**Review Article**

**PHARMACIST-LED MEDICATION RECONCILIATION INTERVENTIONS IN HOSPITAL SETTINGS: A SYSTEMATIC REVIEW**

**ABSTRACT:**

Medication errors during critical transition points in patient care—such as hospital admissions, intra-hospital transfers, and discharges—remain a significant challenge to ensuring patient safety and optimal therapeutic outcomes. Pharmacist-led medication reconciliation programs have emerged as a pivotal strategy to mitigate these errors by systematically reviewing and verifying patients’ medication histories, identifying discrepancies, and facilitating accurate communication among healthcare providers. This systematic review integrates findings from eight peer-reviewed studies that evaluated the impact of pharmacist-led medication reconciliation interventions across diverse hospital environments, including tertiary care, teaching hospitals, and specialized units. The evidence consistently demonstrates that these interventions lead to a substantial reduction in medication discrepancies, enhanced patient safety, improved adherence to prescribed therapy, and strengthened interdisciplinary collaboration. Moreover, the review highlights various implementation strategies, methodological approaches, and outcome measures that contribute to the effectiveness of these programs. The findings underscore the importance of incorporating pharmacist-led medication reconciliation into standard hospital practice and provide actionable recommendations for broader adoption to optimize patient care and minimize medication-related risks.

**KEYWORDS:** Medication reconciliation, Pharmacist intervention, Medication safety and Hospital transitions.

**INTRODUCTION**

Medication reconciliation is a systematic process in which healthcare professionals collaborate with patients, their families, and other members of the care team to ensure accurate and complete transfer of medication information during transitions of care. This process involves a comprehensive review of a patient’s preadmission medications and a comparison with current in-hospital prescriptions to verify any additions, modifications, or discontinuations. The primary goal of medication reconciliation is to confirm appropriate medication use, identify and resolve unintended discrepancies, and thereby reduce the risk of medication errors during critical points of care.

Medication reconciliation should be conducted at every transition of care, particularly when new medications are initiated or existing orders are adjusted. An accurate and detailed medication list—encompassing drug names, dosages, frequencies, and routes of administration—is prepared upon hospital admission to help detect preventable errors such as therapy duplication, dosing inaccuracies, omissions of clinically indicated medications, inappropriate commissions, and potential drug–drug interactions. Discrepancies identified during this process may be classified as intentional (e.g., documentation errors) or unintentional, with transitions of care presenting a high-risk period for such errors, potentially leading to adverse drug events, increased healthcare costs, and compromised patient outcomes.

Pharmacists, given their specialized knowledge in pharmacotherapy, are particularly well-suited to lead medication reconciliation initiatives. Their active involvement in obtaining patient medication histories, reviewing prescriptions, and participating in hospital rounds has consistently been associated with reduced medication discrepancies and improved patient safety compared with histories obtained by other healthcare providers. As integral members of the healthcare team, pharmacists play a critical role in ensuring the safe and effective use of medications, identifying potential errors, and resolving discrepancies in a timely manner.

This review synthesizes evidence from eight studies evaluating the impact of pharmacist-led medication reconciliation in hospital settings.

**ROLE OF PHARMACIST IN MEDICATION RECONCILIATION:**

**1. Collecting Accurate Medication History**

* Interviewing patients and caregivers to obtain a complete list of current medications (prescription, OTC, herbal, supplements).
* Reviewing previous records, prescription databases, and community pharmacy records to cross-check accuracy.

**2. Identifying and Resolving Discrepancies**

* Comparing the patient’s pre-admission medication list with inpatient orders.
* Detecting omissions, duplications, wrong doses, drug interactions, and contraindications.
* Clarifying unclear prescriptions with physicians or nurses.

**3. Documentation and Communication**

* Recording verified medication lists in patient charts or electronic health records.
* Communicating any changes to the healthcare team and providing clear discharge instructions.

**4. Patient and Caregiver Education**

* Explaining any changes in therapy and reasons for discontinuation or initiation of medications.
* Teaching correct administration techniques, storage, and adherence strategies.

