Lost in Transition: Pharmacist Roles in Identifying and Evaluating Medication-Related Problems During Hospital Discharge Follow-up Visits in a Primary Care Setting

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Abstract

Objectives: The objective of this study was to identify and evaluate medication-related problems (MRPs) found during hospital discharge transitions of care visits in a primary care setting. **Design, Settings, and Participants:** This retrospective cohort took place within a federally qualified health center (FQHC) where pharmacists are part of the interprofessional transitions of care team to help patients transition back to primary care after being discharged from the hospital. Pharmacists utilized standardized forms to document MRPs, potential and adverse drug events, and interventions made during the visit. This study quantifies the role that pharmacists can have by conducting medication reconciliation during postdischarge primary care visits. Patients included in this study were 18 years and older with at least 5 medications. **Outcome Measures:** The outcomes of this study include the number and type(s) of MRPs, number and severity of potential adverse drug events (pADEs) and adverse drug events (ADEs) that were identified, as well as the number and type of recommendations or interventions made by the pharmacist. The MRP types and pADE/ADE severity were classified and stratified using predetermined definitions. **Results:** During the 4-month study period from October 1, 2018 to February 4, 2019, 134 visits were completed. Outcomes included a total of 454 MRPs, with an average of 3 identified per visit. The most common MRPs were medication list in electronic health record inaccurate (79.1% of visits), poor adherence (32.1% of visits), and refills needed (30.6% of visits). A total of 72 pADEs and 27 ADEs were identified, with 524 recommendations made. **Conclusion:** Pharmacists serve a unique role during transitions of care by identifying MRPs. Pharmacists are an integral part of a patient's health care team by making recommendations or interventions related to these MRPs. FQHCs and other primary care settings should consider integrating pharmacists into a collaborative transitions of care team.

Keywords

pharmacy, community health, primary care, medications, quality improvement, underserved communities

Background

A transition of care is defined by the Centers for Medicare & Medicaid Services (CMS) as "the movement of patients from one setting of care to another."[1] It is well known that these transitions are often complicated by miscommunication and medication related problems that can lead to adverse events and patient harm.[2] Nearly 20% of patients experience an adverse event within 3 weeks of a hospital discharge, of which 75% could have been prevented.[3] Of these events, adverse drug events (ADEs) were the most common postdischarge complication (12.5%) of which 62% were ameliorable or preventable.[3] Pharmacists have the opportunity to intervene and increase the quality of care provided to these vulnerable patients.

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Evidence exists demonstrating the benefit of pharmacists performing medication reconciliation during hospital admission, discharge, and follow-up telephone or home visits within 30 days of discharge.[4-8] Primary care offices may face barriers in effectively transitioning patients back into their care. Some of these barriers may include limited resources such as time and support staff. Challenges to care coordination described in the literature include, but are not limited to lack of reimbursement or financial incentives, lack of communication between electronic health records (EHRs), inadequate workforce, lack of time and competing priorities, and lack of information on hospital experience and treatment.[9] Pharmacists are trained in identifying and intervening in medication-related problems (MRPs) due to transitions of care, which may reduce potential adverse drug events, costly hospital readmissions, or emergency department visits. Currently the few published studies supporting the implementation of pharmacist-led transitions of care visits in a primary care setting tend to be small in nature or focus on a specific population (heart failure, elderly patients, etc). [4-8] This study seeks to add to the existing literature by investigating a more generalizable and expanded population.

Objectives/Purpose

The purpose of this study was to quantify and evaluate pharmacist-identified MRPs during transition of care visits in a primary care setting. The outcomes of this study include the type and quantity of these MRPs, pharmacist interventions, potential adverse drug events (pADEs), and ADEs identified.

Methods

Study Design, Setting, and Population

This retrospective cohort study took place at a federally qualified health center (FQHC) located in Massachusetts over a period of 4 months (October 1, 2018 to February 4, 2019). This study was approved by the institutional review board. The FQHC utilizes a patient-centered medical home model of care using an integrated team of health care providers to provide high quality care regardless of patients' ability to pay for services. Deidentified patient data were included in the analysis if the patient had completed a hospital discharge follow-up visit with a FQHC provider and a pharmacist. Patients who were younger than 18 years or who had less than 5 medications were excluded from this study.

