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PHARMACISTS' AND PATIENTS' PERCEPTIONS OF ROLE OF PHARMACIST IN DISCHARGE PROCESS

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PHARMACISTS' AND PATIENTS' PERCEPTIONS OF ROLE OF PHARMACIST IN
DISCHARGE PROCESS

A Thesis
Presented to
the Graduate School of
Clemson University

In Partial Fulfillment
of the Requirements for the Degree
Master of Science
Industrial Engineering

by
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ABSTRACT

The objective of this study was to identify the perceptions of both patients and pharmacists about the pharmacist's role in the hospital discharge process. In order to do this, observations were conducted with the patients and interviews were conducted with both patients and pharmacists. During the interviews, both the patients and pharmacists were asked about the pharmacist's role in the hospital discharge process. The interviews were qualitatively analyzed using the in vivo technique. Four high-level themes emerged from this study: Current role of a pharmacist in the hospital, Ideal role of a pharmacist in the discharge process, Pharmacists' perceptions of patients, and Patients' perceptions of pharmacist's role. Each of these themes was further divided into sub-categories using a human factors perspective. From the results, it was observed that patients are not aware of the current role of a pharmacist in the hospital and that there is no interaction between patients and pharmacists during the discharge process. Pharmacists suggested changes to their current role to improve communication with the patients.

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CHAPTER ONE

INTRODUCTION

A medication error is defined as a preventable mistake in prescribing, delivering or administering medication to a patient (1). The occurrence of a medication error can lead to DRPs¹ (Drug Related Problem). DRPs are vital patient safety issues (2-4) which lead to increased readmission rates (2). A DRP is an event or circumstance involving drug therapy that actually or potentially interferes with desired health outcomes (5). Types of DRPs include drug choice problems, dosing problems, drug use problems, drug interactions, and adverse drug events (5). Adverse drug events, defined as any injury due to medication (6), are of particular concern since 20% of patients discharged from the hospital experience ADEs (7) and 29% of those ADEs are life threatening (7). The distal causes of ADEs are factors such as multiple changes to patients' medication regimen (9), poor patient education (10, 11), no follow-up care or interruption of care (12). These factors lead to the proximal causes of ADEs which are inappropriate medication prescription, discrepancies between prescribed and actual medication regimen, reduced medication adherence, and insufficient observation for adverse effects (13-15). However, many of the ADEs patients experience are actually preventable (16). In fact, research shows that anywhere between 28-95% of ADEs can be prevented during the discharge process (6, 17-20).

¹ DRPs(Drug Related Problems): Circumstances that involve pharmaceutical treatment and interfere with best possible outcomes and result in worsening medical condition of patients, including overdosage, subtherapeutic dosage, adverse drug reactions, and failure to receive drugs (noncompliance) for a variety of reasons (1)

Clinical pharmacists have the expertise to help prevent DRPs in general (21), and ADEs specifically (21) during and after hospitalization. They are well-suited to counsel patients at discharge and identify and resolve medication-related problems that occur as patients' transition between different health care settings and home (21-23). Using pharmacists to facilitate the patient discharge process by identifying and reconciling medication discrepancies can reduce adverse outcomes (23, 24). Studies examining the impact of pharmacist interventions during discharge process report reduced preventable ADEs after discharge, hospital readmission and return visits to emergency department (ED) (21, 25-27).

Discharge process

To achieve a high quality discharge process, preparation for discharge should start when the patient is admitted to the hospital (28), and the process should include physical, psychological and social aspects of individual patient care (29). Physical aspects consider the medical condition of the patient and include consciousness, pain, wound management, and mobility. Psychological aspects include information about patient recovery at home in relation to their illness or the procedure they have undergone. The psychological component considers the needs of informal care givers, information about follow-up appointments, and appropriate transfer of care arrangements. Social criteria comprise of suitable home transportation for the patient, and arrangement of suitable assessments in the home (29).

The aims of the discharge process are: to reduce the length of stay, avoid unplanned readmissions, and improve the coordination of services after discharge (30). It can be divided into the following steps (29):

- I. Discharge planning: Discharge planning is the development of an individualized discharge plan for the patient prior to leaving the hospital. It ensures that patients are discharged at an appropriate time and with provision of adequate post-discharge services (30). This process ideally begins at the start of hospitalization. The hospital case manager is involved as soon as it is clear that the patient will require services at home, or will require transfer to an alternative level of care (29).
- II. Medication reconciliation: Medication reconciliation, or medication review, is the process of verifying patient medication lists at a point-of-care transition, such as during the hospital discharge process, to identify which medications have been added, discontinued, or changed relative to pre-admission medication lists. This process is carried out at the start of hospitalization and point of care transition (29).
- III. Discharge summary: The primary mode of communication between the hospital care team and aftercare providers (primary care centre of the patient) is often the discharge summary. The hospital care team transfers this document to the primary care physician of the patient towards the end of the discharge process and before the patient leaves the hospital for home (31).

- IV. Patient instructions: At the time of discharge, the patient is provided with oral instructions and a document that includes language and literacy-appropriate instructions and patient education materials to help in successful transition from the hospital (29).
- V. Discharge checklist: The discharge checklist is provided to the patients at the end of patient instructions and can help patients and caregivers track all the information they should understand before leaving the hospital (32).