**5. Supporting Transitions of Care**

* Ensuring continuity of therapy during transfers between wards, hospitals, or post-discharge.
* Liaising with community pharmacies or primary care providers to avoid gaps in therapy.

**6. Quality Improvement and Leadership**

* Developing and updating medication reconciliation policies and workflows.
* Training and supervising pharmacy students, residents, and technicians in reconciliation activities.
* Participating in audits and research to improve MR processes.

**OBJECTIVES OF THE STUDY:**

* To evaluate the impact of pharmacist-led medication reconciliation on the identification and resolution of medication discrepancies, as well as on related clinical and process outcomes across various hospital settings.
* To analyze the key risk factors contributing to medication discrepancies.
* To delineate the roles and responsibilities of pharmacists, pharmacy students, and pharmacy technicians in the reconciliation process.
* To identify factors that facilitate or hinder implementation, including the role of technology in supporting medication reconciliation.
* To formulate evidence-based recommendations for best practices in pharmacist-led medication reconciliation.

**METHODS:**

This systematic review employed a structured methodology to identify and critically evaluate studies examining pharmacist-led medication reconciliation (MR) in hospital environments. The review adhered to PRISMA guidelines to ensure methodological transparency and rigor. Comprehensive literature searches were performed across databases including PubMed, Google Scholar, ScienceDirect, and Elsevier, using keywords such as “medication reconciliation,” “pharmacist intervention,” “hospital transitions,” “patient safety,” and “clinical pharmacy.”

The selection process involved initial identification of relevant articles, removal of duplicates, screening of titles and abstracts, and full-text assessment against predefined inclusion criteria. Studies were considered eligible if they described pharmacist- or pharmacy team-led MR programs in hospital settings and reported outcomes such as the number and type of medication discrepancies, patient satisfaction, or hospital readmission rates. Data extraction focused on study characteristics including design, setting, participant population, pharmacist involvement, and reported outcomes.

The final review included eight studies encompassing observational designs, randomized controlled trials, and a meta-analysis, covering diverse hospital areas such as emergency departments, surgical wards, internal medicine units, and discharge settings. Extracted data were analyzed qualitatively and presented using tables and charts to facilitate clear synthesis and comparison of findings.

**Inclusion Criteria:**

Studies were considered for inclusion if they were published in English and focused on hospital-based medication reconciliation interventions conducted by pharmacists or pharmacy teams. Eligible studies were required to report outcomes related to medication discrepancies, the clinical significance of these discrepancies, patient or caregiver satisfaction, and hospital readmission rates.

**Exclusion Criteria:**

Studies were excluded if they were conducted outside hospital settings, involved medication reconciliation interventions led solely by physicians or nurses without pharmacist participation, or were publications such as reviews, case reports, or editorials.

**RESULT:**

**1. Medication Discrepancies Identified:** Pharmacist-led interventions consistently revealed a significant prevalence of medication discrepancies across various hospital settings. In one study, Karaoui et al. identified 195 discrepancies among 204 patients, demonstrating nearly one discrepancy per patient. Digiantonio et al. reported an even higher burden, detecting 1,762 discrepancies in a cohort of 200 patients. Smith et al. documented 290 discrepancies across 1,045 prescribed medications, highlighting the widespread nature of these errors. Similarly, Poornima et al. found that 74 out of 80 patients in the emergency department had at least one medication discrepancy, with a clear association observed between the number of medications prescribed (polypharmacy) and the likelihood of discrepancies. These findings underscore the critical role of pharmacists in detecting and resolving medication-related errors, particularly in patients with complex medication regimens.

**2. Clinical Significance of Discrepancies:** The proportion of clinically significant medication errors differed across studies but remained substantial in all cases. Karaoui et al. reported that 36% of identified discrepancies had clinical importance, while Digiantonio et al. found that 68% of discrepancies were classified as either significant or serious. Supporting these findings, Mekonnen et al.’s meta-analysis demonstrated that pharmacist-led medication reconciliation reduced clinically relevant discrepancies by approximately 66% compared with standard care, highlighting the effectiveness of pharmacist involvement in minimizing potentially harmful medication errors.

