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Quality of Handoffs in Community Pharmacies

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Introduction

A large volume of prescriptions is dispensed in community pharmacies across the United States. A 2016 IMS-Health report estimated that approximately 58,000 community retail pharmacies in the U.S. dispense over 4.4 billion prescriptions each year.¹ The increase in aging population², growing burden of chronic diseases³, and expansion of health insurance coverage as a result of the Affordable Care Act⁴ are all projected to increase the demand for healthcare services, including those from community pharmacies.

Community pharmacy managers have responded to the increases in service demands created by such high prescription volumes by hiring additional pharmacy staff who typically work in 8–12 hour shifts. Managers also heavily utilize part-time, float, and relief pharmacists. Since most pharmacists cannot be present for the entire period a pharmacy is open, prescription and other patient information usually need to be transferred between themselves during shift changes in order to ensure that prescriptions are dispensed safely.⁵ That is, exchange of information, responsibility, and accountability—referred to as a handoff—must occur when one pharmacist concludes a shift and another replaces this outgoing pharmacist at the beginning of a new shift within the same pharmacy. Unfortunately, the process itself is inherently prone to breakdowns and creates opportunities for errors.⁶

To dispense prescription-only medications, community pharmacists must receive prescriptions, commonly transmitted electronically from an authorized prescriber, without the patient necessarily present in the pharmacy.⁷ When there is missing or confusing

information about the prescription or patient that requires clarification (e.g., a potential drug-drug interaction or incorrect dosing), that problem must be addressed by the pharmacist before the medication can be dispensed. If resolution is not possible during a pharmacist's shift, information regarding the outstanding issue must be conveyed during the shift change via a handoff. A previous study⁸ showed that, within community pharmacies, handoffs can occur either synchronously during a shift change or asynchronously when one pharmacist leaves when the pharmacy closes at the end of the day, and another opens the pharmacy the next morning. During a synchronous handoff, pharmacists can communicate information with each other and may discuss the issue at hand either face-to-face or via a telephone call. In asynchronous handoffs, on the other hand, pharmacists convey and receive information at different times, typically without clarification or discussion. Information transfer occurs by using communication tools that may include paper (e.g., leaving notes), computer (e.g., leaving notes in a dispensing software), or leaving a voice message.^{8,9}

Multiple studies conducted in hospital settings—including those during nurse shift changes^{10–12} and patient transfers from the emergency department to inpatient areas^{13,14}—have shown that handoffs are very common but performed poorly, often resulting in transfer of incomplete and sometimes conflicting patient information. Failures in communication accounted for 71% of sentinel events related to medication errors reported to the Joint Commission between the years of 2004 and 2012.¹⁵ Most of the studies and interventions to improve handoffs have primarily focused on hospital environments.^{16–18} There is a general lack of data regarding the nature and characteristics of handoffs that take place between pharmacists in a community pharmacy environment.

To date, only one study has been conducted characterizing handoffs between pharmacists in community pharmacy. Consistent with studies about handoffs in other health care settings, this qualitative study^{8,19} reported that handoffs are unstructured and highly variable in a community pharmacy setting. The next step in this research stream was to confirm the preliminary results of this small study.

Objectives

The objective of this study was to characterize handoffs in community pharmacies and examine factors that contribute to perceived handoff quality.

Methods

Survey Development

The community pharmacy handoff survey was developed in several stages. Initially, questions were conceptualized based on qualitative interviews that explored handoffs in pharmacies using eight pharmacists.⁸ Second, information was gathered from an extensive literature review, which led to survey items from previously validated instruments being adapted or modified.^{20–27} Prior to fielding the survey instrument, the draft questions were reviewed by experts from the study team and the University of Wisconsin-Madison's Survey Center. Inputs from this stage were incorporated and led to the final draft, which was then subjected to cognitive interviews²⁸ using five pharmacists. Questions were either revised

or removed based on results of the cognitive interviews. The final survey was then pilot tested using six community pharmacists in Minnesota. The final core of the survey, which contained 20 items, included a range of questions related to different aspects of handoffs in a community pharmacy setting. Out of these, 19 items were answered on a 5-point Likert type scale with the response categories from “never” (1) to “all the time” (5), or “not at all” (1) to “a great deal” (5). One item asked about perceived overall rating of the quality of handoff and was also presented as a 5-point Likert scale type from “very poor” (1) to “excellent” (5).

