Evaluating Pharmacy Practice in Hospital Settings in Jeddah City, Saudi Arabia: Prescribing and Transcribing—2018

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Abstract

Purpose: The aim of this study was to evaluate the prescription and transcription processes in hospital settings in Jeddah city, Saudi Arabia. **Method:** A customized version of the original American Society of Health-System Pharmacists (ASHP) survey was distributed to a total of 26 hospitals in Jeddah city that fits our criteria starting from December 2017. Hospitals' names were adopted from the Ministry of Health and Jeddah Municipality websites. All questionnaires were collected in June 2018. After that, they were classified according to the type of care provided by the hospital, size, ownership, teaching affiliation, and accreditation. Data were entered electronically using Google forms, and then Microsoft Excel was used to conduct descriptive statistics. **Results:** The survey had a response rate of 57%. A strict formulary system was adopted in 53.3% of hospitals, and clinical practice guidelines were used to optimize medication use in 86.7% of hospitals. Pharmacists do not have the authority to write medication orders in about 86.7% of hospitals and only 40.0% of hospitals have pharmacists routinely assigned to patient care units. However, Pharmacists actively provided consultation, mostly in drug information (80.0%). Computerized prescriber order entry (CPOE) is used to receive medication orders electronically in 80.0% of hospitals, and electronic health record (EHR) is used in about 53.3% of hospitals and 50.0% of those hospitals have pharmacists who document their clinical intervention in EHR. **Conclusion:** Survey results suggest that pharmacists in hospital settings have not yet been positioned to improve the prescribing and transcribing components of the medication-use process.

Keywords

medication process, pharmacists, education, physician prescribing, clinical services

Introduction

The National Coordinating Council for Medication Error Reporting and Prevention defines medication error as “preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer.”¹ These errors can take place during all aspects of medication-use processes including prescribing and transcribing.²

Studies have shown various approaches to decrease medication errors such as implementation of computerized prescriber order entry (CPOE) systems,³ bar-code electronic medication administration record (eMAR),⁴ medication reconciliation,⁵ pharmacist transition of care programs,⁶ and clinical pharmacist interventions.⁷

These approaches although appeared to be effective in many countries, the availability and implantation of these approaches are varied from one country to another.⁸ Accordingly, there are limited studies regarding these approaches in general hospital pharmacy practice in Jeddah, Saudi Arabia.^{9–16} Therefore, a customized version of the American Society of Health-System

Pharmacists (ASHP) survey on prescribing and transcribing was used to originate data about the city of Jeddah, Saudi Arabia.

The ASHP national survey of pharmacy practice in hospital settings has been conducted in the United States since 1998. The survey concerns with the evaluation of the role of the pharmacist during six distinct processes: prescribing, transcribing, dispensing, administration, monitoring, and patient education and improvement. Two processes are studied each year. It has also been used by Alsultan et al^{17–19} to evaluate the hospital pharmacy practice in Riyadh in 2012 and 2013.

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This study generally focuses on the techniques that are used for formulary system management, actions on newly admitted patients on non-formulary oral medications, drug policy tools to improve medication use, types of pharmacist consultations, the extent of pharmacist's authority to write medication orders (modify and/or initiate therapy), type of data collected to evaluate pharmacist intervention services, and methods that are used to provide drug information to prescribers.

This study also demonstrates the primary method of receiving medication orders in the pharmacy, actions to ensure accurate transcription and transmission, technology in documentation and reconciliation, pharmacist review of orders and pharmacist role, and protocols on both of the antimicrobial stewardship program and insulin practice.

Method

The original ASHP survey was modified to include questions that apply to the Saudi health care system. New questions that are relevant to the research topics were added from Riyadh's survey,¹⁷ A total of 32 hospitals names were withdrawn from Jeddah Municipality²⁰ and the Ministry of Health²¹ websites. In December 2017, we contacted and visited each hospital. After excluding specialty and hospitals' sub-branches, a remaining total of 26 hospitals that fit the study criteria were left. A hard copy of the survey, as well as a soft copy, was provided to pharmacy directors or their representatives. The first follow-up was made in 5 months either by phone or by a personal visit. All questionnaires were collected and finalized in June 2018. All data were classified according to the type of care provided by the hospital, number of staffed bed, ownership, teaching affiliation, and accreditation. Data were enrolled electronically using Google form, and then Microsoft Excel version 1803 (Microsoft Corporation, Redmond, Washington) was used to conduct descriptive statistics.

