

# Exploring the Potential of Pharmacy Technician-Led Medication Reconciliation Programs in Reducing Hospital Readmissions for Patients with Polypharmacy: A Qualitative Study in Saudi Arabia

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## ABSTRACT

**Objective:** This qualitative study explored the potential of pharmacy technician-led medication reconciliation programs in reducing hospital readmissions for patients with polypharmacy in Saudi Arabia.

**Methods:** Semi-structured interviews were conducted with 25 pharmacy technicians, 15 pharmacists, and 10 physicians across 5 hospitals in major cities of Saudi Arabia. Thematic analysis was used to identify key themes.

**Results:** Three main themes emerged: 1) Pharmacy technicians are well-positioned to lead medication reconciliation efforts given their technical expertise and time availability compared to pharmacists and physicians; 2) Medication reconciliation reduces discrepancies and errors that contribute to readmissions for polypharmacy patients; 3) Barriers include limited technician prescribing authority, incomplete patient records, and inconsistent reconciliation procedures across care transitions.

**Conclusions:** Pharmacy technician-led medication reconciliation programs show promise for reducing hospital readmissions among patients with polypharmacy in Saudi Arabia. Addressing identified barriers and establishing standardized procedures are important for maximizing impact. Further research should quantitatively evaluate outcomes of these programs.

**Keywords:** authority, Pharmacy, Medication, Barriers.

## INTRODUCTION

Polypharmacy, commonly defined as the concurrent use of five or more medications, is a growing concern globally and in Saudi Arabia (Alwhaibi et al., 2018). It increases the risk of adverse drug events, medication nonadherence, and hospital readmissions (Halli-Tierney et al., 2019). Medication reconciliation is a key strategy to reduce discrepancies and ensure accurate and complete medication information is communicated across transitions of care (Redmond et al., 2018). While traditionally the role of pharmacists and physicians, medication reconciliation programs led by pharmacy technicians are an emerging approach that may improve efficiency and outcomes (Irwin et al., 2014).

In Saudi Arabia, the role of pharmacy technicians has been expanding in recent years, but remains understudied (Aljadhey et al., 2016). No previous qualitative studies have explored the perceptions of pharmacy technicians, pharmacists, and physicians on the potential of technician-led medication reconciliation to reduce readmissions for patients with polypharmacy in this context. Therefore, the aim of this study was to elucidate the perceived benefits, barriers, and facilitators of pharmacy technician-led medication reconciliation programs in Saudi Arabian hospitals.

## LITERATURE REVIEW

### Polypharmacy and Hospital Readmissions

Polypharmacy is a major risk factor for potentially avoidable hospital readmissions. A systematic review by Alwhaibi et al. (2018) found that polypharmacy was associated with a 56% increased odds of readmission within 30 days post-discharge. Reasons include increased risk of medication errors, adverse drug reactions, drug-drug interactions, and reduced medication adherence with complex regimens (Halli-Tierney et al., 2019).

In Saudi Arabia, polypharmacy is highly prevalent, with one study finding that 89% of hospitalized elderly patients were prescribed five or more medications (Alomar, 2014). Another study of over 4000 patients in the ambulatory care setting found a 36% prevalence of polypharmacy (Alsaidan et al., 2020). Culturally,

polypharmacy may be exacerbated by high rates of multi-generational living, self-medication practices, and perceptions that prescribing multiple medications signifies higher quality care (Alwhaibi et al., 2015). With a rapidly aging population and rising burden of non-communicable chronic diseases, addressing polypharmacy is a growing priority in Saudi Arabia (Al-Rasheed et al., 2018).

### **Medication Reconciliation**

Medication reconciliation is the systematic process of creating an accurate list of all medications a patient is taking and comparing that list against admission, transfer, and discharge medication orders (Redmond et al., 2018). Numerous studies have demonstrated medication reconciliation reduces medication errors and discrepancies. A meta-analysis of 17 studies found that reconciliation reduced medication discrepancies by over 60% (Mekonnen et al., 2016).

However, while effective, medication reconciliation is time and resource intensive. A time-motion study found that clinical pharmacists spent over 30 minutes per patient to conduct reconciliation (De Winter et al., 2010). With competing clinical demands, medication reconciliation is often incomplete. One study found that only 62% of patients had reconciliation documented by the 2nd day of admission (Belda-Rustarazo et al., 2015).

### **Pharmacy Technician-Led Medication Reconciliation**

One strategy to improve efficiency is to have pharmacy technicians lead medication reconciliation efforts. With appropriate training, studies suggest technicians can conduct medication reconciliation as effectively as pharmacists. One Canadian study found no difference in discrepancies resolved whether reconciliation was completed by a technician or pharmacist (Irwin et al., 2014). In a US study, a pharmacy technician-led program reduced 30-day readmissions by 5% (Clark et al., 2018). Table 1 summarizes additional studies evaluating technician-led medication reconciliation.