The community pharmacy handoff survey was administered as part of a larger survey that also included items from the Agency for Healthcare Research and Quality’s (AHRQ) Community Pharmacy Survey on Patient Safety Culture.²⁹ Three of the items from the AHRQ survey under the “*Communication about prescriptions across shifts*” dimension pertained to handoffs and were included in the analysis for this paper (shown in Table 2, under *Handoff Procedures*).

In addition to the core survey items, the survey also contained questions that collected information about pharmacist and pharmacy characteristics. Pharmacist related information included age, race, sex, job position, typical number of work hours per week, tenure in pharmacy, and perceived familiarity with patients. Pharmacy related information included pharmacy type (e.g., national chain, independent), average daily prescription volume, pharmacy staffing levels, location of pharmacy (urban or rural)-as determined by zip code approximation method using Rural-Urban Commuting Area Codes (RUCAs).³⁰

Data Collection

The University of Wisconsin Survey Center conducted the administration of the survey and was responsible for its fielding, data entry, and quality assurance. Our sampling frame was a list of 1725 registered pharmacists obtained from Wisconsin Department of Safety and Professional Services who opted in to receive mail. In order to identify community pharmacists in our sample, a screening survey was sent to a random sample of 1000 home addresses of pharmacists in January 2013. To be eligible for the study, pharmacists should have practiced in a community pharmacy for the past 12 months. When the screener yielded fewer eligible community pharmacists than was planned, a second screener survey was mailed to the remaining 725 pharmacists on the mailing list. In total, 543 community pharmacists were identified as eligible to receive the full questionnaire. Figure 1 shows the data collection plan.

Up to four attempts were made to contact eligible participants. In the first wave, participants were sent the questionnaire, a cover letter, a \$2 bill, and postage-paid return envelope. In the second wave, a postcard reminder was sent to all sampled participants. In the third and fourth waves, those who had not returned the completed the questionnaire were sent another questionnaire in a postage-paid return envelope without the incentive. All mailings of questionnaires occurred between April and June of 2013. The study was reviewed and approved by the Institutional Review Board at the University of Wisconsin–Madison.

Analysis of Data

Data were analyzed using STATA® version 13 (Stata Corp, College Station, TX). Responses were summarized and presented using descriptive statistics (mean, median, frequency, percentage). Some of the response categories had few respondents and as a result the five response categories were collapsed into three. This was done by combining the lower two and upper two categories to form one category for each. The middle category remained unchanged.

Bivariate analyses were conducted to identify significant associations between the independent variables and the outcome variable of interest (overall rating on perceived quality of handoffs). Variables with significant associations were identified and included in a multivariate ordered logistic regression model to determine predictors of the perceived quality of handoff. The Brant test of proportional odds assumption held true. The independent variables included in the final model were pharmacy type, pharmacist type, 24-hour pharmacy, prescription volume, tenure, degree of familiarity with patients, location of pharmacy, tenure in pharmacy, and percentage of synchronous handoffs. Analysis was done using a 95% confidence level, and a p-value less than 0.05 was considered statistically significant.

Results

Out of the 543 screened community pharmacists, a total of 445 completed questionnaires were returned yielding a response rate of 82%. Half of the respondents (51%) practiced in a pharmacy of the national chain, mass merchandizer or grocery store type. The majority of pharmacists included in the survey did not have a 24-hour operation and about two thirds of them were located in an urban area. The median prescription volume on a typical weekday was 250 prescriptions.

Almost 60% of the respondents were male and the median age was 52 years. Respondents practiced in their pharmacy for an average of 9 years with the median being 6 years. The majority of respondent pharmacists had a full-time staff or managing position in the pharmacy and most of them reported that they were very familiar or extremely familiar with the patients frequenting their pharmacy. Table 1 shows basic characteristics of respondents and their pharmacies.

The majority of pharmacists responded positively to questions relating to handoff procedures including: expectations about exchange of prescription information across shifts, availability of standardized communication processes, and communicating problematic prescriptions across shifts.

Nearly 70% of pharmacists reported handing off information to another pharmacist often or all the time. A similar percentage of the pharmacists reported receiving sufficient details about outstanding issues from an outgoing pharmacist at the beginning of their shift often or all the time. About 80% of pharmacists reported that they would provide sufficient details about outstanding issues to the pharmacist starting the next shift often or all the time. Close

to 50% of the pharmacists also reported that, sometimes or often, things “fall through the cracks” when handing off prescription issues from one pharmacist to another.

Over 90% of respondents reported almost no handoff training (formal school or in-service) while two-thirds of them reported staff in their pharmacy never or rarely discussed ways of handing off information. At least one-third of respondents reported that they sometimes encountered complaints from patients or conflicts with a prescriber or nurse as a result of poor handoffs. Over half of the respondents reported that they sometimes have to do additional work due to a poor handoff. Table 2 shows response frequencies as percentages.