The FQHC has a standardized procedure for all patients transitioning into care. After patients are discharged from the hospital, nurses collect and scan hospital discharge documentation into the EHR. The patient is scheduled for an interprofessional hospital discharge follow-up appointment with their primary care provider (or another available FQHC provider) and a clinical pharmacist. These appointments are intended to be within 72 hours of discharge, but due to scheduling challenges and a high no-show rate it is often that patients are not seen for several days to weeks after being discharged. Prior to the appointment, pharmacists review the hospital documents and acquire medication refill history from the patient's preferred pharmacy. During the appointment, the pharmacist assesses the patient's awareness of medication changes, adherence, and performs a comprehensive medication reconciliation. The pharmacist then completes a warm hand-off to the provider, giving a comprehensive synopsis about the patient's hospitalization. The provider and pharmacist are responsible for joint documentation of the visit within the EHR. Pharmacists update the patient's medication list within the EHR, document medication reconciliation, and queue any refills or prescriptions to the provider. Finally, the pharmacist collaborates with the patient's preferred pharmacy regarding any medication changes or discontinuations.

The pharmacist documents any identified MRPs (including pADEs and ADEs) on a standardized form. This form was adapted from the University of Southern California School of Pharmacy Medication Therapy Intervention and Safety Documentation Program.[10] The corresponding interventions and recommendations made by the pharmacist and the numbers of added, changed, or discontinued medications are also documented. MRPs that are determined to be significant safety concerns are categorized as pADEs or ADEs (Table 1). ADEs are defined as MRPs that lead to actual harm. pADEs are defined as MRPs that have the potential to cause significant harm to the patient but have not yet caused harm. Identified pADEs and ADEs are stratified by severity. All documented MRPs must have occurred during the time period between discharge and the follow-up visit with primary care, or are current, active problems affecting the patient's care.

Data Analysis

All data were analyzed retrospectively. The outcomes including the amount and type of MRPs, the amount and severity of pADEs, ADEs, and the amount and type of pharmacist recommendations were all collected using the standardized form and analyzed using descriptive statistics.

Results

Over 4 months, 134 hospital discharge follow-up visits were conducted for 128 patients. A total of 454 MRPs were identified with an average of 3.39 MRPs per visit. MRPs that occurred in >5 visits are reported in Table 1. The same MRP may have been identified multiple times for the same visit. For example, if the patient experienced an ADE to 2 different medications, this MRP would have been documented twice.

Table I. Medication-Related Problems (MRPs).

MRP	Number of Occurrences	Number of Visits that MRP Was Identified in (%)
Appropriateness and effectiveness		
Untreated medical problem	18	17 (12.7)
Treatment not optimal based on current evidence/guidelines	14	14 (10.4)
Drug dosing not adequate for treatment goals (dose, interval, or duration)	8	7 (5.2)
Safety (pADE and ADE)		
Adverse drug event occurred	23	22 (16.4)
Dose discrepancy between patient use and prescribed therapy	18	17 (11.2)
Therapeutic duplication	12	12 (9.0)
Medication overuse/misuse	12	12 (9.0)
Drug dosing excessive for treatment goals	6	6 (4.5)
Drug interaction	6	6 (4.5)
Nonadherence and patient variables		
Medication underuse/poor adherence	48	43 (32.1)
Inadequate patient self-management of lifestyle or other nondrug variables	12	12 (9.0)
Patient dissatisfied or refuses treatment	11	10 (7.5)
Miscellaneous		
FQHC provider medication list inaccurate	106	106 (79.1)
Needs refills	41	24 (30.6)
Transitions of care		
Patient prescribed medication at discharge, has not been taking at home	22	19 (14.9)
Home medication omitted from hospital discharge medication list	20	20 (14.9)
Dose discrepancy between home and hospital medication list	19	19 (14.2)
Extra medication on hospital medication list, patient not taking at home	18	18 (13.4)
Medication discontinued after discharge, patient continued taking at home	7	7 (5.2)
Medication held during hospitalization, never restarted on discharge	7	4 (3.0)

Abbreviations: ADE, adverse drug event; pADE, potential adverse drug event; FQHC, federally qualified health center.