**3. Setting-Specific Insights**

* **Emergency department:** Early pharmacist or student-pharmacist involvement improved completeness of medication histories and patient satisfaction, with signals of reduced revisit/readmission.
* **Surgical wards:** Pharmacist participation identified unintentional omissions and dose errors relevant to perioperative safety.
* **Renal/Haemodialysis:** Formal MR programs detected discrepancies with potential to avert ADEs in high-risk populations.
* **Internal medicine and general wards:** Systematic pharmacist MR at admission and discharge consistently reduced discrepancies and supported safer transitions.

**4. Impact of Pharmacy Team Involvement:** Several studies highlighted the contributions of pharmacy students and technicians in medication reconciliation. Okere et al. demonstrated that involvement of student pharmacists in the emergency department not only reduced medication discrepancies but also improved patient satisfaction and lowered hospital readmission rates. Similarly, Elamin et al. and Abu Hammour et al. reported that multidisciplinary pharmacy teams, including students and technicians, enhanced clinical outcomes in surgical and internal medicine settings, underscoring the value of collaborative pharmacy-led interventions in improving patient care.

**5. Overall Effectiveness:** Collectively, evidence from all eight studies underscores the significant impact of pharmacist-led medication reconciliation in minimizing medication errors, enhancing patient safety, and facilitating effective communication during transitions of care. These interventions have proven to be adaptable across diverse hospital settings and are consistently supported by robust evidence demonstrating their clinical and operational benefits.

**DISCUSSION:**

The collective findings from the studies included in this systematic review highlight the pivotal role of pharmacist-led medication reconciliation (MR) in enhancing patient safety within hospital settings. Pharmacists, by virtue of their expertise in pharmacotherapy, are uniquely positioned to identify, resolve, and prevent medication discrepancies across all stages of patient care transitions. Through meticulous collection of comprehensive medication histories, careful evaluation of prescriptions, and close collaboration with multidisciplinary healthcare teams, pharmacist-led MR programs effectively reduce the risk of adverse drug events. The evidence demonstrates that these benefits are consistent across multiple hospital departments, including internal medicine, surgical units, and emergency care, underscoring the versatility and broad applicability of these interventions. The involvement of pharmacy students and technicians, under appropriate supervision, further strengthens MR initiatives. These team members assist in gathering medication histories and conducting preliminary checks, allowing pharmacists to dedicate more attention to complex clinical decisions, patient counseling, and therapeutic optimization. Such a layered, collaborative approach not only improves operational efficiency but also fosters skill development and experiential learning among the pharmacy workforce.

Despite these positive outcomes, several challenges constrain the full potential of MR programs. Variability in implementation across institutions can lead to inconsistent practices, while time limitations, staffing shortages, and restricted access to integrated electronic health records present additional obstacles. To overcome these barriers, successful MR programs require standardized protocols, adequate resourcing, and strong interprofessional collaboration. The strategic use of technology—including electronic health records, automated alerts, and shared medication databases—can enhance accuracy and workflow efficiency. Continuous training and professional development for pharmacists, technicians, and students are essential to sustain high-quality reconciliation practices.

Future research should focus on evaluating the cost-effectiveness of MR programs, exploring innovative models for implementation, and expanding reconciliation practices to resource-limited settings. By addressing these areas, healthcare systems can maximize patient safety, optimize therapeutic outcomes, and improve overall efficiency in medication management during hospital transitions.

**CONCLUSION:**

Pharmacist-led medication reconciliation is a critical strategy for enhancing medication safety during hospital transitions. Evidence from the eight reviewed studies demonstrates that pharmacists effectively reduce medication discrepancies, correct clinically significant errors, improve patient satisfaction, and lower readmission rates across diverse hospital settings. The inclusion of pharmacy students and technicians under supervision further extends service coverage and supports workload management without compromising accuracy. Key barriers, such as process variability, staffing limitations, time constraints, and incomplete electronic health record integration, highlight the need for standardized protocols, institutional support, training, and interdisciplinary collaboration to optimize program effectiveness.

**COMPETING INTERESTS DISCLAIMER:**

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

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