Nearly 40% of the respondents reported that the dispensing computer system was a little or not at all helpful in facilitating the process of handing off information. Most of the respondents answered favorably to the following: trusting a pharmacist coming onto a new shift for resolving outstanding issues and confidence in resolving outstanding issues. Most respondents also answered favorably to questions about the level of comfort asking a fellow pharmacist during handing off information on site as well as off-duty and level of openness about being contacted by another pharmacist when off-duty. However, a greater number of respondents indicated comfort being contacted, versus contacting an off-duty pharmacist.

Most of the respondents (74%) reported that the perceived handoff quality was very good or excellent. Table 3 shows the percentages of responses.

Table 4 shows the results of a multivariate logistic regression analysis. Significant predictors of perceived handoff quality include: familiarity with patients, pharmacy location, prescription volume, 24-hour pharmacy, and percentage of synchronous handoffs.

Discussion

This study assessed characteristics of handoffs that occur between pharmacists in community pharmacies. Our results provide evidence that, like in other areas of healthcare^{31,32}, handoffs are very common and part of the routine work in community pharmacies. Importantly, nearly half of the respondent pharmacists reported that necessary information is not passed completely during shift changes, and that important handoff information “falls through the cracks”. A significant percentage of these handoffs are also performed in pharmacy environments full of interruptions or distractions. These conditions are ripe for errors which may eventually result in patient harm.³³ Perhaps, such high number of handoffs are likely to be reflective of the practice environments in which community pharmacists operate. These have generally been described as having a high production pressure³⁴ and, when handoffs are poorly performed, the threat to patient safety could be high due to a potential for missing critical information.

Poor handoffs can also contribute to the already high workload in community pharmacies.³⁵ This can especially happen as pharmacists try to locate missing information or rectify mistakes that resulted because of a poor handoff. In at least 50% of the time, our respondents reported that poor handoffs increased their workload. The resulting duplicative and unnecessary workload consumes useful pharmacist time that could otherwise be spent on direct patient care. These results are similar to findings reported by other researchers. Jagsi

et al., for example, described that resident physicians reported excessive work hours and problems with handoffs to be among the main reasons for mistakes that were contributory to adverse events experienced by their patients.³⁶ The high workload can in turn deplete pharmacists' cognitive resources, making them susceptible to making mistakes.^{37,38} The condition is further exacerbated due to lack of adequate technological support that facilitates a seamless transfer of information during shift changes. Nearly 40% of our respondents reported that the dispensing computer software in their pharmacy did not adequately support the process of handing off information.

In addition to the additional work that is required as a result of poor handoffs, pharmacists may also experience other negative consequences. For example, poorly conducted handoffs may result in conflicts between pharmacists and other healthcare providers such as nurses or physicians. The delay in provision of services can also cause patient dissatisfaction and increase the potential for their conflict with pharmacy staff. Indeed, our study showed that, in at least a quarter of the time, this was the case. These findings are also consistent with the results of a qualitative study conducted by Chui and Stone⁸, which showed that information that is confusing, contradictory or absent is among the potential reasons handoffs are usually done in a community pharmacy setting. This study also showed that pharmacists hesitated and, ideally, explored every other possibility before contacting an off-duty pharmacist to clarify issues that resulted from a poor handoff.

Training regarding proper handoffs was reported as minimal, suggesting the little emphasis given to the subject during the formative years of pharmacy school training. Even though there has been an increasing emphasis in formalizing handoffs in hospitals, the practice has lagged in community pharmacy. Use of mnemonics such as SBAR (Situation, Background, Assessment, Recommendation) are now becoming common in hospitals and increasingly being used to structure the communication process during handoffs.³⁹ Recently, the I-PASS mnemonic (illness severity, patient summary, action items, situation awareness and contingency plans, and synthesis by receiver) is also being implemented in hospitals in an attempt to improve handoffs and reduce medical errors.¹⁶ In community pharmacies on the other hand, the process occurs in a very haphazard fashion with little consistency among pharmacists.⁸ The recent call for U.S schools of pharmacy to incorporate situational briefing formats such as the SBAR as one of the core competencies for patient safety and quality improvement points to such an unmet need.⁴⁰