Results

A total of 26 hospitals were contacted to participate in this survey. Of which, 15 hospitals responded, with a response rate of 57.7%.

Hospital Characteristics

The hospital characteristics are displayed in (Table 1): number of staffed beds, type of care, ownership, teaching affiliation, and accreditation.

Prescribing

Several formulary system management techniques are used in respondent hospitals (Table 2), most commonly: using

Table 1. Size, Type of Care, Ownership, Teaching Affiliation, and Accreditation of Survey Respondent Hospitals.

Characteristics	Hospitals (N = 15)
	Respondent no. (%)
No. staffed beds	
<50	2 (13.3)
50-99	1 (6.7)
100-199	3 (20.0)
200-299	1 (6.7)
300-399	2 (13.3)
400-599	3 (20.0)
≥600	3 (20.0)
Type of care	
Acute primary care	9 (60.0)
Acute secondary care	6 (40.0)
Acute general tertiary care	8 (53.3)
Acute specialty tertiary care	4 (26.7)
Chronic care	7 (46.7)
HIV center	1 (6.7)
Ownership	
Government hospital	10 (66.7)
Private hospital	5 (33.3)
Teaching affiliation	
Teaching institution	3 (20.0)
Teaching affiliated institution	2 (13.3)
Non-teaching institution	9 (60.0)
No response	1 (6.7)
Accreditation	
Accredited	10 (66.7)
Non-accredited	5 (33.3)

non-formulary prescribing data to generate Pharmacy and Therapeutics (P&T) committee discussion about product (53.3%), identifying specific products that require prior approval before patient use (53.3%), followed by systematically disseminating medication cost information to prescribers (eg included in printed formulary, antibiogram, and drug information software; 46.7%), using clinical decision support in CPOE systems to guide formulary compliance (46.7%), using standardized order sets to guide formulary compliance (40.0%), comprehensively review at least two therapeutic categories each year (20.0%), and other (20.0%).

Respondents were asked about their formularies status over the past 3 years, 53.3% of them leaned toward more limited formularies, while 33.3% of them remained the same, and 13.3% of them developed more open formularies. Respondents clarified the philosophies that they adopted on newly admitted patients stabilized on a chronic oral medication that is non-formulary. Most of the hospitals used patient own home supply of medication (53.3%). Meanwhile, 26.7% ordered the prescribed medication for the patient, 13.3% prevented this situation by developing a

Table 2. Formulary System Management Techniques Used by the Hospitals.

	Hospitals (N = 15)
	n (%)
Using non-formulary prescribing data to generate Pharmacy and Therapeutics (P&T) committee discussion about product	8 (53.3)
Identifying specific products that require prior approval before patient use	8 (53.3)
Systematically disseminating medication cost information to prescribers (eg included in printed formulary, antibiogram, and drug information software)	7 (46.7)
Using clinical decision support in computerized prescriber order entry systems to guide formulary compliance	7 (46.7)
Using standardized order sets to guide formulary compliance	6 (40.0)
Comprehensively review at least two therapeutic categories each year	3 (20.0)
Other	3 (20.0)

Table 3. Drug Policy Tools Used by Pharmacy and Therapeutics Committee to Improve Medication Use.

	Hospitals (N = 15)
	n (%)
Clinical practice guidelines that include medications	13 (86.7)
Restricting prescribing of certain categories of medications to certain specialties, or only with consultation	12 (80.0)
Comparing the effectiveness of products when making formulary decisions	8 (53.3)
Rationing of medications based on expected patient outcomes and cost of therapy	8 (53.3)
Traditional, restrictive formulary with a limited list of medications	7 (46.7)
Medication use evaluation	7 (46.7)
Formulary decisions made based on a rigorous pharmacogenomic threshold (eg cost-effectiveness analysis, cost-benefit analysis, or cost-utility analysis)	6 (40.0)
Making formulary decisions based on package labeling (eg avoiding off-label use)	6 (40.0)
Therapeutic interchange	5 (33.3)
Protocols that transfer authority for product selection and dosing from prescribers to pharmacy	4 (26.7)

formulary with multiple products in each therapeutic category, and 6.7% preapproved therapeutic interchange to an equivalent formulary product.

