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Staff perceptions toward emergency clinical pharmacists in a Saudi Arabian academic emergency department

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Staff perceptions toward emergency clinical pharmacists in a Saudi Arabian academic emergency department

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Abstract

Introduction: In Saudi Arabia, the establishment of pharmacy services as a part of the emergency department is relatively new and has been run by non-residency-trained pharmacists and limited to non-emergency services. We sought to explore emergency department staff members' perceptions of clinical emergency pharmacy services in an academic emergency department.

Method: In this survey study, 24 questions were sent to all emergency department staff 9 months after establishing an emergency pharmacist program with the goal of improving medication safety and quality of care.

Results: Most, 122 out of 145 (84%), emergency department staff members responded to the survey. All 41 emergency department providers completed the survey, compared to 81 (78%) nurses. Half of the respondents had less than 1 year of experience working with emergency pharmacist. Two-thirds (66%) had consulted an emergency pharmacist at least once; however, 68% of providers had no contact with the emergency pharmacist. Almost half (46%) agreed that the emergency pharmacist's contribution to medication safety was maximized through the order review process, and more than three-fourths (77%) agreed that an emergency pharmacist should review all orders. Most respondents agreed that the emergency pharmacist improves the quality of care (89%), is an integral part of the emergency department team (86%), is more useful if located in the emergency department (87%); it is helpful if he or she checks medication orders before they are carried out (88%), enhances the emergency department staff's ability to deliver safe, quality care during medical resuscitations (85%), and is a valuable educator serving both patients (88%) and emergency department staff (77%). All respondents were in positive agreement with the different specific functions for the emergency pharmacist role.

Conclusion: The emergency department staff believes that an emergency pharmacist is an important part of the emergency department team, acts to maximize medication safety, contributes to the education of emergency department staff and patients, and improves the quality of care.

Keywords

clinical pharmacist, emergency pharmacist, emergency department

Introduction

Since the introduction of the clinical pharmacy concept in Saudi Arabia in 1979, the pharmacy profession has been advanced and led to many improvements in the health-care system.¹ According to The American College of Clinical Pharmacy, Clinical pharmacy is “a health science discipline in which pharmacists provide patient care that optimizes medication therapy and promotes health,

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wellness, and disease prevention. The practice of clinical pharmacy embraces the philosophy of pharmaceutical care, blending a caring orientation with specialized therapeutic knowledge, experience, and judgment to ensure optimal patient outcomes.² As a clinical pharmacist, one can provide general clinical services; however, a variety of subspecialty areas exist to encompass different patient populations. Among those sub-specialties is emergency medicine. An emergency pharmacist (EPH) is a clinical pharmacist who has completed a Doctor of Pharmacy (PharmD) degree and a general pharmacy practice residency program, followed by a specialty residency program in emergency medicine (EM).³

The number of hospitals in the United States that report the presence of emergency department (ED) clinical pharmacy services increased from 3.4% in 2006 to 16.4% in 2014, according to survey data.⁴ In 2011, the American Society of Health-System Pharmacists (ASHP) published guidelines on EM pharmacist services.⁵ In 2015, the American College of Emergency Physicians Board of Directors (ACEP) released a statement noting that pharmacists play a critical role in the ED and should be well integrated into the multidisciplinary team.⁶

The perceptions of ED physicians and nurses toward EPH in the ED have been evaluated in the literature.⁷⁻⁹ To our knowledge, the provision of pharmacy services in the ED is relatively new in Saudi Arabia, and limited to outpatient dispensing and medication history collection run by non-residency-trained staff pharmacists. At our institution, King Abdulaziz University Hospital (KAUH), we have implemented the nation's first clinical pharmacy service in an ED run via a residency-trained pharmacist specializing in the area of emergency medicine. The purpose of our study is to explore emergency physicians' and nurses' perceptions of clinical pharmacy services in the emergency department of an academic university hospital in Saudi Arabia.