Involving a pharmacist in different stages of the discharge process has proven to be beneficial for the patients. Data suggest that pharmacists' participation in the discharge process reduces medication errors (37, 49-51). Pharmacists can participate in the discharge process by performing activities like discharge rounding (33, 34, 36, 40, 41), medication reconciliation (35, 37, 46, 47), and pharmacotherapeutic counselling (38, 43). However, despite the benefits, the inclusion of pharmacists in the hospital discharge process is still far from the norm.

The table below summarizes several studies and provides a list of interventions performed by pharmacist and their outcomes and findings.

Table 1.1: Summary of studies with pharmacist interventions in discharge process

Paper, year	Setting	Intervention	Outcome measures	Findings
Leape et al, 1999 (33)	A medical ICU unit in a large urban teaching hospital	Senior pharmacist made rounds with ICU team and was available for	Preventable adverse drug events	Senior pharmacist decreased 66% of the adverse drug events observed

		consultation in ICU		(10.4 to 3.5 per 1000 patient days)
Scarsi et al, 2002 (34)	A 600 bed academic medical centre	Clinical pharmacist actively participated in daily rounds.	Medication errors (intervention/control group)	Medication errors were reduced by 51%. The number of patients without a medical error during their hospitalization increased
Stowasser et al, 2002 (35)	8 acute wards and an orthopaedic pre-admission clinic at 2 major hospitals	One pharmacist acquired information about patient medication at the start of their hospitalization	Changes to medication regimen	24% more subjects had at least one change to their medication regimen
Kucukarslan et al, 2003 (36)	An 802 bed tertiary care hospital	Two clinical pharmacists included in rounding team, they documented pharmacotherapy history and provided discharge counselling	Adverse drug events	There was a 78% decrease in the adverse drug events observed (26.5 to 5.7 per 1000 patient days)
Schnipper et al, 2006 (37)	A large teaching hospital	Pharmacists compared discharge regimen with pre-admission	Preventable adverse drug events, satisfaction with	Preventable adverse drug events reduced by 10% in the

		regimen. Pharmacists reviewed indications, directions of use and potential adverse effects of each discharge medication	hospitalization and discharge process	intervention group
Kaushal et al, 2008 (38)	Pediatric ICU and general ward. (2 medical units, 2 surgical units and pediatric ICU and cardiac ICU)	Full-time clinical pharmacist included on ICU team and part time pharmacist included on surgical/medical units. Pharmacists provided information on ADEs, drug interactions and appropriate dosages to physicians	Medication error rates were observed	Full-time clinical pharmacist decreased medication errors (29 to 6 per 1000 patient days); part-time pharmacists did not decrease error rate
Wang et al, 2007 (39)	Pediatrics unit of a community teaching hospital	Integration of CPOE to existing clinical pharmacist system	Medication errors, near misses, and adverse events over a 3-month	Clinical pharmacist intercepted 86 of 111 potentially serious

			period	prescribing errors but none of 32 harmful administrative errors and few of the transcribing (6/25) or monitoring errors (3/7)
Rivkin et al, 2011 (40)	A 1076 bed tertiary care teaching hospital	Clinical pharmacist included in rounding team. The pharmacist reviewed patient's medication profile upon admission	Clinically important drug-drug interactions before and after a clinical pharmacist is present in the rounding	The presence of a clinical pharmacist in the rounding decreased the drug interaction rates by 65% when compared retrospectively (historically) to a 10-week period earlier in the year
LaPointe, 2003 (41)	Cardiology ward in a large hospital	Pharmacist participated in rounding, prepared paper work, collected medication histories and communicated	Medication errors (i.e., wrong dose or wrong drug, missing medications, allergy-drug contraindications)	Inclusion of a pharmacist decreased the errors by 59.5% over the period of four years

		with nurses and physicians regarding issues and provided discharge counselling for patients)	
Stoner et al, 2000 (42)	Outpatient psychiatric setting	Pharmacists recommended dosage to patients with movement disorders	Movement disorder symptoms	82% of the recommendations by the pharmacists were followed. Clinical outcome was positive in 93% of the evaluations that followed recommendation
Simpson, 2004 (43)	Neonatal ICU (NICU)	A pharmacist led education program was instituted which involved the review of medication orders and parenteral fluid prescriptions by a pharmacist after 4 months in a 12 month period	Medication errors	After the intervention, monthly errors fell from 24.1 to 5.1 per 1000 neonatal activity days
Bond et	584 hospitals	Pharmacy staffing	Adverse drug	Pharmacist

al, 2006 (44)	encompassing >35,000 Medicare patient stays	and presence or absence of various pharmacy services	reactions (ADRs)	involvement in 8 services (in- service education, drug information services, adverse drug reaction management, drug protocol management, cardiopulmonary resuscitation teams, medical rounds and completing admission drug histories) as well as higher staffing rates decreased ADRs; however, pharmacist participation in total parenteral nutrition teams increased ADRs
Bond, 2007 (45)	885 U.S. hospitals with data on 2.8 million Medicare	14 different clinical pharmacy services and several staffing models	Severity- adjusted mortality rates	Pharmacist participation in in-service education, drug information,