There are various drug policy tools used by P&T committees to improve medication use in their hospitals (Table 3). Most commonly: clinical practice guidelines that include medications (86.7%), followed by restricting prescribing of certain categories of medications to certain specialties, or only with consultation (80.0%), comparing the effectiveness of products when making formulary decisions (53.3%), rationing of medications based on expected patient outcomes and cost of therapy (53.3%), traditional, restrictive formulary with a limited list of medications (46.7%), medication-use evaluation (MUE; 46.7%), formulary decisions made based on a rigorous pharmacogenomic threshold (eg cost-effectiveness analysis, cost-benefit analysis, or cost-utility analysis; 40.0%), making formulary decisions based on package labeling (eg avoiding off-label use; 40.0%), therapeutic interchange (33.3%), and protocols that transfer authority for product selection and dosing from prescribers to pharmacy (26.7%).

Pharmacy directors reported some drug policy issues addressed by their P&T committee. The most common issue

was the process for managing drug product shortages (60.0%), followed by purchasing of medications from sources other than your primary wholesaler or direct from the manufacturer (eg through the "Grey Market"; 53.3%), outsourcing guidelines for compounded sterile products (46.7%) rationing of limited supply drugs (40.0%), and 6.7% of hospitals did not provide an answer. Most of the respondent hospitals' P&T committee meet mostly once a month and 4 times during the year (26.7%).

Several sources are typically used to develop a presentation and recommendation for the P&T committee, most commonly: using drug information (eg American Hospital Formulary Service [AHFS]/GOLD STANDARD/MICROMEDEX/UpToDate; 73.3%), pharmaceutical manufactures (66.7%), formulary monograph service/company (53.3%), PubMed search (53.3%), Internet search engine (eg Google, Bing, and Yahoo; 46.7%), wholesaler therapeutic review/monograph (20.0%), Cochrane collaboration review (20.0%), and group purchasing organization therapeutic review/monograph, health-system/corporate/central office (13.3%).

Pharmacist actively provided consultations (Table 4), mostly in drug information (80.0%) followed by dosage

Table 4. Hospital Use of Pharmacist Consultations.

Area of consultations	Hospitals (N = 14/15) ^a
	n (%)
Drug information	12 (80.0)
Antibiotic	10 (66.7)
Dosage adjustment	10 (66.7)
Patient teaching	10 (66.7)
Nutrition support	8 (53.3)
Pharmacokinetics	5 (33.3)
Anticoagulation (eg warfarin teaching)	5 (33.3)
Compliance medical history	4 (26.7)
Pain management	2 (13.3)
Other	2 (13.3)

^aIn this question, 14 out of 15 hospitals provided an answer.

adjustment, antibiotic, patient teaching (66.7%), nutrition support (53.3%), pharmacokinetics (33.3%), anticoagulation (eg warfarin teaching [33.3%]), compliance medical history (26.7%), pain management (13.3%), and other (13.3%).

Of all the hospitals, 86.7% reported that their pharmacists do not have the authority to write medication orders (modify and/or initiate therapy). Meanwhile, 13.3% of respondent pharmacists do have the authority. Respondents reported the extent of pharmacist's involvement in the drug-therapy management pharmacy services in specific patient populations (Table 5).

About 53.3% of hospitals do not have pharmacists routinely assigned to patient care units, while 40.0% of hospitals do and 6.7% of hospitals did not provide an answer. Overall, 60.0% of pharmacists with drug-therapy management responsibilities were evaluated for medication-related outcomes of patients under their care, while 33.3% were not evaluated, and 6.7% of hospitals did not provide an answer.

Pharmacists' responsibility for writing medication orders, selecting doses, ordering appropriate laboratory test, and monitoring patient response to therapy were mainly in anticoagulation (26.7%), nutrition (26.7%), antibiotic selection (13.3%), renal dosing antibiotics (6.7%), none (33.3%), and other (20.0%) (Table 6). Some (86.7%) of the respondents reported that they collected data to demonstrate the value of outcomes, length of stay (LOS), and number of interventions, while 6.7% indicated that they did not collect any data (Table 7).