The most frequently reported MRP was "med list in the EHR inaccurate" with 108 occurrences (79.1% of visits). The medication list is inaccurate if any medications are added, discontinued, or changed on hospital discharge. Poor adherence occurred in 32.1% of visits and was identified using refill histories and patient report. Identification of poor adherence allows for pharmacist education, counseling, and motivational interviewing. Pharmacists are also able to refer patients to the medication therapy management clinic to further assess and improve adherence. When patients are discharged from the hospital, they are often given prescriptions with no remaining refills, leading to incomplete continuation of essential therapy. Pharmacists were able to recognize the need for medication refills postdischarge and request from the appropriate providers. Prescriptions requiring refills occurred 41 times (30.6% of visits).

Other outcomes included the number of pharmacist interventions/recommendations (Table 2), and potential or actual ADEs identified (Table 3). A total of 524 pharmacist interventions/recommendations were made, with an average of 3 per visit (Table 2). The most common intervention was "updating the EHR medication list" (85.1% of all visits). Other common interventions included providing patient education (52.2% of visits), requesting refills (33.6% of visits), and clarifying medication orders with prescribers (31.3% of visits). Patient education occurred when nonadherence was identified as well as many other opportunities, including new medication counseling, product demonstration with insulin pens and inhalers, as well as disease state management. Several types of MRPs have the potential to lead to ADEs. For example, if a patient misused or overused their medication inappropriately, an ADE could occur. A total of 72 pADEs were identified and 27 actual ADEs were identified (Table 3). Each pADE and ADE were further stratified into severity.

Discussion

Pharmacists have an important role within a FQHC where high-risk patients and health literacy concerns are common. The most frequent intervention of updating the medication list is essential for primary care providers to assess and treat patients safely and optimally. Identifying nonadherence and then educating patients about strategies to improve adherence is also a unique role that pharmacists were able to serve. Historically, patients may be reluctant to admit nonadherence to their primary care provider, whereas pharmacists in this study were able to identify this in 32.1% of all visits.[11,12] Another role that the pharmacist served frequently is

Table 2. Pharmacist Recommendation/Intervention.

Pharmacist Recommendation or Intervention	Number of Occurrences	Number of Visits that Recommendation/ Intervention Was Made in (%)
Update FQHC provider medication list[a]	131	114 (85.1)
Educate patient[a]	110	70 (52.2)
Clarify prescription with prescriber[a]	54	42 (31.3)
Request refills[a]	47	45 (33.6)
Discontinue medication[b]	39	34 (25.4)
Refer to other service[b]	32	29 (21.6)
Initiate new medication[b]	28	27 (20.1)
Change medication dose/dose interval[b]	25	23 (17.2)
Other	19	14 (10.4)
Substitute medication(s)[b]	13	12 (9.0)
Order monitoring (labs/diagnostic testing)[b]	11	11 (8.2)
Provide medication adherence packaging[a]	7	7 (5.2)
Make appointment with another provider[b]	6	6 (4.5)
Change duration of treatment/quantity[b]	1	1 (0.7)
Substitute dosage form[b]	1	1 (0.7)

Abbreviation: FQHC, federally qualified health center.
[a]Indicates an intervention made directly by pharmacist.
[b]Indicates recommendation made by pharmacist to provider.

Table 3. Potential and Adverse Drug Events.