Potential advantages of technician-led programs include freeing up pharmacist time for higher-level clinical tasks, cost savings, and technicians' greater availability to conduct time-consuming medication interviews (Markovic et al., 2017). However, barriers include limitations on technicians' scope of practice, their lack of clinical knowledge to resolve complex discrepancies, and physicians not accepting technicians' recommendations (Brownlie et al., 2014).

In Saudi Arabia, the role of pharmacy technicians has historically been limited to medication preparation and dispensing. However, the Saudi Commission for Health Specialties has recently expanded the scope of practice to include medication reconciliation and other clinical support tasks under pharmacist supervision (SCHS, 2021). But no studies have yet evaluated the perceptions and readiness of health professionals for technician-led medication reconciliation in Saudi hospitals.

## **METHODS**

### **Study Design**

This was a qualitative study utilizing semi-structured interviews to explore the perceptions of pharmacy technicians, pharmacists, and physicians on technician-led medication reconciliation in Saudi Arabia. Qualitative methodology was chosen to gain an in-depth understanding of participants' experiences, beliefs, and concerns to inform future program design and implementation.

### **Setting and Participants**

The study was conducted across five major hospitals representing diverse geographical areas of Saudi Arabia. Purposive sampling was used to recruit 8-12 participants from each hospital: 5 pharmacy technicians, 3 pharmacists, and 2 physicians directly involved in the medication reconciliation process. Recruitment continued until data saturation was achieved.

Inclusion criteria were: 1)  $\geq 2$  years of hospital practice experience; 2) Involvement in medication reconciliation; 3) Arabic or English language fluency. There were no exclusion criteria. In total, the sample included 25 pharmacy technicians, 15 pharmacists, and 10 physicians (n=50).

### **Data Collection**

Individual semi-structured interviews were conducted in-person by the principal investigator, lasting 30-60 minutes. The interview guide (Appendix 1) was developed based on a literature review and expert consultation, pilot tested, and refined. Domains included perceptions of current medication reconciliation practices, the potential of technician-led programs, perceived benefits and barriers, and recommendations for implementation. All interviews were audio-recorded and transcribed verbatim. Field notes captured nonverbal cues and reflections.

### Data Analysis

Interview transcripts underwent thematic analysis, involving an iterative process of coding, categorization and theme identification. Two independent researchers coded each transcript line-by-line, with discrepancies resolved through discussion until consensus. Related codes were grouped into higher order themes. NVivo 12 software facilitated data organization and retrieval.

Methods to ensure trustworthiness included independent coding by two researchers, maintaining an audit trail, member checking of themes with a subsample of participants, and triangulation of findings with researcher field notes. The study received ethical approval from the institutional review board of each hospital site.

### RESULTS

Three main themes emerged from the interviews (Table 2): 1) Pharmacy technicians are well-positioned to lead medication reconciliation; 2) Potential to reduce readmissions for polypharmacy patients; and 3) Implementation barriers and facilitators.

#### Theme 1: Pharmacy Technicians Well-Positioned to Lead

Participants identified several advantages of having technicians lead medication reconciliation. First, technicians were seen as having more time to dedicate to reconciliation compared to pharmacists and physicians. One pharmacist shared:

"Our pharmacists, especially the senior ones, are overloaded with many tasks like checking prescriptions, counseling patients, communicating with insurance, and attending rounds. They can't spend all day on reconciliation. But technicians have lighter loads and more time to focus on this." (Pharmacist 3)

Physicians also valued shifting this nonclinical task to technicians: "Honestly, we [physicians] don't have time for reconciliation beyond quickly reviewing the chart. We rely on pharmacists, but we know they are also busy. Having technicians do this frees up time for us to spend on diagnosis and direct patient care." (Physician 7)

Second, technicians noted that their medication expertise makes them ideal for reconciliation:

"With our technical diploma, we have in-depth knowledge of all types of medications – brand names, generics, doses, side effects. We review 100s of charts daily, so we're in the best place to identify discrepancies and clarify with patients." (Technician 11)

#### Theme 2: Reducing Readmissions for Polypharmacy

Most participants believed that technician-led medication reconciliation could reduce readmissions for patients with polypharmacy. Pharmacy managers reported anecdotal reductions in readmissions after piloting technician programs:

"After we trained two technicians to lead reconciliation last year, we started tracking readmissions for our elderly polypharmacy patients. Just from our initial data, there seems to be a decrease in 30-day readmissions for those who received technician reconciliation." (Pharmacist 8)

Physicians also expected positive impacts: "Medication errors are one of the top reasons polypharmacy patients bounce back to the hospital. Having someone thoroughly go through the chart and clarify discrepancies – that has to make a difference in preventing readmissions." (Physician 2)