Different types of data were collected for pharmacist intervention services (Table 7). Frequency was commonly reported (73.3%), followed by time (26.7%), outcomes (20.0%), cost saving (13.3%), Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores (6.7%), patient satisfaction (6.7%), and other (20.0%).

Drug information was delivered to prescribers primarily through staff pharmacists routinely answering questions (93.3%), continuing education programs (60.0%), formal drug information center (40%), newsletter and bulletins

(33.3%), stand-alone electronic drug information product available on terminals throughout the hospital (26.7%), pharmacist attending rounds (20.0%), electronic drug information embedded into CPOE (13.3%), disseminating results of MUE (6.7%), electronic drug information available on individual handheld devices/smartphone/personal digital assistant (PDA), and others (6.7%). The use of genetic tests for gene variants for drug or dosage selection was stated by the hospitals; 73.3% do not perform genetic testing, 20.0% did not know, and 6.7% confirmed the use of genetic testing.

Transcribing

The main method used to receive medication orders in the pharmacy was electronically through CPOE (80.0%). Followed by handwritten order (original or copy delivered to the pharmacy; 13.3%) and digital image capture (eg Pyxis® connect; 6.7%).

Several actions were taken by hospitals to ensure accurate transcription or transmission of medication orders. Most regularly, standard physician order forms/sets (66.7%), followed by all verbal orders, must be read back, including spelling the drug name, dose, dosage form, and name of the patient (60.0%), having eMAR (53.3%), verbal orders must be countersigned (46.7%), physicians must print any handwritten medication orders (46.7%), any illegible order is clarified before transcription/entry onto MARs (46.7%), MARs and pharmacy patient profiles are reconciled at least daily (40.0%), special transcribing procedures are used for high-risk drugs (33.3%), second nurse double checks written changes to MAR (26.7%), and having CPOE with interface to pharmacy computer system (20.0%).

Use of Technology

A total of 53.3% of hospitals reported having an inpatient electronic health record (EHR); 50.0% of their pharmacists denied documenting clinical interventions in the EHR, and only 50.0% of their pharmacists stated that they do. Overall, 73.3% of hospitals reported interfacing of CPOE with pharmacy computer system, while 13.3% of them denied interfacing of CPOE with pharmacy computer system, and only 13.3% do not have CPOE.

Of these hospitals, 53.3% denied the use of automated dispensing cabinets (eg Pyxis, AcuDose-Rx, MedSelect, and Omnicell), while 40.0% of them confirmed that they do use them, and 6.7% of hospitals did not provide an answer. About 13.3% of respondents used a smart infusion pump, and 100.0% of them reported that their nurses document volumes infused from smart infusion pump manually.

About 80.0% of hospitals denied the use of machine-readable coding (eg Bar-Code Medication Administration [BCMA]) system to verify the identity of the patient and the accuracy of medication administration at the point-of-care;

Table 5. The Extent of Pharmacist's Involvement in the Drug-Therapy Management Pharmacy Services in Specific Patient Populations.

Areas/patients	Hospitals (N = 15)				
	Not assigned	Assigned fewer than 8 hours per day or fewer than 5 days per week	Assigned 8 or more hours per day, at least 5 days per week	Do not have these types of patients	No response
	n (%)	n (%)	n (%)	n (%)	n (%)
Inpatient medical-surgical	8 (53.3)	2 (13.3)	3 (20.0)	1 (6.7)	1 (6.7)
Critical care	9 (60.0)	2 (13.3)	2 (13.3)	0 (0)	2 (13.3)
Cardiology	9 (60.0)	2 (13.3)	2 (13.3)	1 (6.7)	1 (6.7)
Oncology	9 (60.0)	2 (13.3)	1 (6.7)	2 (13.3)	1 (6.7)
Pediatrics	9 (60.0)	2 (13.3)	1 (6.7)	2 (13.3)	1 (6.7)
Neonatal	9 (60.0)	2 (13.3)	0 (0)	3 (20)	1 (6.7)
Obstetrics/gynecology	10 (66.7)	2 (13.3)	0 (0)	2 (13.3)	1 (6.7)
Operating room/preoperative room	12 (80.0)	1 (6.7)	0 (0)	1 (6.7)	1 (6.7)
Emergency department	10 (66.7)	2 (13.3)	2 (13.3)	0 (0)	1 (6.7)
Anticoagulation education	10 (66.7)	1 (6.7)	1 (6.7)	2 (13.3)	1 (6.7)
Infectious disease	8 (53.3)	3 (20.0)	3 (20.0)	0 (0)	1 (6.7)
Nutrition support	10 (66.7)	1 (6.7)	2 (13.3)	1 (6.7)	1 (6.7)
Pain and palliative care	11 (73.3)	1 (6.7)	1 (6.7)	1 (6.7)	1 (6.7)

Table 6. Pharmacists' Responsibility for Writing Medication Orders, Selecting Doses, Ordering Appropriate Laboratory Test, and Monitoring Patient Response to Therapy.