	patients			adverse drug reaction monitoring, drug protocol management, cardiopulmonary resuscitation teams, medical rounds, and completing admission drug histories were associated with reduced mortality
Brown, 2008 (46)	Emergency department in a large rural hospital	An independent evaluator reviewed the medical records, progress notes, drug orders and laboratory results while the pharmacists checked for their validity	Medication errors pre pharmacist intervention/post pharmacist intervention	The presence of a pharmacist lead to a 66% decrease in medication errors (16.09 when pharmacists were not present and 5.38 when pharmacists were present per 100 medication orders)
Rothschild, 2010 (47)	Four academic Emergency Departments	Emergency Department (ED) pharmacists	Medication errors (1)before reaching the	504 medication errors were identified by the

		reviewed the medications administered to patients.	patient (2) after reaching the patient but no harm done (3) after reaching the patient but some harm done	pharmacists. Over 90% of the medication errors are identified before the errors reached the patient
Cesarz, 2012 (48)	32 bed Emergency department of an academic medical center	Four pharmacists reviewed discharge prescriptions and recommended changes regarding medication to physicians	Prevention of prescription errors	674 discharge prescriptions were reviewed by the pharmacists and a 10.1% intervention rate was recorded

There have been many studies, some described in Table 1.1 that have explored the benefits of including a pharmacist in the discharge process (e.g., 33-51). However, no studies have examined the inclusion of pharmacist in the discharge process from the patient's perspective. Discharge from the hospital to another health care facility or home requires the successful transfer of information between clinicians and to the patient and family to reduce adverse events and prevent readmissions (16). For any communication event to be successful, the sender and receiver should have a positive attitude towards themselves, towards the content of the conversation and towards the other participant (52). Therefore, the purpose of this study was to identify the perceptions of both the

patients and pharmacists regarding the pharmacist's role in the hospital discharge process.

Research questions

1. What are the perceptions of pharmacists on their current role in the discharge process?
2. What are the perceptions of pharmacists on their ideal role in the discharge process?
3. What are the perceptions of patients on the role of pharmacist in the discharge process?

CHAPTER TWO

METHODS

Participants and setting

This study was conducted in a community hospital. It is a 109-bed general acute care facility. The hospital provides services such as surgery, lithotripsy, MRI, CT scan, and emergency and outpatient care, as well as cardiopulmonary services. It includes a 40,000-square-foot outpatient services facility and a 4,000-square-foot diagnostic cardiac catheterization laboratory. The pharmacy serves both inpatients and outpatients. There are currently 7 pharmacists and 4 pharmacy technicians working at the pharmacy. The pharmacy is open for 24 hours a day, 7 days a week.

Patient participants were purposefully sampled from high-risk readmission rate patient population and low-risk readmission rate patient population. High risk readmission rate patient population group includes patients with chronic illnesses while low risk readmission rate patient population group includes patients with acute or non-chronic illnesses. The sample size was 8 participants from each patient population group. The sample size of all patient participants is 16. Among the patients, 7 were male and 9 were female and they were between the ages 38 and 72 years. Table 2.1 provides the education levels of patients.

Pharmacist participants were conveniently sampled from the in-hospital pharmacy. The sample size for pharmacists was 5 participants. Among the pharmacists,

three were male and two were female. They were between the ages 40 to 60 years. Table 2.2 provides details of the pharmacists' experience levels.

Table 2.1: Education levels of patients

Less than high school education	2
High school education	9
College education	1
Nursing school	3
Tech school	1

Table 2.2: Demographic characteristics of pharmacists

Number of pharmacists	5
Experience as a pharmacist (years)	
5-10 years	0
10-15 years	0
>15 years	5
Current position held (years)	
5-10 years	1
10-15 years	3
>15 years	1

Data Collection

Prior to data collection, approval from the Institutional Review Board of the hospital and Clemson University was obtained. This study is a qualitative descriptive study (54, 55).

- I. *Data collection for patients:* Before conducting the interviews, two researchers observed the discharge process where the patient receives discharge instructions from the health care professional, almost always a nurse. The data from the observations was hand recorded by the researcher. Observations are useful as they allow researchers to understand, in real time, the physical actions (e.g.,

communication) of participants and the environment around them (56). These observations helped the researcher to qualify the information given by the patients during the interviews.

Immediately after the observations, before the patient left the hospital, semi-structured interviews were conducted with the patients. During the sixteen interviews, participants were asked about their perceptions of the current/potential role of a pharmacist in the discharge process. Interviews were audio recorded after obtaining verbal consent from the participant. The data was sent to a transcriptionist for transcription of data. The mean duration of patient interviews was 4.5 minutes. See appendix A for the patient interview protocol.

II. *Data collection for pharmacists:* Five semi-structured interviews were conducted with the clinical pharmacists, in the hospital pharmacy. During the interview, participants were asked about their current role in the hospital, their current role in the discharge process and their ideal role in the discharge process. Interviews were audio recorded after obtaining verbal consent from the participant. The data was sent to a transcriptionist for transcription of data. The mean duration of pharmacist interviews was 23 minutes. See appendix B for the pharmacist interview protocol.

