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IMPACT OF PHARMACIST-LED MEDICATION RECONCILIATION ON MEDICATION DISCREPANCIES AND PATIENT SAFETY DURING TRANSITIONS OF CARE: AN UPDATED SYSTEMATIC REVIEW AND QUANTITATIVE DESCRIPTIVE SYNTHESIS

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ABSTRACT

Medication discrepancies are common during admission, transfer, and discharge. Pharmacists and pharmacy technicians can obtain best possible medication histories, identify discrepancies, communicate corrections, counsel patients, and support post-discharge continuity. To synthesize contemporary international and Saudi evidence on the effectiveness of pharmacist- or pharmacy-led medication reconciliation for reducing medication discrepancies, clinically important medication errors, and subsequent healthcare utilization during transitions of care. An updated PRISMA 2020-aligned systematic-review draft was developed from PubMed-indexed and publisher-verified reports available through 29 August 2026. Comparative and implementation studies involving adult transitions of care and pharmacist/pharmacy-team medication reconciliation were

mapped. Outcomes, settings, sample sizes, effects, and limitations were extracted. Because outcome definitions, intervention components, transition points, and effect measures were heterogeneous, estimates were synthesized narratively and displayed descriptively without a new pooled meta-analysis. Twelve core reports were included in the current evidence map, five from Saudi Arabia. A prior meta-analysis of 19 studies found fewer patients with discrepancies after single-transition interventions (RR 0.34, 95% CI 0.23–0.50), but not conclusively after multiple-transition interventions (RR 0.88, 95% CI 0.77–1.02). Saudi studies consistently identified high discrepancy burdens, with 42.4%–48.3% of selected admissions having at least one unintended discrepancy. A 2024 pragmatic controlled trial reported clinically important discharge errors in 9.3% versus 61.9%, but no improvement in 30-day utilization. Across studies, evidence was stronger for medication-process outcomes than for readmission or emergency utilization. Pharmacist-led medication reconciliation improves detection and reduction of medication discrepancies, particularly at a clearly defined admission or discharge transition. Evidence that reconciliation alone reduces readmission or emergency utilization remains inconsistent. Saudi multicenter trials should integrate medication reconciliation with discharge counseling, communication, follow-up, and risk stratification while measuring patient-level harm and utilization.

KEYWORDS: Medication Reconciliation; Pharmacist; Pharmacy Technician; Medication Discrepancy; Medication Error; Patient Safety; Transitions Of Care; Saudi Arabia.

1. INTRODUCTION

Transitions of care are vulnerable to medication omissions, commissions, dose or frequency errors, duplications, and undocumented changes. The process is especially complex in older adults, patients with polypharmacy, and those moving between acute, intensive, surgical, and community settings. Medication reconciliation aims to create an accurate medication list, compare it with current orders, resolve unintended differences, document decisions, and communicate the final plan.

Pharmacists are well positioned to lead this work because they combine medication-history skills, pharmacotherapy knowledge, access to multiple information sources, and communication with prescribers, nurses, patients, caregivers, and community pharmacies. Pharmacy technicians and trainees can extend capacity when roles, supervision, escalation criteria, and documentation standards are explicit.

Saudi evidence demonstrates both need and opportunity. Prospective studies have found unintended discrepancies in more than two-fifths of selected admissions, with omissions consistently the most frequent type. However, implementation studies often lack concurrent controls and focus on discrepancies detected rather than prevented harm. An updated synthesis is therefore useful for designing services at King Abdulaziz Medical City and other regional hospitals.

2. METHODS

2.1 Review design and reporting framework

This manuscript is an updated systematic-review draft aligned with PRISMA 2020. It distinguishes completed evidence mapping from author-team activities still required for a submission-grade review. No protocol registration number is claimed.

2.2 Eligibility criteria

Domain	Eligibility
Population	Adults receiving care at admission, intrahospital transfer, discharge, or early post-discharge follow-up.
Intervention	Medication reconciliation led or materially delivered by a pharmacist, pharmacy technician, resident, intern, or supervised pharmacy team.
Comparator	Usual care, another reconciliation model, before–after comparison, or implementation assessment where comparative evidence was unavailable.
Outcomes	Medication discrepancies/errors, clinical importance, intervention acceptance, adverse drug events, readmission, emergency visits, utilization, and patient experience.
Design	Randomized, controlled, cohort, prospective implementation, and relevant systematic review/meta-analysis reports.
Exclusions	Medication review without reconciliation, purely technical descriptions, pediatric-only evidence unless separable, non-healthcare settings, and reports without evaluable outcomes.