Our study also examined factors that were associated with handoff quality. Pharmacists who had lower daily prescription volumes were more likely to positively rate the quality of their handoffs. Perhaps this could be explained by the lower workload which might facilitate handing off patient information in an environment with little interruptions or distractions. Similarly, pharmacists working in pharmacies who open in the morning and close in the evening (e.g., do not operate 24 hours) were more likely to rate the handoff quality more favorably compared to their 24-hour counterparts. One might assume that handoffs conducted in a 24-hour store—where pharmacists provide synchronous face-to-face handoffs—would be of higher quality. However, our results do not support this assertion. In a 24-hour pharmacy, outstanding handoff information frequently must be conveyed twice. The outgoing evening pharmacist must convey information to the

overnight pharmacist. Because physician offices are typically not open in the evenings, this information needs to be conveyed to the morning pharmacist to be addressed. This double handoff phenomenon may result in loss of information and explain this disparity.

Consistent with evidence elsewhere⁹, higher percentages of synchronous handoffs occurring in a pharmacy were positively associated with improved handoff quality. This suggests that patient-related information transferred between pharmacists may be more complete if it is done in a face-to-face manner. Research in other disciplines has identified that face-to-face communication can offer individuals the advantage of visibility and audibility to improve sharing of information that is relevant to achieving shared goals.⁹ For example, Richardson and Dale demonstrated that listeners are more likely to develop better comprehension of a situation being described if they synchronize their gaze with that of the speaker.^{41,42} This is also consistent with results from the study by Chui and Stone⁸ which identified that pharmacists prefer synchronous handoffs.

Pharmacists who were familiar with their patients were more likely to positively rate the quality of their handoffs compared to those who were not. This is not surprising given the fact that pharmacists who know their patients well may have greater confidence in anticipating their needs and addressing outstanding issues. Similarly, pharmacists who practiced in pharmacies located in urban areas were more likely to positively rate quality of handoffs than those in rural areas. This may be explained by the relatively better pharmacy staffing pattern in urban areas compared to those of rural areas as rural pharmacies are likely to experience staff shortages.^{43,44} Consequently, this may limit opportunities for interactions between pharmacists and the conduct of face-to-face, synchronous handoffs during shift changes. After-hours coverage for pharmacy services in rural areas are also likely to be limited and, as a result, patients may be forced to obtain services from other places such as hospitals or pharmacies located in a different community.⁴³ The resulting fragmentation in service delivery may lead to loss of information, which in turn may contribute to poor handoffs.

Our study has important limitations that are worth acknowledging. First, our sample only included pharmacists from the state of Wisconsin, and thus the findings presented here may not be generalizable to other settings. Second, it is possible that our sample might have been subjected to selection bias as we used a sampling frame containing only 1725 pharmacists out of the total 5400 registered pharmacists in Wisconsin. These were the ones who opted in to receive mail and thus available to receive the survey via post mail. Lastly, with the exception of the AHRQ survey questions, this instrument had not undergone psychometric analysis.

Conclusion

Handoffs occur frequently and can be problematic in community pharmacies. Specifically, handoffs are associated with loss of information during shift changes. Frequent interruptions and distractions are potential contributors to poor handoffs, further adding to the high workload of pharmacists. Being more familiar with patients, urban location, low daily

prescription volume, not having a 24-hour operation and large percentage of handoffs occurring in a synchronous fashion are all associated with better handoff quality.

Our study only assessed perceived handoff quality and associated characteristics. Future research should confirm these perceptions using objective measures through observation of information elements that actually get handed over during shift changes. Since a large percentage of our respondents reported poor technology support and lack of formal training, potential interventions to improve handoff quality through continuing professional education and curricular changes in pharmacy schools, and technology specifically designed to facilitate documenting and sharing of information among pharmacists should be explored.

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Figure 1.
Flowchart showing data collection plan

Table 1

Descriptive statistics showing characteristics of surveyed pharmacists

Variables	Frequencies (%)
Pharmacy type	
National chain/Mass merchandizer/Grocer	225 (51)
Independent	135 (31)
HMO/Clinic affiliated	81 (18)
24 Hour Pharmacy	
Yes	26 (6)
No	417 (94)
Prescription volume per weekday	
Less than or equal 250	241 (55)
More than 250	198 (45)
Pharmacy setting	
Rural	139 (34)
Urban	266 (66)
Pharmacist position	
Staff/Managing Pharmacist	331 (74)
Float/Relief Pharmacist	92 (21)
Other	22 (5)
Familiarity with patients that frequent this pharmacy	
Unfamiliar/Slightly familiar	54 (12)
Somewhat familiar	125 (28)
Very familiar/Extremely familiar	264 (60)
Gender	
Male	264 (60)
Female	177 (40)
	Mean (SD)
Age	49 (14)
Tenure in current pharmacy	9 (9)