Data Analysis

Once the interviews were transcribed, any identifiers of the participants were removed. The transcripts were read and qualitatively coded by the researcher using an in

vivo coding technique (75). In vivo coding is the practice of assigning a label to a section of data, such as a sentence or two within the interview transcript, using a word or a short phrase taken from that section of the data. The aim of creating an in vivo code is to ensure that concepts stay as close as possible to research participants' own words. By using the participants' own terms researchers can capture a key element of what is being described (75). The codes, once created, were then reviewed by another researcher (AJR-R) to address consistency, gaps, or misinterpretations. The researchers then met to discuss the codes and changes were made accordingly. This process was repeated (N=6) until both researchers agreed on the codes. The codes were then grouped to visualize the major themes.

Several measures were implemented to ensure the accuracy of our findings, such as triangulation of methods (57), one-on-one interviews with pharmacists (58), interviewing the participants with the same protocol (57), and an external expert reviewer who was not directly involved in the data collection process reviewed the data analysis multiple times (72, 73).

CHAPTER THREE

RESULTS

The qualitative analysis of interviews revealed themes that align with the research questions: 1. What are the perceptions of pharmacists on their current role in the discharge process; 2. What are the perceptions of pharmacists on their ideal role in the discharge process; and 3. What are the perceptions of patients on the role of pharmacist in the discharge process. Prior to discussing the main results (i.e., answers to RQ 1-3), it is necessary to discuss the current role of the pharmacists in the hospital so as to put their current role in the discharge process in context.

Current role of the pharmacist in the hospital

During the interviews, pharmacists discussed their current role in the hospital. Below is a table containing the list of codes for the current role of the pharmacist in the hospital.

Table 3.1: Current role of the pharmacist in the hospital

Pharmacists work with physicians in prescribing medication
<i>Managing the pharmacy</i>
Troubleshoot BCMA (Bar Coded Medication Administration)
Review budget for medication
Creating pharmacy schedule
Safety huddle meeting to improve quality of care
Attend meetings with pharmacy and therapeutics committee
Pharmacists fill in for pharmacy techs when required
<i>Quality of care</i>
Provide medication to patients for free
Provide information about assistance programs from drug manufacturers

Pharmacists do pharmacokinetics
Each pharmacist is responsible for their work
<i>Patient safety</i>
Pharmacists work with CPOE (Computerized Provider Order Entry) to process orders
Pharmacists verify Pyxis orders
Pharmacists review lab reports
Pharmacists prepare medication
Pharmacists ensure medication streamlining is done
Medication reconciliation
Participate in discharge rounds

- I. Managing the pharmacy: The pharmacy manager reported performing activities such as creating a working schedule of all the pharmacists every week, reviewing the budget for medications every quarter and attending a monthly safety huddle meeting with the managers of other departments. The safety huddle meeting helps to determine any issues from the pharmacy department that affect the safety of the patients. In addition, the pharmacy manager reported attending pharmacy and therapeutics committee meetings where they determine the drug formulary. Staff pharmacists also expressed that pharmacy technicians are sometimes busy preparing medication for patients, and pharmacists fill in for pharmacy technicians to dispense medication to outpatients. Currently, this is the only interaction between the patients and pharmacists.

- II. Pharmacy workload: The pharmacy manager believes that there is no excess workload for the pharmacists and the manager is investigating for more opportunities to improve patient safety where possible. Whereas, the staff

pharmacists felt that their workload is very high and they discussed the need for the hospital to recruit more pharmacists to cope with the current workload.

- III. Current activities in the hospital: Pharmacists reported that their current role includes tasks such as assisting physicians in prescribing medication and recommend medication based on the cost.

'We will answer questions that physicians will call because they need assistance in either prescribing a medication or something they're diagnosing, they need to have input on what would be the proper medication.'

Pharmacists also expressed that, to improve quality of care, they do pharmacokinetics². This helps the pharmacist recommend drugs to patients based on their health condition.

In addition, pharmacists also mentioned that they suggest drug assistance plans from drug manufacturers and provide free samples of medication to some of the patients who can afford them to ensure the patients' adhere to their medication schedule.

Furthermore, pharmacists reported that they perform medication reconciliation where they clarify the medication that patients take at home. This is done to ensure that patients are not prescribed any drugs that interact with the drugs taken at home.

'Medication reconciliation is say you, when the patient comes in, you look at, you have a, usually a medication lists go from one place to another so the

² Pharmacokinetics: The branch of pharmacology concerned with the movement of drugs within the body (74).

patient should have a, you know, medication list they bring from home or it's already in the computer. And so what you do is, medication reconciliation is making sure what's on whatever list, whether it's in the computer or the list that the patient brings into the hospital like on a paper form, you just go over and make sure that what's on the list, if they're still taking it. Then if they're still taking it, making sure that they're taking it like they're supposed to.'