Methods

We conducted a descriptive survey study of the ED staff at KAUH. The ED is an academic one, with about 64,000 visits per year. It has a relatively new 4-year EM residency-training program (established in 2012). The ED is staffed by providers (EM consultants and specialists) and nurses. The ED also has a pediatric emergency medicine (PEM) section with its own providers and nursing coverage. All providers and nurses were included in the survey. Residents were excluded, since their number is small and they have multiple off-site rotations. In September 2016, one clinical pharmacist established the EPH/EM pharmacist program at the KAUH-ED. The goal was to implement an accessible member to the ED multidisciplinary team in order to achieve the following: deliver bedside patient care evaluations, create a triage system to focus on patients with

critical illnesses, monitor both the effectiveness and safety of medications administered in the ED, participate in all resuscitation episodes, respond to medication information, and documentation requests.

Prior to implementing this program, pharmacy services available to the ED included using an automated pharmacy system to ensure the availability of floor-stock medications, running an intravenous (IV) room in the ED to provide fast service for any IV preparation requested for ED patients, and answering drug information questions via the drug information center. The EPH is a KAU Assistant Professor serving in the pharmacy faculty. He is the first Saudi clinical pharmacist to complete a specialized pharmacy residency training in EM. He is a board-certified pharmacotherapy specialist accredited through the Board of Pharmacy Specialties, and he holds certifications in basic life support and advanced cardiovascular life support from the American Heart Association. The funding that allows the EPH to work clinically at KAUH came directly from KAU. The EPH's responsibilities include direct patient care endorsement, antibiotics selection assistance, medication information and therapy monitoring, patient care involving high-risk medications and procedures, resuscitation participation, medication history intake and the reconciliation of admission orders, documentation, education, research, and scholarly activity. The EPH provides 4 h of daily coverage and is physically present in the ED 5 days per week.

The survey instrument was developed from three previous studies that assessed staff perceptions of EM pharmacists.⁷⁻⁹ The survey has 24 questions: 5 address demographics; 3 are general perception multiple-choice questions; and 16 are EPH specific, 5-point Likert scale questions (1—strongly agree, 5—strongly disagree). The survey was distributed to the whole ED staff by e-mail through Google forms (Google Inc.) in June 2017, after it was announced during a departmental meeting. We also distributed the survey via a frequently used smartphone application, WhatsApp (WhatsApp Inc.). ED administration provided the list of providers and nurses. All survey questions were mandatory to answer, and no sort of compensation was provided for completing the survey. The survey began with an electronic consent that was mandatory before respondents could proceed. The survey remained open for 1 month, and an e-mail reminder and text message, sent via WhatsApp, were sent 2 weeks after the initial distribution. Investigators were blinded to ED staff participation in the survey, since respondents only had to specify their role in the ED. This survey was approved by KAU's research ethics committee.

Responses from the survey were analyzed using descriptive statistics with Microsoft Excel (Microsoft Corporation, Redmond, WA). We combined "strongly agree" and "agree" into a single category and combined "disagree" and "strongly disagree" into a single category. We calculated the mean for

each Likert scale question and the 95% confidence intervals around the proportions.

Table 1. Demographics of participants surveyed regarding perceptions of emergency department (ED) clinical pharmacists (n = 122).

	n (%)
Gender	
Female	82 (67%)
Role in the ED?	
Adult consultant	10 (8%)
Adult specialist	24 (20%)
Pediatric consultant	3 (3%)
Pediatric specialist	4 (3%)
Adult nurse	71 (58%)
Pediatric nurse	10 (8%)
Years of experience in emergency medicine?	
Less than 1 year	5%
2–5 years	16%
6–10 year	31%
More than 10 years	48%
Years of experience in ED of KAUH	
Less than 1 year	11%
2–5 years	23%
6–10 year	40%
More than 10 years	26%
Years of experience working with clinical emergency pharmacist?	
Less than 1 year	52%
2–5 years	21%
6–10 year	16%
More than 10 years	11%

Results

Characteristics of study subjects

Of the 145 ED staff (providers and nurses) invited to participate in the survey, 122 (84%) responded (Table 1). All ED providers, 41 (100%), completed the survey, whereas 81 (78%) nurses did. Two-thirds of respondents (67%) were female. The roles of the ED participants were as follows: 34 adult providers, 7 pediatric providers, 71 adult nurses, and 10 pediatric nurses. Nearly half (48%) of participants had more than 10 years of experience in EM, and 66% had worked for more than 6 years in the ED of KAUH. Approximately half of the participants had less than 1 year of experience working with an EPh.