2.3 Search strategy and selection

PubMed was searched using combinations of medication reconciliation, pharmacist, pharmacy technician, transition, admission, discharge, discrepancy, medication error, readmission, Saudi Arabia, Gulf, and GCC.

References and DOI/publisher records were used to verify bibliographic information. A final journal submission must reproduce searches in at least MEDLINE/PubMed, Embase, CINAHL, Scopus or Web of Science, and the Cochrane Library, followed by deduplication and independent duplicate screening.

2.4 Extraction, appraisal, and synthesis

Extracted fields included geography, design, transition point, intervention, sample, outcome, main finding, risk-of-bias concern, DOI, and verification URL. Randomized trials should be appraised with RoB 2 and non-randomized interventions with ROBINS-I. The present certainty labels are provisional.

A new pooled meta-analysis was not conducted because estimates differed in outcome definition, transition point, design, intervention intensity, and effect measure. Selected compatible-looking estimates are displayed only to visualize direction and uncertainty, not as a pooled result.

3. RESULTS

3.1 Evidence profile

The current evidence map contains 12 core reports spanning prior systematic reviews, controlled trials, prospective implementation studies, and retrospective assessments.

Figure 1 shows the distribution by broad evidence type; five reports were conducted in Saudi Arabia.

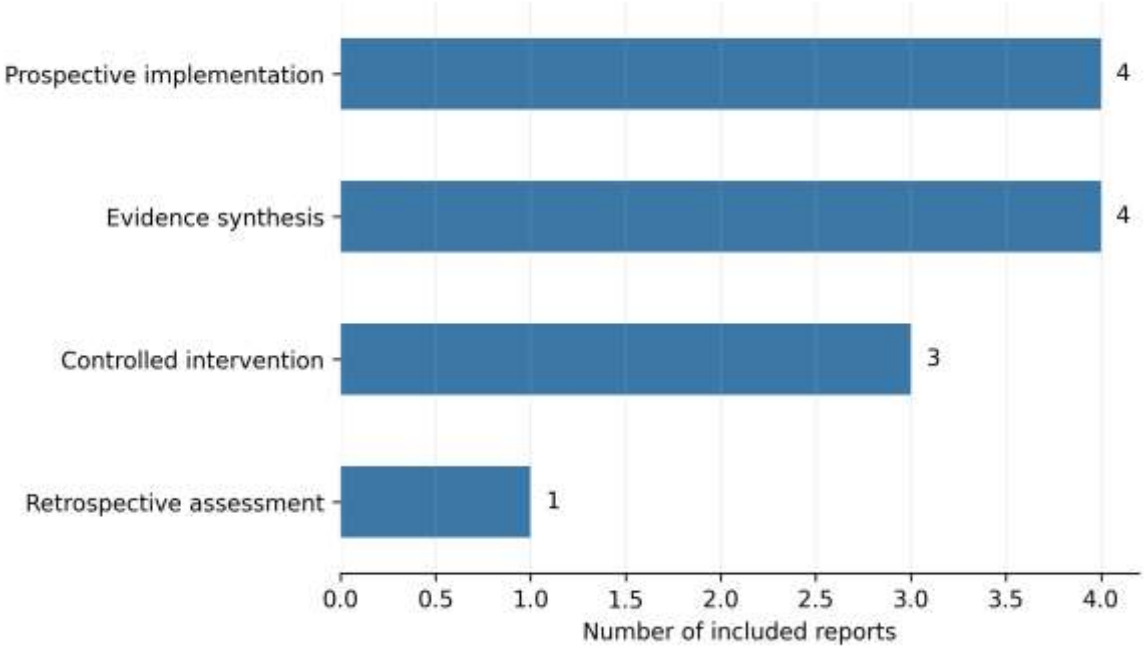

Figure 1. Distribution of included reports by evidence type.