In addition to the above tasks, pharmacists mentioned that they work with computerized provider order entry (CPOE) to process orders prescribed by the physician, participate in discharge rounds, and prepare medications for the patients. Pharmacists also stated that they ensure medication streamlining is done for patient safety.

'We make sure of that by meds streamlining, you know, where drug purpose, drug class, average dose and if right meds are given to the right patient to avoid any medication event'

RQ1: What are the perceptions of pharmacists on their current role in the discharge process?

Pharmacists indicated that they play a very limited role in the discharge process, which includes answering questions from physicians about the cost of medication and performing discharge rounds. As a part of discharge rounds, pharmacists review medications of about 60 patients per day. In the discharge rounds, pharmacists are presented with medication charts of the patients, pharmacists then review the culture

results of the patients and based on the culture results, they recommend medications to physicians regarding patients. Table 3.2 provides the list of codes for research question 1.

Table 3.2: Codes for research question 1

<i>Current role in the discharge process</i>
Pharmacists work with physicians in prescribing medication
Review patient medication for drug-drug interactions
Participate in discharge rounds
Change the dosage of the medication based on patient's health condition

RQ2: What are the perceptions of pharmacists on their ideal role in the discharge process?

When pharmacists were asked about their ideal role in the discharge process, they also expressed their perceptions regarding patients' capacity to comprehend instructions, education level and communication gap between pharmacists and patients. Table 3.3 provides the list of codes for research question 2.

Table 3.3: Codes for research question 2

<i>Pharmacists perceptions of patients</i>
Patients' limited capacity to comprehend instructions
Assess patient education level
<i>Communication gap between pharmacists and patients</i>
Patients don't understand the importance giving information
Pharmacists play an indirect role in the hospital
<i>Ideal role of the pharmacist in the discharge process</i>
<i>Teamwork</i>
Pharmacists work with physicians to prescribe medications
<i>Increasing communication between patients and pharmacists</i>
Increasing the availability of the pharmacists
Study the current discharge process
<i>Patient home health training</i>
Pharmacist devoted to discharge process

Life coach counselling
Counselling should happen at home
One time discharge is ineffective
Provide discharge counselling
Summary of medication
Discharge instructions tailored to patients
Follow up after discharge to ensure no med events
Preparing before discharge counselling adds to workload
Limited number of patients
Patients pay attention to information provided by the pharmacists

- I. Patients' limited capacity to comprehend instructions: Pharmacists expressed that the amount of information presented to the patients in the discharge process is vast. They believe that patients may be eager to leave the hospital and therefore their capacity to retain the information might be low.

'I figure and it's like too much information, who's looking at all that stack? I'm sorry. I mean, I have a mother that's elderly and we've been there, you know. It's like duh...'

'When patients are ready to go home, they are thinking of one thing. I want to go home. I want to get out of the hospital. I want to go home where it's comfortable, safe, and I can get back into my routine. So retention on anything may be low. That would be my concern as a pharmacist. Because you're reviewing, some of these patients have up to 20 different meds. And if you're reviewing all of them, you're not, they're not going to be able to comprehend that on a short-term basis.'

- II. Assess patient education level: Pharmacists also feel that the education level of some of the patients is low. Because of this, pharmacists suggested that the patient's education level should be assessed first to help pharmacists modify the way they represent information to the patient to ensure patients understand the information in the discharge process.

'Their educational level is something that has to be assessed because a lot of these patients, you know, may or may not have the capacity to understand what we're trying to tell them. So that's a big component.'

- III. Communication gap between pharmacists and patients: Pharmacists feel that their roles are significant for patient safety but go unnoticed by the patients. This may be on account of the pharmacists not directly interacting with the patients.

'I don't think they realize that pharmacists, you know, do look at their medications while they're here and make sure they're on safe and the medications are safe for them while they're here.'

'Pharmacists have always been kind of the force behind everything. We're there. What I like to think of is we're the engine because we have to produce the medications that are going to make these patients well, but we're not in front of them every single day. We're the quiet behind the scenes, you know, benefactor or however you want to look at it.'

- IV. Ideal role of the pharmacists in the discharge process: The above mentioned perceptions about the patients lead the pharmacists to frame their ideal role in the

discharge process. Below is the list of activities and tasks that pharmacists were willing to perform in the discharge process in addition to their current role.

- a. *Teamwork*: Pharmacists mentioned that they would like to work with physicians, as a team, in the discharge process by recommending the medications on the basis of cost, disease state of the patient, and current medication the patient is on.

'My ideal role would be including the pharmacist side by side with the physician in the discharge process to see what medications the patient is on, what medications the patient is prescribed and recommend the physician then and there regarding the patient's medication'

- b. *Increasing communication between patients and pharmacists*: Pharmacists would also like to reduce the communication gap with the patients by increasing their availability. Immediately following the discharge counselling provided by nurses, pharmacists indicated that they would like to answer patients' questions about medication.

