication errors. System-related issues like unclear medication labeling, illegible prescriptions, absence of standardized protocols, and inadequate staff training also significantly contribute to medication errors. Environmental factors such as heavy workloads, interruptions, poor lighting, and chaotic work settings further compound the risk of medication errors [13]. Patient-related factors such as age, multiple comorbidities, polypharmacy, and limited health literacy can also increase patients' susceptibility to medication errors.

Healthcare organizations play a crucial role in mitigating these risk factors and enhancing medication safety by implementing various strategies. These include the adoption of electronic prescribing systems, barcoding technology, medication reconciliation processes, standardized protocols, and fostering interdisciplinary teamwork [14]. By addressing these factors comprehensively, healthcare providers can work towards minimizing medication errors and improving patient outcomes.

**Types and frequency of medication errors:**

There exist various categories of medication errors that can manifest, each possessing distinct attributes and potentials for harm. An example of such an error involves the incorrect prescription of medications, which can result from factors like indecipherable handwriting, similarities in drug names that look or sound alike, or confusion between medications sharing similar names. Another form of error pertains to the administration of an inaccurate dosage of a medication, possibly stemming from erroneous calculations, misinterpretation of orders, or errors in programming automated medication dispensing systems. Furthermore, errors may arise when medications are not administered at the designated time or frequency, potentially leading to suboptimal treatment outcomes or jeopardizing patient well-being [15].

The frequency of medication errors varies across healthcare settings, with certain studies suggesting that errors occur in up to 5% of medication orders

within hospital environments. However, the actual prevalence of errors might be higher due to underreporting or the absence of standardized reporting mechanisms. Various factors have been pinpointed as contributors to medication errors, including deficient communication among healthcare providers, inadequate access to comprehensive patient information, high workloads and fatigue among healthcare personnel, and a reliance on memory or handwritten notes for medication orders [16].

Initiatives aimed at mitigating medication errors have centered on the implementation of systems and protocols to enhance medication safety, such as computerized physician order entry systems, barcode medication administration systems, and medication reconciliation procedures [17]. These technological solutions aid in error reduction by furnishing decision support to healthcare providers, cross-verifying medication orders against patient data, and documenting medication administration in real time. Additionally, healthcare institutions have adopted strategies like standardizing medication labeling and packaging, conducting medication safety training for staff, and fostering a safety culture that promotes error reporting and learning [18].

**Impact of pharmacist interventions on patient outcomes:**

A pivotal manner in which pharmacist interventions can influence patient outcomes is by diminishing the incidence of hospital readmissions. Medication errors stand out as a primary cause of hospital readmissions, as patients may encounter complications or deterioration in their condition due to the incorrect or inappropriate utilization of medications [19]. Pharmacists can avert these errors by conducting medication reconciliation during patient hospitalization, ensuring the accuracy and currency of their medication regimens. Through close collaboration with healthcare teams to optimize medication therapy and monitor patient responses to treatment, pharmacists can reduce the likelihood of readmissions linked to medication-related issues [20].

Apart from curbing hospital readmissions, pharmacist interventions can also help in lowering the occurrence of adverse drug events, which encompass harmful or unintended reactions to medications. Adverse drug events can arise from medication errors like incorrect dosing, drug interactions, or allergic responses, potentially leading to severe consequences for patients, including hospitalization and enduring health complications [21]. Pharmacists play a pivotal role

in preventing adverse drug events by conducting medication reviews, identifying potential risks, and working in tandem with healthcare providers to adjust treatment plans as necessary. By monitoring patients for signs of adverse drug reactions and offering education on medication side effects, pharmacists can diminish the likelihood of these events and enhance patient safety [22].

### Conclusion:

In conclusion, medication errors pose a significant threat to patient safety and can lead to adverse outcomes such as prolonged hospitalization, increased treatment costs, and even death. The role of pharmacists in reducing medication errors is crucial, as they play a key role in optimizing drug therapy, medication management, and improving patient safety. Risk factors contributing to medication errors include human factors, system-related issues, and environmental factors, highlighting the importance of implementing strategies to mitigate these risks. Various types of medication errors can occur, emphasizing the need for improved processes and technologies to enhance medication safety. Pharmacist interventions have shown promise in reducing hospital readmissions and adverse drug events, underscoring the value of their involvement in patient care. Collaborative efforts among healthcare professionals, institutions, and policymakers are essential to address the culture of blame, promote accountability, and enhance patient safety in healthcare settings.

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