Medication therapies	Hospitals (N = 14/15) ^a
	n (%)
Anticoagulation	4 (26.7)
Nutrition	4 (26.7)
Aminoglycosides	0 (0)
Renally dosed antibiotics	1 (6.7)
Vancomycin	0 (0)
Pain and palliative care	0 (0)
Antibiotic selection	2 (13.3)
Other	3 (20.0)
None of the above	5 (33.3)

^aIn this question, 14 out of 15 hospitals provided an answer.

only 13.3% of them indicated that they use them, and 6.7% of hospitals did not provide an answer.

Medication Reconciliation

Respondents were asked whether they perform medication reconciliation upon admission, transfer between floors, and discharge of patients. Overall, 80.0% of them answered yes, and 20.0% of them answered no.

About 58.3% of respondents stated that the medication reconciliation was a paper-based system. Meanwhile, 33.3% of respondents indicated that it is a part of EHR and only 8.3% of them declared that it is a stand-alone electronic system.

Table 7. Collection of Data to Determine the Value of Pharmacists' Intervention Services.

	Hospitals (N = 14/15) ^a
	n (%)
Respondent performing data collection	13 (86.7)
Types of data collected	
Frequency of services (quantity and type)	12 (73.3)
Time	5 (26.7)
Outcome	3 (20.0)
Cost savings	2 (13.3)
Patient satisfaction	1 (6.7)
HCAHPS scores	1 (6.7)
Readmission rates	0 (0)
Decreased LOS	0 (0)
Other	2 (20.0)

Note. HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems; LOS = length of stay.

^aIn this question, 14 out of 15 hospitals provided an answer.

Pharmacist Review of Orders

Some (93.3%) of the surveyed hospitals had pharmacists' review and approved all medication orders before the first dose is administered, while 6.7% did not. Only 20.0% of hospitals reported that they are using off-site medication order review and entry technology during hours when the onsite pharmacy is closed, and only employee pharmacist (on-call at a remote location) provides that service in those hospitals.

Table 8. Antibiotic Stewardship Program.

No. and % with program	Hospitals (N = 15)												
	No. and % serving a primary role					No. and % using strategy				No. and % using approach to assess impact			
	Leadership and accountability	Data analysis	Clinical support only	Providing data	Not actively involved	Formulary restriction	Education and guidelines	Daily review and feedback	Computer assistance	Antibiotic utilization	Bacterial resistance and infection outcomes	Patient outcomes	Reduced expenditures and costs
13 (86.7)	6 (46.2)	3(23.0)	1(7.7)	1(7.7)	2(15.4)	12(92.3)	9(69.2)	5 (38.5)	4 (30.8)	12 (92.3)	8 (61.5)	7 (53.)	4 (30.8)

Antimicrobial Stewardship

Antimicrobial stewardship program was used in 86.7% of hospitals and only 46.2 % of their pharmacists showed leadership and accountability role in the program (Table 8). Meanwhile, 23.0% of pharmacists showed data analysis role, 15.4% were not actively involved, and 7.7% showed clinical support only.

Multiple strategies are used in the antibiotic stewardship program (Table 8). Most commonly: formulary restriction (92.3%), education and guidelines (69.23%), daily review and feedback (38.5%), and computer assistance (30.8%).

The primary approach of assessing the impact of the antibiotic stewardship program is antibiotic utilization (92.3%), followed by bacterial resistance and infection outcomes (61.53%), patient outcomes (53.84%), and reduced expenditures and costs (30.8%). Most of the hospitals stated that they did not use clinical surveillance software (92.3%) (Table 8).