'Yeah, that's what I'm, I guess just being available. I don't know how we could do it. But, you know, when the patients are discharged, just go, hi, you know, the pharmacists go by, nurse, nurse does the charge. But I guess, you know, maybe going and interviewing a patient, see if they have any questions about any of the medications they're on before they leave the hospital'

- c. *Patient home health training*: Pharmacists showed a keen interest in patient education during the discharge process. Pharmacists indicated that they were not conversant with the current discharge process and expressed the need to study it in order to augment it. One of the pharmacists expressed the need for a pharmacist solely dedicated to the discharge process to reduce the workload on other pharmacists and to also increase patient safety.

Pharmacists had distinct views on how to provide discharge counselling to patients. One of the pharmacists believed that patients may be eager to leave for home and therefore may not be willing to listen to the discharge instructions provided to them. The same pharmacist believed that counselling should be provided at home multiple times so that patients understand the instructions clearly.

'Because a lot of them, there's too much going on in their lives. And that's why I will term this again, it needs to be lifetime coaching counseling, not just one time, because that's going to be fruitless.'

On the other hand, two of the pharmacists believe that one-time discharge counselling given to the patient before leaving the hospital is effective as long as the discharge instructions are tailored to the patients and contain a summary of their medication. Pharmacists also expressed that the preparation before counselling may add to the workload. Therefore, the number of patients assigned to each pharmacist for

discharge counselling must be limited. Pharmacists also believe that follow-up after the discharge at the patients' homes is equally important for patient safety.

'I don't provide any discharge counselling as of now. But I would like doing that. That's a bit challenging. I have to prepare before counselling each patient. I have to learn about patient habits and also about the current patient medications. I would have to tell him about changing his activities or tasks at home. This could reduce the medication events.'

RQ3: What are the perceptions of patients on the role of pharmacist in the discharge process?

During the interviews, patients expressed their perceptions of the community pharmacists and clinical pharmacists. Table 3.4 provides the list of codes for research question 3.

Table 3.4: Codes for research question 3

Community Pharmacists:
Provide reminders to fill prescriptions
Provide written instructions
Provide oral instructions
Answer questions on medication
Help patients with Over The Counter (OTC) medications
Clinical pharmacists:
Pharmacists prescribe medication
Pharmacists play an indirect role in the hospital
Pharmacists fill prescriptions at the hospital
Pharmacists don't improve the discharge process

<i>Knowledge of the pharmacists</i>
Pharmacists are as knowledgeable as doctors regarding medication
Pharmacists are knowledgeable about the cost of medication
<i>Patient safety</i>
Pharmacists ensure correct dosage
Pharmacists ensure correct drug
Pharmacists verify the medications taken at home
<i>Assist in medication related problem Solving</i>
Pharmacists answer questions on medication
Pharmacists are great educators regarding medication

- I. Community pharmacist: When asked about the role of a pharmacist, most of the patients instead discussed the activities of a community pharmacist as they had not had contact with a pharmacist in the hospital. According to patients, community pharmacists ‘provide reminders to fill prescriptions’, ‘provide written instructions’, ‘provide oral instructions’, ‘answer questions on medication’ and ‘help with OTC (Over The Counter) medications’.

- II. Clinical pharmacist: Of the sixteen patients interviewed, three were under the impression that ‘pharmacists had no role in the discharge process’ and two of these three patients explained that the ‘pharmacists have no role in the hospital.’ Three other patients thought that ‘pharmacists do not improve the discharge process.’ These perceptions of the patients may be attributed to the fact that clinical pharmacists do not interact with the patients.

‘Well, they really don’t have a role here. They have it after I get out, they do, but not here at the hospital.’

In addition to the above perceptions about clinical pharmacists, two patients also believed that pharmacists play an indirect role in the hospital.

Furthermore, one patient presumed that pharmacists prescribe medications but the majority of patients expressed that pharmacists fill prescription medications at the hospital.

‘They make it, they make sure that whatever the nurses puts in that I got to have, they make sure that I have it. My medications, I get, it comes from them. I get my prescription filled at the hospital’

A few patients also discussed their perceptions related to clinical pharmacists’ knowledge and pharmacists’ role related to problem solving and patient safety. Each of these is discussed below.

- a. *Knowledge of the pharmacists:* Patients expressed positive feelings about the clinical pharmacist. They believe that pharmacists are as knowledgeable as physicians regarding medication and patients can approach them when they encounter a problem.

‘And it’s, they, to me, they know just almost as much as the doctor would know when it comes to medication’

Patients also believed that pharmacists are knowledgeable about the cost of medication and can help them with alternate drugs when a medication is unaffordable.

- b. *Assist in medication related problem solving:* It was also indicated by the patients that clinical pharmacists can answer questions on medication

face-to-face or via the phone. Patients also mentioned that pharmacists are great educators regarding medication.

'I mean, if you had any questions about your medications that the nurse couldn't answer, it might be helpful to have one to speak to. They tell you about your medication and how to take them and what not to take with them. The last time.. I think in this hospital, one helped me with my doubts, It was helpful'

- c. *Patient safety*: Patients believe that pharmacists play a vital role in ensuring the safety of the patient during their stay. One patient indicated that pharmacists verify the medication upon admission and ensure that there are no drug-drug interactions in the hospital. Patients are also aware that pharmacists verify the dosage and ensure that the right drugs are given to the right patients.