3.2 Characteristics of included evidence

Study	Setting	Design	Sample	Key result
Mekonnen et al. (2016)	International	Systematic review/meta-analysis	19 studies; 15,525 adults	Single-transition interventions reduced patients with discrepancies (RR 0.34, 95% CI 0.23–0.50); multiple-transition interventions were not statistically conclusive (RR 0.88, 0.77–1.02).
Mekonnen et al. (2016)	International	Systematic review/meta-analysis	17 studies	Programs were associated with lower post-hospital utilization, with variation by intervention intensity and setting.
Al-Jazairi et al. (2017)	Saudi Arabia	Prospective program evaluation	374 patients; 1,000 encounters	260 discrepancies; 69.6% occurred at admission; 76.9% of recommendations accepted and the remainder accepted with modification.
Abdulghani et al. (2018)	Saudi Arabia	Prospective observational	286 adults	48.3% had at least one unintended discrepancy; omissions were 77%; 52% had potential for moderate-to-severe discomfort.
Mazhar et al. (2018)	Saudi Arabia	Prospective single-center	375 adults aged ≥65	151 patients (42.4%) had ≥1 unintended discrepancy; 60% had potential for temporary harm or prolonged hospitalization.
Redmond et al. (2018)	International	Cochrane systematic review	25 studies; 6,995 participants	Evidence for clinically important outcomes was uncertain because of heterogeneity and generally low-certainty evidence.
Cheema et al. (2018)	International	Systematic review/meta-analysis	17 studies	Reduced medication discrepancies, but no consistent reduction in readmission was demonstrated.
Alghamdi et al. (2022)	Saudi Arabia	Prospective pilot	182 patients	102 discrepancies (0.7/patient); omission was most common; follow-up recipients reported high satisfaction.
Bajeux et al. (2022)	France	Controlled study	Patients aged ≥65	No clear effect on 30-day utilization; medication process quality improved.
Jošt et al. (2024)	Slovenia	Pragmatic prospective controlled trial	414 patients	Clinically important errors: 9.3% intervention vs 61.9% control; no reduction in unplanned utilization.
Jošt et al. (2024)	Slovenia	Pragmatic controlled follow-up	254 patients	Clinically important unintentional patient-generated discrepancies were less likely (OR 0.204, 95% CI 0.093–0.448).

Alatmi et al. (2025)	Saudi Arabia	Retrospective cohort	121 patients	216 discrepancies; only 19% of patients had no discrepancy; omission accounted for 33.7%.

3.3 Medication discrepancy outcomes

The most consistent finding was improvement in medication-process outcomes. Mekonnen et al. reported a 66% relative reduction in patients with discrepancies for pharmacy-led reconciliation focused on a single transition. In the 2024 pragmatic trial, clinically important discharge errors were 9.3% with routine pharmacist-led reconciliation and counseling versus 61.9% with usual care. Saudi studies showed that omissions were the dominant discrepancy and that a substantial proportion had potential clinical importance.

3.4 Healthcare utilization and patient-centered outcomes

Effects on readmission, emergency attendance, and composite unplanned utilization were inconsistent. The pragmatic Jošt trial did not improve 30-day utilization despite a major reduction in discharge errors. Similar reviews concluded that reconciliation improves discrepancy outcomes more reliably than downstream utilization. This suggests that reconciliation is necessary but may be insufficient without timely access to medications, patient understanding, follow-up, and communication across settings.

3.5 Quantitative descriptive display

Figure 2 presents selected published or transparently calculated relative effects. The estimates are not pooled. They differ by outcome, transition, and effect measure, and their alignment on one axis is intended only to show direction and uncertainty.