	Number of Occurrences
Potential adverse drug event (pADE)	
Potential for ADE resulting in temporary harm and requiring intervention by patient or health care professional	61
Potential for ADE resulting in temporary harm and requiring ER visit or hospitalization	8
Potential for ADE resulting in permanent harm/disability	3
Adverse drug event (ADE)	
Event occurred, resulting in temporary harm and requiring intervention by patient or healthcare professional	21
Event occurred, resulting in temporary harm and requiring ER visit or hospitalization	6

Abbreviation: ER, emergency room.

identifying and assisting patients in obtaining necessary refills of medications. The pharmacist was able to reliably identify any medications that required additional refills and collaborate with the primary care physicians to ensure continuity of care. By having the pharmacist serve this role, it removes the burden of refill requests from several other members of the team. For example, the patient may have otherwise relied on their community pharmacy to obtain a refill. Often community pharmacies will experience delays when attempting to obtain refills from the hospitalist or an alternate provider. This service also removes the burden from the patient who may have a difficult time navigating the health care system especially during a transition of care. Finally, it assists providers as it removes this task from their already encumbered workload. Another unique MRP pharmacists were able to identify is "patient dissatisfied or refuses treatment." This MRP gets at the heart of patient-centered care and is another example of

when patients may be reluctant to open up about their dissatisfaction to their provider. Patients may be more willing to express these concerns to another member of the care team, like a pharmacist, who can serve as a patient advocate and create recommendations that the patient may be more willing to adhere to. This study was conducted in a unique FQHC setting where pharmacists are utilized in progressive and innovative ways and are embedded within the health care team. Anecdotally, having a dedicated pharmacist available to intervene with all visits throughout the day has improved provider satisfaction of pharmacist services across the health center. The pharmacists share a strong relationship with providers within the FQHC due to these daily collaborative interactions. FQHCs and other primary care settings should consider utilizing pharmacists in this expanded role to conduct joint visits with primary care providers, identify MRPs, and optimize a patient's transition of care experience.

In comparison with previously published studies, a strength of this study is that it included a large sample size and diverse patient population with multiple chronic disease states, allowing for extrapolation to the general public. Additionally, all pharmacists participating in the transitions of care visits had standardized training, allowing for reduced variability in completing data collection forms. There are several limitations to this study including the retrospective and descriptive style. Lack of a comparator does not allow for proven superiority of including pharmacists in transitions of care teams. Another limitation is that the accepted rate of recommendations or resolution rate of MRPs was not documented or able to be quantified. Based on the trial design, it cannot be determined if the MRPs identified by pharmacists were solved, able to be solved, or would have been solved by a different mechanism if a pharmacist had not intervened. Additionally, the number of MRPs related to "EHR inaccuracies" is elevated, as any changes made to a patient's medication therapy on discharge would result in this MRP. Although the number is high, it serves as a mechanism to document the role of a pharmacist in identifying and correcting this system-wide error, as the hospital systems are unable to update the medication lists of the FQHC. Another limitation includes the potential for interrater variability of selecting MRPs and identifying pADE severity. Despite standardized training, this is still subjective and difficult to maintain homogeneity between pharmacist's selections. Finally, this study does not contain any patient-oriented outcomes so the clinical effects of a pharmacist identifying and intervening on these MRPs cannot be directly stated.

Conclusion

This study has demonstrated that pharmacists are valuable assets on a collaborative transition of care team by identifying and intervening on MRPs and pADEs. Pharmacists assisted providers most often by updating medication lists, identifying/ intervening with nonadherence, and requesting refills. This study identified that patients often confided in the pharmacist about dissatisfaction, nonadherence, or other concerns allowing the care team to optimize patient centered care. Pharmacists are well suited to assist primary care providers in transitions of care and should be used as a resource in a FQHC setting. Future studies involving pharmacist-led medication reconciliation during transitions of care across multiple primary care settings, including a comparator group with usual care, would be beneficial. Additionally, studies investigating outcomes that include patient outcomes, hospitalization readmission rates, or cost-effectiveness, would allow for stronger conclusions of utilizing pharmacists in this manner.

Authors' Note

Previous presentation: Poster at the APhA 2019 Annual Meeting, Seattle, WA.

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