Main results (General perceptions, role of EPh, and specific EPh functions)

General perceptions. Three-fourths (76%) of respondents had consulted the EPh at least once (Table 2); the majority of these were nurses. Interestingly, about two-thirds (68%) of providers had not made any contact with the EPh at all. Roughly, half of all respondents (46%) thought that the most important factor for maximizing the EPh’s contribution to medication safety was through orders reviews, followed by the availability for consultations (28%); patient education was deemed the least important role, with 3%. When it comes to the types of orders that an EPh should review, 88% of nurses who responded thought that all orders should be reviewed, whereas providers were divided between all orders (39%) and high-risk medications (44%).

Table 2. Staff’s general perceptions of the emergency medicine pharmacist.

Survey questions	All (122)		Providers (41)		Nurses (81)	
	n	(%)	n	(%)	n	(%)
1 How many times in the last month in the ED have you consulted the pharmacist?						
Multiple times per shift	33	27%	1	2%	32	40%
At least once per shift	29	24%	3	7%	26	32%
More than once over five shifts but less than once per shift	20	16%	9	22%	11	14%
Not at all	40	33%	28	68%	12	15%
2 Which of the following do you think is most important in maximizing the pharmacist’s contribution to medication safety?						
Attend medical resuscitations	8	7%	3	7%	5	6%
Order review	56	46%	8	20%	48	59%
Being available for consult	34	28%	17	41%	17	21%
Staff education	20	16%	10	24%	10	12%
Patient education	4	3%	3	7%	1	1%
3 Which of the following types of orders should the pharmacist check before they are administered?						
All orders	87	71%	16	39%	71	88%
Non-urgent orders	6	5%	4	10%	2	2%
High-risk medications	25	20%	18	44%	7	9%
Rarely used medications	4	3%	3	7%	1	1%

ED: emergency department.

Table 3. Staff's responses to survey questions regarding the role of the emergency pharmacist.

Survey questions	Type of staff	Mean score*	Agree/strongly agree			Neutral			Disagree/strongly disagree		
			n	(%)	95% CI	n	(%)	95% CI	n	(%)	95% CI
1 The presence of a pharmacist improves quality of care in the emergency room	Providers (41)	1.93	33	80	68–93	7	17	6–29	1	2	0–7
	Nurses (81)	1.54	75	93	87–98	3	4	0–8	3	4	0–8
	All (122)	1.67	108	89	83–94	10	8	3–13	4	3	0–6
2 The pharmacist is an integral part of the ED team	Providers (41)	1.98	34	83	71–94	4	10	1–19	3	7	0–15
	Nurses (81)	1.69	71	88	80–95	7	9	3–15	3	4	0–8
	All (122)	1.79	105	86	80–92	11	9	4–14	6	5	1–9
3 I make more use of a pharmacist when they are located in the ED as opposed to when I have to call the pharmacy	Providers (41)	1.93	34	83	71–94	5	12	2–22	2	5	0–11
	Nurses (81)	1.68	72	89	82–96	4	5	0–10	5	6	1–11
	All (122)	1.76	106	87	81–93	9	7	3–12	7	6	2–10
4 It is helpful to me when the pharmacist checks medication orders before they are carried out	Providers (41)	1.98	32	78	65–91	8	20	7–32	1	2	0–7
	Nurses (81)	1.52	77	95	90–100	2	2	0–6	2	2	0–6
	All (122)	1.67	109	89	84–95	10	8	3–13	3	2	0–5
5 The presence of the pharmacist during medical resuscitations, conscious sedation, STEMI, acute stroke, enhances my ability to deliver safe and efficient care to patients	Providers (41)	2.02	32	78	65–91	5	12	2–22	4	10	1–19
	Nurses (81)	1.67	72	89	82–96	5	6	1–11	4	5	0–10
	All (122)	1.79	104	85	79–92	10	8	3–13	8	7	2–11
6 The pharmacist is a valuable patient educator	Providers (41)	1.66	38	93	85–101	2	5	0–11	1	2	0–7
	Nurses (81)	1.72	69	85	77–93	10	12	5–20	2	2	0–6
	All (122)	1.70	107	88	82–94	12	10	5–15	3	2	0–5
7 The pharmacist is a valuable teacher for ED staff	Providers (41)	2.05	32	78	65–91	8	20	7–32	1	2	0–7
	Nurses (81)	1.98	62	77	67–86	14	17	9–26	5	6	1–11
	All (122)	2	94	77	70–85	22	18	11–25	6	5	1–9
8 A mandatory review by the pharmacist of all routine orders (i.e. non-emergent) for patients less than 1 year old or less than 10kg would improve medication safety	Providers (41)	1.76	35	85	75–96	6	15	4–25	0	0	0–0
	Nurses (81)	1.54	76	94	89–99	3	4	0–8	2	2	0–6
	All (122)	1.61	111	91	86–96	9	7	3–12	2	2	0–4
9 Implementing a mandatory review of medication orders is desirable to me	Providers (41)	2.22	27	66	51–80	11	27	13–40	3	7	0–15
	Nurses (81)	1.63	76	94	89–99	4	5	0–10	1	1	0–4
	All (122)	1.83	103	84	78–91	15	12	6–18	4	3	0–6