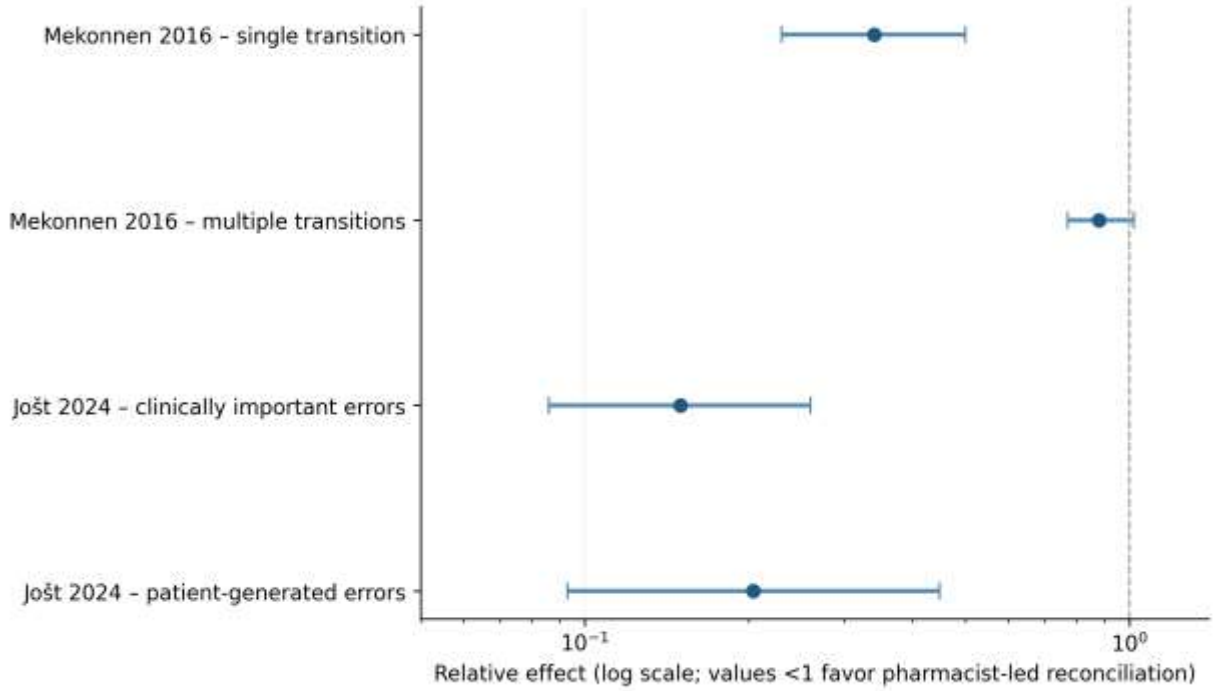

Figure 2. Selected effect estimates for pharmacist-led medication reconciliation; no pooled estimate.

3.6 Saudi and NGHA relevance

The Saudi studies are directly relevant to local implementation. At King Abdul-Aziz Medical City/NGHA, a prospective study of 375 older adults found 226 unintended discrepancies and 42.4% of patients with at least one. Completion within 24 hours was associated with fewer discrepancies. These findings support risk-based prioritization, early best possible medication history, clear pharmacist-technician workflows, documentation within the electronic record, and escalation of clinically important differences.

3.7 Risk of bias and certainty

Confidence is moderate for reducing medication discrepancies and lower for preventing utilization or serious harm. Common limitations include single-center designs, selection of high-risk populations, incomplete blinding, inconsistent definitions,

intervention contamination, bundled services, short follow-up, and reliance on detected discrepancies as a surrogate. Implementation studies without control groups demonstrate feasibility and burden but cannot establish causal effectiveness.

4. DISCUSSION

The evidence supports pharmacist-led medication reconciliation as an effective medication-safety process, particularly when assigned to a discrete admission or discharge transition. The effect is most convincing for accuracy of medication lists and clinically important discrepancies. By contrast, readmission and emergency utilization depend on many factors beyond reconciliation, which plausibly explains weaker and inconsistent findings.

An effective model should not be reduced to form completion. Core components include a best possible medication history using multiple sources, explicit comparison with orders, prescriber communication, documentation of intentional changes, patient counseling in understandable language, communication of the final list to the next provider, and follow-up for high-risk patients. Pharmacy technicians can collect structured histories and resolve information gaps under protocols, while pharmacists retain clinical assessment and escalation responsibilities.

For NGHA, a phased program could prioritize older adults, polypharmacy, high-risk medicines, recent hospitalization, ICU/cardiac transitions, and patients with language or health-literacy barriers. Process measures should include completion within 24 hours, discrepancies per patient, clinically important discrepancies resolved, prescriber acceptance, and communication of the reconciled list. Balancing and outcome measures should include time burden, delayed discharge, adverse drug events, 30-day utilization, and patient understanding.