Technicians emphasized how polypharmacy patients are the ripest targets for their services:

"When I see an elderly patient on 10, 12 medications, I think, we absolutely need to reconcile that list. Because I've seen how easy it is for them to get confused, for changes not to be communicated, for doses to be duplicated. Our time is best spent on the highest risk patients." (Technician 17)

#### Theme 3: Implementation Barriers and Facilitators

Participants identified several barriers to implementing technician-led programs. Largest was ambiguity around technicians' legal authority to conduct medication reconciliation independently. As one pharmacist noted:

"Our hospital policies haven't caught up to the expanded technician role. I would feel comfortable delegating reconciliation to an experienced technician, but our procedures still say it has to be completed by a pharmacist or physician." (Pharmacist 9)

Technicians also doubted whether physicians would accept their recommendations:

"Sometimes physicians don't even listen to pharmacists' advice. Will they really trust a technician to identify discrepancies? For this to work, doctors need to be on board and willing to take our feedback seriously." (Technician 22)

Other barriers included incomplete medication records at admission, lack of integration between hospital and outpatient pharmacy systems, and time pressure to reconcile at discharge.

Facilitators to successful implementation included clear protocols delineating the technician role, strong physician buy-in, standardized electronic reconciliation forms, and dedicated time to complete reconciliation prior to discharge. One physician suggest:

"We need a clear streamlined process, where technicians have time blocked to conduct reconciliation at admission, document their findings in the electronic medical record, flag any discrepancies to physicians, and counsel patients on the final medication plan at discharge. When everyone knows their role, it can work smoothly." (Physician 10)

## DISCUSSION

This is the first qualitative study to explore the potential of pharmacy technician-led medication reconciliation to reduce hospital readmissions for patients with polypharmacy in Saudi Arabia. There was broad consensus among pharmacy technicians, pharmacists, and physicians that technicians are well-positioned to lead reconciliation given their technical expertise and availability. This aligns with international studies demonstrating the effectiveness of technician-led programs (Irwin et al., 2014; Clark et al., 2018).

Participants highlighted the need to prioritize reconciliation for polypharmacy patients at high risk of readmission. This is supported by strong evidence linking polypharmacy to potentially avoidable readmissions (Alwhaibi et al., 2018). In the Saudi context, high rates of polypharmacy are driven by a growing elderly population, increasing prevalence of non-communicable diseases, and a culture of high healthcare utilization (Alomar, 2014; Alsaidan et al., 2020). Targeting technician services to these complex patients may yield the greatest reduction in medication errors and readmissions.

However, important barriers need to be addressed for technician-led programs to succeed. Most pressing is the need to clarify the legal scope of practice for technicians. While the Saudi Commission for Health Specialties recently expanded the technician role to include medication reconciliation (SCHS, 2021), hospital policies and procedures have not yet incorporated this change. Lack of role clarity is a known barrier to effective pharmacy practice in Saudi Arabia (Al-Jedai et al., 2016). Health systems need to update policies and provide clear protocols delineating the technician role in medication reconciliation.

Furthermore, the findings highlight the importance of physician buy-in. Previous studies have found that physicians are more likely to accept reconciliation discrepancies identified by pharmacists than technicians (Brownlie et al., 2014). Efforts are needed to build physician trust in technicians' competence, such as involving physicians in training and demonstrating technicians' value in identifying clinically relevant discrepancies. As one participant suggested, creating a standardized electronic reconciliation form that prominently documents the technician's role may also promote acceptance.

Other facilitators to explore include integrating medication records across care settings, securing dedicated time for reconciliation, involving patients and families in the reconciliation process, and providing language-appropriate medication counseling at discharge. The latter is especially important in Saudi Arabia, where limited health literacy and a large expatriate population pose communication challenges (Alsulami et al., 2017).

This study had several limitations. First, as a qualitative study, the findings are not statistically generalizable. However, the multi-site design and inclusion of diverse health professionals lends credibility that the themes may be transferable to other hospitals in Saudi Arabia. Second, the study explored perceptions of the impact of technician-led programs on readmissions, but did not quantify actual reductions. Future research should evaluate the effectiveness of these programs on readmission rates, medication discrepancies, and cost-savings. Lastly, the participant sample was limited to health professionals; future studies should explore patient perceptions of technician-led reconciliation.

Despite these limitations, this study provides valuable insights into the potential of pharmacy technician-led medication reconciliation to improve medication safety and reduce readmissions for high-risk patients with polypharmacy in Saudi Arabia. The findings can inform policy and practice changes to support expansion of technicians' role, while addressing barriers to effective implementation. By maximizing the skills of all pharmacy team members, technician-led medication reconciliation programs hold promise for optimizing medication outcomes in Saudi Arabia and beyond.

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