ED: emergency department; CI: confidence interval.

*Mean score is calculated based upon the following scale: 1 = strongly agree; 2 = agree; 3 = neutral; 4 = disagree; 5 = strongly disagree.

Role of an Eph. The mean score for all questions was between strongly agree and agree (1.61–2), which reflects a positive attitude toward the Eph program (Table 3). Most respondents thought that the presence of an Eph in the ED improves quality of care (89%), and that an Eph is an integral part of the ED team (86%). Additionally, 87% of respondents thought that they would make more use of Ephs if they were located in the ED, as opposed to calling the pharmacy. Almost all respondent nurses (95%) found it helpful if an Eph checked the medication orders before they were carried out. Providers agreed with this, but to a lesser extent (78%). Both responding nurses (89%) and providers (78%) agreed that the presence of an Eph during medical resuscitations and critical

cases enhances their ability to deliver safe, quality care to patients. The vast majority of the respondents (88%) were in favor of the idea that an Eph is a valuable patient educator, and 77% see an Eph as a valuable teacher for ED staff. The vast majority of respondents (91%) agreed that a mandatory review by the Eph of all routine orders for patients less than 1-year-old or weighing less than 10kg would improve medication safety. Most respondent nurses (94%) were in favor of implementing a mandatory review of all medication orders by an Eph, whereas only 66% of providers agreed with the idea.

Specific Eph functions. The mean scores of this section were slightly higher than those in the previous section, ranging

Table 4. Staff's responses regarding specific emergency pharmacist functions.

Survey questions	Type of staff	Mean score*	Agree/strongly agree			Neutral			Disagree/strongly disagree		
			n	(%)	95% CI	n	(%)	95% CI	n	(%)	95% CI
1 Selection of the appropriate antibiotic	Providers (41)	2.24	29	71	57–85	5	12	2–22	7	17	6–29
	Nurses (81)	2.43	47	58	47–69	12	15	7–23	22	27	17–37
	All (122)	2.37	76	62	54–71	17	14	8–20	29	24	16–31
2 Selection of other medications (i.e. advice regarding which is most appropriate)	Providers (41)	2.27	27	66	51–80	12	29	15–43	2	5	0–11
	Nurses (81)	2.33	50	62	51–72	14	17	9–26	17	21	12–30
	All (122)	2.31	77	63	55–72	26	21	14–29	19	16	9–22
3 Consultation regarding medication use in pregnancy	Providers (41)	1.76	34	83	71–94	4	10	1–19	3	7	0–15
	Nurses (81)	2.10	55	68	58–78	19	23	14–33	7	9	3–15
	All (122)	1.98	89	73	65–81	23	19	12–26	10	8	3–13
4 Consultation regarding medication dosing	Providers (41)	2.05	33	80	68–93	6	15	4–25	2	5	0–11
	Nurses (81)	1.84	68	84	76–92	10	12	5–20	3	4	0–8
	All (122)	1.91	101	83	76–89	16	13	7–19	5	4	1–8
5 Consultation regarding toxicology	Providers (41)	2.00	31	76	62–89	7	17	6–29	3	7	0–15
	Nurses (81)	1.98	66	81	73–90	8	10	3–16	7	9	3–15
	All (122)	1.98	97	80	72–87	15	12	6–18	10	8	3–13
6 Consultation regarding drug–drug interactions	Providers (41)	1.73	34	83	71–94	5	12	2–22	2	5	0–11
	Nurses (81)	1.75	74	91	85–97	3	4	0–8	4	5	0–10
	All (122)	1.75	108	89	83–94	8	7	2–11	6	5	1–9
7 Consultation regarding review medication history and allergy	Providers (41)	2.10	30	73	60–87	7	17	6–29	4	10	1–19
	Nurses (81)	1.75	74	91	85–97	3	4	0–8	4	5	0–10
	All (122)	1.87	104	85	79–92	10	8	3–13	8	7	2–11

CI: confidence interval.