'I know that they did have to verify all of my medicines and everything the first day that I came in. I never actually talked to them, but I know that they did specifically go through all of my medicine before . . .'

Suggestions to improve the role of the pharmacist in the discharge process were minimal at best, because most of the patients were not aware of the role of a clinical pharmacist. Patients suggested that a visit from a pharmacist would benefit them in getting their questions answered.

'So I think it's a good idea if the pharmacist would make a visit before patient go home.'

CHAPTER FOUR

DISCUSSION & CONCLUSION

From the results, it was observed that pharmacists currently perform several tasks such as medication reconciliation, discharge rounds, preparing medication, processing orders using CPOE, and pharmacokinetics. However, it was observed that the pharmacist role in the hospital does not involve any interactions with the patients. Therefore, pharmacists suggested that ideally, their involvement in the discharge process should include discharge counselling, increasing their availability to patients, and working as a part of team with physicians. When analyzing the data, it was discovered that the results best aligned with Systems Engineering Initiative for Patient Safety (SEIPS) 2.0 model (59). Therefore, below a description of SEIPS 2.0 model is provided followed by a discussion and interpretation of the results framed by SEIPS 2.0 model.

SEIPS 2.0 model and its application to this study

The SEIPS 2.0 model originated from the SEIPS model (59). The general structure of the SEIPS model is that the socio-technical work system produces work processes which in turn shape the outcomes (60). The SEIPS model uses the work system model to characterize interactions between people and their environment and parallels Donabedian's structure-process-outcome model of healthcare quality (60). According to the work system model, a person performs a range of tasks using various tools and technologies. The performance of these tasks occurs in a physical environment and under

specific organizational guidelines. The five components of work system (persons, tasks, tools and technologies, physical environment, and organizational factors) interact and influence each other (61-63). The interactions between various components produce different outcomes such as better or worse performance, safety and health, and quality of working life.

According to Donabedian's model of healthcare quality (64, 65), the structure (work system) of an organization affects how safely the care is provided (process) and the means of caring for and managing the patient (process) affects how safe the patient is (outcome). The SEIPS model combines both the work system model and Donabedian's healthcare quality model. According to SEIPS model, the work system in which care is provided affects both the work and clinical processes which in turn influence the patient, employee and organizational outcomes of care. Changes to any aspect of the work system will affect the work and clinical processes and the consequent patient, employee and organizational outcomes (60).

SEIPS 2.0 retains the key properties of the original model and includes several clarifications and additions. In the SEIPS 2.0 model, there are six interacting components in the work system: person(s), tasks, tools and technologies, organization, internal environment and external environment.

The most significant change between SEIPS and SEIPS 2.0 is the decomposition of the work processes based on who is actively engaged in performing them. SEIPS 2.0 differentiates the work activities into professional, patient and collaborative work. Professional work is work that healthcare professionals are directly involved in

performing the tasks with minimal or no involvement from patients. Patient work is that in which the patient is directly involved in performing the tasks with minimal or no involvement from healthcare professionals. Collaborative professional–patient work is that in which both patients and healthcare professionals are directly involved. The work processes in SEIPS 2.0 model includes agents and co-agents. An agent is someone who performs some or all of the health-related work activity while a co-agent is an indirect or passive contributor (59). Thus in professional work, the agent is healthcare professional(s) and the co-agent is the patient and/or family.

In this study, the types of work processes observed are as follows:

Patient work: Once the patients reach home, they have to manage their health without any assistance from a healthcare provider. Patients are the active agents in this type of work.

Professional work: From the results, it is clear that pharmacists perform several activities such as preparing medication, reviewing medication charts, medication reconciliation and discharge rounds. However, they do not interact with patients in any part of their role indicating that their role comprises only professional work. Pharmacists are the active agents in this type of work.

Collaborative work: In their ideal role, one of the pharmacists suggested that discharge counselling should be provided at home multiple times. This may ensure that patients understand the instructions provided to them. In addition, two other pharmacists suggested a collaborative care technique by providing discharge instructions to patients

before leaving the hospital and answer patients' questions regarding medication. In this type of work, pharmacists and patients would both be active agents.

This patient education process proposed by the pharmacists can increase the communication between the pharmacists and patients. Other researchers have established that pharmacist–patient communication is not only important for improving appropriate medication use but also for achieving desired patient outcomes (66). Furthermore, it is observed that discharge counselling by pharmacists (Pharmacotherapeutic counselling) can enhance patient compliance to medication (37) and significantly reduce the risk of ADEs (37, 67). Al Rashed et al (68) reported that pharmacotherapeutic counselling significantly reduced the rate of readmissions and emergency department visits within 30 days after discharge.

In addition to the changes to the work processes, pharmacists also suggested changes to their current work system. Changes to organizational structure include limiting the number of patients pharmacists deal with so that the workload is not increased, discharge counselling provided by the pharmacist instead of the nurse, and increased availability of pharmacists for the patients. Changes to their tasks include preparing for discharge counselling, providing discharge counselling and increased teamwork with physicians. Changes to tools and technology include follow-up phone call to patients after they leave the hospital. Changes to the internal environment include providing discharge counselling in the patient's home setting. No changes were suggested for external environment component.