4.1 Strengths and limitations

This review integrates international effectiveness evidence with Saudi implementation evidence and provides an auditable extraction workbook. It avoids an unjustified pooled estimate and distinguishes process outcomes from utilization. Limitations are the current single-reviewer evidence map, incomplete database coverage, provisional risk-of-bias judgments, and absence of final PRISMA screening counts. These limitations must be resolved before journal submission.

5. CONCLUSION

Pharmacist-led medication reconciliation reduces medication discrepancies and clinically important medication errors during transitions of care, with the clearest evidence at a defined admission or discharge point. Reconciliation alone has not consistently reduced readmission or emergency utilization. Multicomponent, risk-stratified services that integrate pharmacy technicians, pharmacists, prescribers, patients, and post-discharge communication are the most defensible direction for practice and future Saudi research.

5.1. Practice Recommendations

- •Prioritize high-risk patients using age, polypharmacy, high-risk medicines, ICU/cardiac care, and recent utilization.
- •Complete the best possible medication history and reconciliation as early as possible, preferably within 24 hours of admission.
- •Define technician, intern, resident, and pharmacist responsibilities with escalation criteria.
- •Combine discharge reconciliation with counseling, a patient-friendly medication list, provider communication, and targeted follow-up.
- •Audit clinically important discrepancies resolved, acceptance, timeliness, patient understanding, adverse drug events, and 30-day utilization.

Ethics approval: Not applicable because the review uses published, aggregated evidence and does not recruit participants or use identifiable patient-level data. PRISMA 2020 is a reporting guideline, not an approving ethics body.

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Author contributions: Finalize using CRediT after confirming substantive contributions.

Data availability: The evidence-extraction workbook accompanies this draft; final search exports, screening records, extraction forms, and risk-of-bias assessments should be retained.

REFERENCES

Abdulghani, K. H., et al. (2018). The impact of pharmacist-led medication reconciliation during admission at a tertiary care hospital. International Journal of Clinical Pharmacy. https://doi.org/10.1007/s11096-017-0568-6

Alatmi, S. A., et al. (2025). Medication reconciliation in intensive care units of a tertiary hospital in Saudi Arabia. PMID: 39744801.

Alghamdi, A., et al. (2022). Evaluation of pharmacy intern-led transition of care service at an academic hospital in Saudi Arabia: A prospective pilot study. Saudi Pharmaceutical Journal. https://doi.org/10.1016/j.jsps.2022.05.021

Al-Jazairi, A. S., Al-Suhaibani, L. K., Al-Mehizia, R. A., Al-Khani, S., Lewis, G., De Vol, E. B., & Saad, E. J. (2017). Impact of a medication reconciliation program on cardiac surgery patients. Asian Cardiovascular & Thoracic Annals, 25(9), 579–585. https://doi.org/10.1177/0218492317738382

Cheema, E., et al. (2018). The impact of pharmacists-led medicines reconciliation on healthcare outcomes in secondary care: A systematic review and meta-analysis. International Journal of Clinical Pharmacy. https://doi.org/10.1007/s11096-018-0620-5

Jošt, M., Kerec Kos, M., Kos, M., & Knez, L. (2024). Effectiveness of pharmacist-led medication reconciliation on medication errors at hospital discharge and healthcare utilization in the next 30 days: A pragmatic clinical trial. Frontiers in Pharmacology, 15, 1377781. https://doi.org/10.3389/fphar.2024.1377781

Mazhar, F., et al. (2018). Prevention of medication errors at hospital admission: A single-centre experience in elderly admitted to internal medicine. International Journal of Clinical Pharmacy. https://doi.org/10.1007/s11096-018-0737-2

Mekonnen, A. B., McLachlan, A. J., & Brien, J.-A. E. (2016). Pharmacy-led medication reconciliation programmes at hospital transitions: A systematic review and meta-analysis. Journal of Clinical Pharmacy and Therapeutics, 41(2), 128–144. https://doi.org/10.1111/jcpt.12364

Redmond, P., et al. (2018). Impact of medication reconciliation for improving transitions of care. Cochrane Database of Systematic Reviews, 8, CD010791. https://doi.org/10.1002/14651858.CD010791.pub2