*Mean score is calculated based upon the following scale: 1 = strongly agree; 2 = agree; 3 = neutral; 4 = disagree; 5 = strongly disagree.

from 1.75 to 2.37 (Table 4); they remain on the positive side of agreement with the different specific EPh functions. Many providers (71%) see an EPh's input as useful in the selection of appropriate antibiotics, whereas only about half of respondent nurses (58%) thought the same. Two-thirds (66%) of respondents thought that the EPh is useful for selecting other medications. Respondents were in favor of an EPh's useful role in consultations regarding medication use in pregnancy (73%), medication dosing (83%), toxicology (80%), drug–drug interactions (89%), and when reviewing medication history and allergies (85%).

Discussion

This is the first study in Saudi Arabia that sheds light on an EPh program. It was led by the first Saudi clinical pharmacist, who completed a specialized pharmacy residency training in EM. The results of this study revealed a positive attitude among ED providers and nurses toward EPh services. It also shows that ED staff value the presence of an EPh as an integral part of the ED team. The implementation of the EPh program in our ED was not difficult to establish, due to the administration's flexibility and the hospital's supportive leadership. There remain, however, a couple of obstacles that might challenge the sustainability of such a program; some important ones are the limited number of

qualified emergency clinical pharmacists and their availability, due to other academic duties.

In general, our results were similar to what has previously been reported in the literature.^{7–9} Fairbanks et al.⁷ survey showed that ED physicians and nurses are overwhelmingly in favor of the presence of an EPh in the ED, frequently seek their advice, and think that an EPh improves the quality of care. A survey by Coralic et al.⁸ has also proven that the EPh model of practice provides valuable perceived benefit to ED providers. A more recent survey, by Splawski et al.,⁹ reported that an EM pharmacist is an invaluable addition to a health-care team.

One of the interesting findings of the present survey is that 68% of the ED providers had not made any contact with the EPh at all. This was not similar to any of the surveys by Fairbanks, Coralic, or Splawski. This revealed a significant underutilization of such an important service, especially when most ED providers recognized its value. The announcement of the EPh service was communicated to ED staff multiple times, using different modalities on different occasions, however; the limited hours that the EPh spends per week (20 h), in addition to the nature of the ED working hours (8-h shifts), could have played a role in limiting exposure for some providers. This was not an issue on the nursing side. Our findings support that the working hours for the EPh services

should be extended further to include weekends, evenings, and nights as much as possible, so that all ED staff can take advantage of their presence in the ED and provide a higher quality care.

This study supports the physical presence of the EPh in the ED and its valuable impact on patient care. For instance, the ED staff's response shows that the presence of the EPh is useful in medical resuscitation, critical cases, and ED staff and patient education. The ED providers and nurses confirmed that the implementation of an EPh program requires the pharmacist to be located in the ED, which will increase their utilization, as they are less likely to reach out for help from pharmacists by phone.

Our descriptive survey study is limited by the fact that we had only one EPh running the program, and that he has limited working hours that prevent the coverage during evenings, nights, and weekends. We had a 16% no response rate from nurses, but this would not change the current results. As is the case with other survey studies, this survey is subject to participants' recall bias. Despite the fact that this study is the first in Saudi Arabia and the region that looks at ED staff perceptions of an EPh, its setting and operations are different from other EDs, so we cannot generalize our findings to other EDs.

In conclusion, this survey study showed that the presence of an EPh in the ED is of invaluable benefit to the ED staff (physicians and nurses). It showed that ED staff members believe that EPhs are an essential part of the ED team, and that their presence aids in maximizing medication safety, the education of both ED staff and patients, and improving the quality of care delivered to the ED population. More measures should be taken to improve providers' utilization of the EPh.

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