Insulin Practices

Some (60.0%) of the hospitals developed standard concentrations for insulin infusions to all patient care areas; 66.7% of hospitals denied limitation of all insulin preparation to the pharmacy department; 73.3% of hospitals developed policies and procedures to ensure that insulin pens are used for individual patients only; and 60.0% of hospitals conducted a formal, structured strategic planning process in the last 24 months to determine their optimal level of services, use of automation and technology, assignment of technicians, and readiness of staff to serve.

Acquisition Costs

Regarding the total acquisition cost, none of the participants disclosed any financial information.

Discussion

There are limited information and studies regarding medication errors in the Middle East. Therefore, it is crucial to assess all aspects related to prescribing and transcribing to decrease the incidence of medication errors.²² Consequently, a customized version of the ASHP national survey of pharmacy practice in hospital settings which focuses on

prescribing and transcribing was performed in Jeddah, Saudi Arabia, with a total response rate of 57.7%, which resembled the response rate of a previous similar study done in Riyadh on 2012 (60.8%)¹⁷ and agreeably higher than the response rates of 29.8% of a similar study conducted in the United States by the ASHP in 2016.²³

Positive patient outcomes can be attained by implementing clinical pharmacy services.²⁴ The outcome of our survey suggests that several services that can be provided by pharmacists have not been activated. Such services include the authority to write medication orders (modify and/or initiate therapy), which had a percentage of 13.3 which compares unfavorably with the ASHP results that were conducted in 2016 (92.8%).²³

Pharmacist-provided consultations and monitoring are linked with lower rates of adverse drug events post discharge.²⁵ The results of our study indicated that pharmacist provided such consultations and they were mostly directed toward drug information (80.0%). This percentage was similar to Riyadh's survey (95.8%), which was conducted in 2012.¹⁷

Reconciliation can have a significant role in reducing potential medication errors.²⁶ The survey results indicated that 80.0% of surveyed hospitals perform medication reconciliation upon admission, transfer between floors, and discharge of patients, which was significantly higher than the results of Riyadh's survey (48.0%).¹⁷ Pharmacists also were the main source to deliver drug information to prescribers by answering their questions routinely (93.3%), compared to 74.1% in Riyadh city.¹⁷

Implementation of antimicrobial stewardship programs in hospitals can provide a substantial value in the clinical and the economic outcomes of antimicrobial use.²⁷ The results of our study showed that the implementation of antimicrobial stewardship programs was seen in 86.7% of hospitals, which compared favorably with the ASHP results that were conducted in 2013 (63.0%).²⁸

The ASHP foundation expert consensus panel developed recommendations to insure safer insulin practices.²⁹ Our surveyed hospitals implemented some of the recommendations such as establishing standardized concentrations for insulin infusion to all patient care areas (60.0%) and developing policies and procedures to ensure that insulin pens are used for individual patients only (73.3%).

CPOE appeared to be a useful tool in decreasing rates of adverse drug events and reducing the workload of hospital's

pharmacists and nurses.³⁰ Our results demonstrated that CPOE was the main method used to receive medication orders in Jeddah (80.0%), Riyadh (41.4%),¹⁷ and in the United States (90.7%),²³ while handwritten orders were 13.3% in Jeddah, 34.5% in Riyadh,¹⁷ and only 2.7% in the United States.²³

Digital image capture was used in a lesser extent in Jeddah (6.7%) and Riyadh (10.3%),¹⁷ but both remain higher than the average in the United States (4.2%).²³ Of the respondents, 73.3% confirmed that their pharmacy computer system interfaced with CPOE. While in Riyadh (14.8%),¹⁷ BCMA has shown to provide better compliance with patient identity.³¹ The use of BCMA was not implanted in Jeddah hospitals as indicated by the result of our study (13.3%) which was significantly lower than the result of ASHP survey in the United States (92.6%).²³

Some (50.0%) of the pharmacists in hospitals, who have EHR, stated that they are documenting clinical interventions in it. After hours, medication order review services can improve medication safety and alleviate nurses' workload³² and it is increasingly used in the United States.³³ However, our results demonstrated that only 20.0% of hospitals use off-site medication order review technology during hours when the onsite pharmacy is closed.

Conclusion

Survey results suggest that pharmacists in hospital settings have not yet positioned themselves to improve the prescribing and transcribing components of the medication-use process.

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