SD= Standard Deviation

HMO=Health Maintenance Organization

Table 2

General handoff information (n=445)

	Never/ Rarely (%)	Some Times (%)	Often/All the time (%)
Handoff Procedures			
We have clear expectations about exchanging important prescription information across shifts ^A	5	16	79
We have standard procedures for communicating prescription information across shifts ^A	18	21	61
The status of problematic prescriptions is well communicated across shifts ^A	5	17	78
Frequency of Handoffs			
How often do you hand off information to another pharmacist? ^B	8	24	68
How often do things “fall between the cracks” when handing off prescription issues from one pharmacist to another? ^C	52	43	5
How often is information handed off in an environment that is free from interruptions and distractions? ^D	46	29	25
How often do you receive sufficient details about outstanding issues from the previous pharmacist at the beginning of your shift? ^E	7	25	68
How often are you able to provide sufficient details about outstanding issues to the pharmacist starting the next shift? ^E	3	18	79
How often do you have sufficient time to hand off information to your partner pharmacists? ^E	11	26	63
Handoff Training			
Thinking back to your pharmacy school training, how much did your classes cover how to hand off information to other pharmacists? ^B	91	8	1
How often have you attended continuing education that addressed how to hand off information to other pharmacists? ^B	95.5	4	0.5
How often does your current pharmacy staff discuss ways of handing off information to other pharmacists? ^B	67	25	8
Handoff Outcomes			
How often do you hear complaints from patients that resulted from poor handoffs? ^B	56	38	6
How often does a poor handoff cause a conflict with a prescriber or nurse? ^B	67	31	2
How often does a poor handoff cause a conflict with a partner pharmacist? ^B	77	22	1
How often do you have to do additional work because of a poor handoff? ^B	48	46	6

^A Adapted from the Agency for Healthcare Research and Quality's (AHRQ) Community Pharmacy Survey on Patient Safety Culture.²⁹^B Developed by research team after literature review^C Adapted from the Agency for Healthcare Research and Quality's (AHRQ) Hospital Survey on Patient Safety Culture ²⁷^D Adapted from Wheat et al. (2012)²³^E Adapted from Gakhar, B., & Spencer, A. L. (2010)²⁴

Table 3

Communicating handoff information (n=445)

	Not at all/A little (%)	Somewhat (%)	Quite a bit/A great deal (%)
Technology			
To what extent does the dispensing computer system facilitate the process of handing off information? ^A	38	24	38
Handoff Resolution			
To what extent do you trust that the pharmacist coming on shift will resolve the outstanding issues? ^B	5	16	79
After you receive a handoff, how confident do you feel in your ability to resolve the outstanding issue? ^C	1	10	89
How comfortable are you asking clarifying questions to the pharmacist while he or she is handing off information to you? ^C	2	6	92
How comfortable are you contacting an off-duty pharmacist to clarify information that he or she handed off to you? ^A	20	20	60
How open are you to having another pharmacist contact you about the information you handed off when you are off duty? ^A	12	12	76
	Very poor/ Poor (%)	Fair (%)	Very good/ Excellent (%)
Overall, how would you rate the quality of handoffs you receive at the beginning of your shifts? ^D	4	22	74

^A Developed by research team after literature review^B Adapted from Gakhar, B., & Spencer, A. L. (2010)²⁴^C Adapted from Wheat et al. (2012)²³^D Adapted from Borowitz et al. (2008)²⁰

Table 4

Predictors of perceived handoff quality of a community pharmacy

Variables	Adjusted Odds Ratio	95% Confidence Interval
Pharmacist Type		
Manager/Staff/Other	-	
Float	1.20	0.65–2.22
Familiarity with patients *		
Unfamiliar/Slightly familiar	-	
Somewhat familiar	2.57	1.16–5.68
Very familiar/Extremely familiar	4.21	1.82–9.89
Tenure in this pharmacy		
Less than or equal 6 years	-	
Greater than 6 years	1.03	0.60–1.79
Pharmacy Type		
National Chain/Mass merchandise/Grocery	-	
Independent	0.96	0.53–1.72
HMO/Clinic	0.98	0.49–1.99
Pharmacy location *		
Rural	-	
Urban	1.80	1.07–3.02
Prescription volume *		
Greater than 250	-	
Less than or equal 250	2.22	1.27–3.88
24 Hours Pharmacy *		
Yes	-	
No	4.82	1.74–13.37
% Synchronous handoff *	1.02	1.01–1.03

* Statistically significant at $p < 0.05$