Furthermore, it was also observed that patients' perceptions did not match the current role of the pharmacist. Even though, high-risk readmission rate patient population are considered to be the expert healthcare users (76), there were no differences observed in the perceptions of high-risk readmission rate and low-risk readmission rate population. In addition, three patients interviewed did not know about the role of the pharmacist in the discharge process and two of those three patients were not aware of role of a pharmacist in the hospital. It is noteworthy that the only patients who are aware of the role of a hospital pharmacist are those with a background of working at a hospital. The other patients were under the impression that hospital pharmacists only dispense the medication. From the observations, it was noted by the researcher that these perceptions may be the result of patients not interacting with the clinical pharmacists while at the hospital.

It was also observed that the pharmacy manager did not feel that the workload was high whereas all of the staff pharmacists interviewed expressed that there is a high workload and more pharmacists need to be hired to compensate the workload. This lack of communication between pharmacists and pharmacy manager indicates conflict in the workplace. Currently, pharmacists assist physicians in prescribing medications to patients by answering questions and recommending medication to physicians on the basis of the cost of medication. Pharmacists suggested that they prefer to accompany the physician in the discharge process and recommend medication on the basis of the disease state of the patients. This demonstrates the pharmacists' willingness to work in teams to increase patient safety. Research shows that building collaborative working relationships with

physicians, nurses and nonclinical office staff is a cornerstone of team development and is recognized as being critical to the ability of pharmacists to improve patient outcomes (70).

From this study, we can see the current role of the pharmacists and the roles they are willing to perform. From other research, it has also been observed that pharmacist interventions in the discharge process are beneficial to patients (33-48, 67, 68, 70). Incorporating the suggested changes from the pharmacists into the work system and adding a collaborative work process could increase patient safety and improve the satisfaction for pharmacists as well.

Limitations

This study was conducted with only 5 pharmacists at one hospital and thus the findings cannot be generalized to all clinical pharmacists. However, the information gathered from the interviews will be useful to enrich the current research and can also be used as a basis for further studies. Another limitation is that two of the pharmacists did not agree to audio record the interviews. Therefore, some of the information may be lost since the interviewer was not able to capture all the details. In addition, only one interviewer conducted the interviews with the pharmacists. Furthermore, some of the patients were eager to leave the hospital after receiving the approval for discharge and were not attentive during the interviews. Data collected was self-reported and this data could not be independently verified by the researcher.

Conclusion

From the results, it is observed that patients are not aware of the current role of the pharmacist in the hospital discharge process and much of this is probably due to the fact that they have no interaction with clinical pharmacists while in the hospital. It is also observed that pharmacists are willing to perform tasks such as working with physicians in teams and discharge counselling to reduce the communication gap with the patients. This study is unique since it involves patients' perspective on the role of a pharmacist in the hospital discharge process. SEIPS 2.0 model was used to better understand and integrate the role suggested by the pharmacist into the current work system. Future research may focus on conducting a similar study in a larger hospital with a larger pharmacist sample size to understand the barriers for pharmacists in achieving their ideal role. An additional study should consider the economics of adding their ideal tasks to the current role of the pharmacists and should determine a cost efficient model. Also, research should be conducted to compare patients' perceptions pre and post pharmacist intervention.

APPENDICES

Appendix A

Patient Interview Protocol

1. When was the last time you saw a pharmacist?
 - a. When was the last time you had a conversation with a pharmacist?
 - b. Can you describe that discussion?
 - c. How would you describe your relationship with your pharmacist?

2. Have you talked to a pharmacist while in the hospital?
 - a. If yes: Can you tell me about that conversation? Was this conversation helpful to you?
 - b. What do you think a pharmacist does in the hospital?
 - i. How do you think pharmacists in the hospital help you to get ready to leave the hospital?
 - ii. How helpful do you think hospital pharmacists are in getting you ready to leave the hospital?
 - iii. How could hospital pharmacists help you in taking care of yourself after leaving the hospital?

Appendix B

Pharmacist Interview Protocol

1. How long have you been a practicing pharmacist?
 - a. How long have you been working here?

2. What kind of interactions or discussions do you have with patients?
 - a. Can you give me examples?
 - b. Can you walk me through a typical day at work for a pharmacist in this hospital?
 - c. How does your role impact the patient outcomes?

3. What role do you play in the patient discharge process?
 - a. Which of these activities or tasks are officially required of you during the discharge process?
 - i. Do you do any other activities that are not required of you to support the discharge process?
 - b. How do you support (help) the patients during the discharge process?
 - i. Enough time? Burden?
 - c. How could involving a pharmacist benefit the discharge process?
 - d. In what ways do you think a pharmacist can you help improve discharge process?
 - i. Efficiency?
 - ii. Patient (education)?
 - iii. Medication related (med reconciliation or errors)?
 - e. How would you have to modify your current role, in order to be more involved in the discharge process from the patient's perspective?
 - i. Increase patient contact?
 - ii. Do you think patient perspective of a pharmacist role is important?
 - f. If you could decide, what would be a pharmacist's ideal role in the patient discharge process?

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