Current Trends in Hospital Pharmacy Practice in Lebanon

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Abstract

Objectives: For decades, the role of hospital pharmacists has been instrumental in elevating pharmacy practice worldwide. Recently, the Hospital Pharmacy Section of the International Pharmaceutical Federation (FIP), the European Association of Hospital Pharmacists (EAHP) and the American Society of Health-System Pharmacists (ASHP) updated their statements about the future role and responsibilities of the pharmacy executive in hospitals and health systems. A series of surveys were conducted around the globe to better understand the current state of hospital pharmacy practice. The purpose of these surveys was to identify challenges in hospital pharmacy practice and to develop improvement strategies. The objective of this national survey is to evaluate hospital pharmacy practice in Lebanon.

Methods: A cross-sectional observational study was performed among pharmacists working in hospital settings in Lebanon, from January through June 2016. Based on a literature review, a questionnaire to elicit Lebanese hospital pharmacists' practice was developed.

Results: The results showed a non-significant difference between university teaching and non-university teaching hospitals in the processes of drug procurement, preparation, dispensing and drug administration. However, statistically significant differences were observed between university teaching and non-university teaching hospitals with respect to having clinical pharmacists ($p<0.001$) and highly qualified personnel ($p<0.005$). Pharmacy services in teaching hospitals seemed to be more advanced cooperating with affiliated medical schools. Furthermore, teaching hospitals were more likely to have pharmacists providing information about the safety of the medications used ($p=0.029$). Although not statistically significant, there was a higher trend towards having a designated champion for medication safety ($p=0.052$).

Conclusion: The results of our survey showed that teaching hospitals were more compliant with the International Statements of Hospital Pharmacy Practice compared to non-teaching hospitals. There is room for improvement especially if the application of the accreditation standards for safe hospital pharmacy practice becomes mandatory for all hospitals which is expected to standardize pharmacy practice and secure both medication and patient safety.

Keywords: teaching-hospitals; non-teaching hospitals, pharmacy practice; medications, patient safety; Lebanon.

Introduction

Lebanon is a small middle-income country with an estimated 6 million inhabitants located in the Middle East. In 2012, The World Health Organization Statistics report, confirmed that the number of hospital beds in Lebanon equaled 3.5 per 1000 inhabitants. In 2014, the total health care expenditure accounted for 6.4% of the national gross domestic products [1]. The Ministry of Public Health contracted a total of 163 hospitals [2] and employed 339 hospital pharmacists (out of 10000 pharmacists who were registered at the Lebanese Order of Pharmacists and licensed to practice). For decades, the role of hospital pharmacists has been instrumental in elevating pharmacy practice worldwide [3]. In 2015, the Hospital Pharmacy Section of the International Pharmaceutical Federation (FIP) released its newest Basel Statements describing the future of hospital pharmacy practice[4]. The European Association of Hospital Pharmacists (EAHP) used the Basel Statements when developing its hospital pharmacy practice statements. In 2016, the American Society of Health-System Pharmacists (ASHP) updated its statement about the role and responsibilities of the pharmacy executive, also known as the chief pharmacy officer, in hospitals and health systems. The pharmacy executive's responsibilities include, but are not limited to: strategic planning, optimizing medication management and advancing pharmacy practice, advancing the application of information technology in the medication management system and improvement, quality outcomes, drug utilization management, supply chain management, financial management, managing the pharmacy workforce, regulatory and accreditation compliance, research and educational missions, institutional representation and leadership [5].

A series of surveys were conducted around the globe to better understand the current state of hospital pharmacy practice, identify key issues facing it, and design improvement strategies. Furthermore, the findings from the aforementioned surveys were partially or entirely adopted in some countries to leverage the political infrastructure to support hospital pharmacy practice. ASHP and EAHP [6] published broad surveys of institutional pharmacy practice. However, the applicability of those statements was limited to hospital pharmacy practice in specific regions of the world. In light of the international guidance and emphasis on the developing role of hospital pharmacists, data on hospital pharmacy practice in Lebanon is needed to benchmark against

international practices. The objective of this national survey is to evaluate hospital pharmacy practice in Lebanon.

Methods

Study Type and Sampling

We conducted a cross-sectional observational questionnaire-based survey performed among pharmacists working in hospital settings in Lebanon, from January through June 2016. Based on the most recent Order of Pharmacists in Lebanon (OPL) list for hospital pharmacists, the participants were selected according to a proportionate random sampling of hospital pharmacies across the five different Lebanese districts: Beirut, Beqaa, Mount Lebanon, North and South Lebanon.

Data Collection Tool

Based on a literature review [7-9], a questionnaire to elicit Lebanese hospital pharmacists' practice was developed. This questionnaire included 45 questions categorized in 7 sections relevant to the current scope of pharmacy practice in Lebanon: 1) socio-demographic characteristics of the participants and hospital characteristics, 2) Pharmacy staff workforce including qualifications, 3) Pharmacy Services including responsibilities and jurisdictions, 4) Budget Planning, 5) Quality Management, 6) Interprofessional Relationship of the Pharmacist with other hospital department/services/committees and 7) Informatics and technology used in the pharmacy. (Appendix A) The questionnaire was developed in English then translated into French using a forward–backward translation process for validation. Pilot-testing was conducted before dissemination, to ensure validity and clarity of all the questions.

Data Collection

A team of OPL employees approached pharmacists working in the randomly selected hospitals and distributed multiple surveys per hospital. They explained the study objectives and highlighted the voluntary participation and confidentiality of the collected data. Once oral consent was received with willingness to participate, the self-administered questionnaire was handed to participants and then collected back upon completion. The time required to fill the survey was about 15 minutes.

Statistical Analysis

Descriptive statistics were used to calculate all participants' responses. Continuous variables were described using mean and standard deviation. Categorical variables were described using

frequencies. Analyses were performed using SPSS software, version 23.0 (IBM Corp., Armonk, NY, USA) and a p-value less than 0.05 was deemed statistically significant.

Ethical Considerations

Considering the observational nature of the study, it was considered exempt from the IRB review by the Lebanese University Review board since it was anonymous and respected participant's confidentiality.

Results

Hospital Characteristics

The characteristics of the hospitals are summarized in Table 1. The majority of non-teaching hospitals were located in Mount Lebanon (48.2%), whereas half of the teaching hospitals were found in Beirut. Around 50% and 68.2% of the non-teaching and teaching hospitals had 100-199 beds respectively. Moreover, 30.6% and 54.5% of the non-teaching and teaching hospitals had 6-10 ICU beds respectively. An Oncology Unit was reported to exist in more than 43% of the non-teaching hospitals and in 90.9% of teaching hospitals.

Hospital Pharmacy Working Schedule

A significantly higher percentage of teaching hospitals had "on-call" assistants and clinical pharmacists compared to non-teaching hospitals ($p<0.05$; Table 2)

Pharmacists' Degrees and Hospitals' Affiliations

A significantly higher percentage of teaching hospitals had a chief pharmacist with MBA degree (33.3% vs 4.7%), oncology pharmacists with MPH degree (19% vs 1.2%), assistant pharmacists with Pharm.D degree (42.9% vs 14.1%), clinical pharmacists with Pharm.D degree (33.3% vs 3.5%), MPH degree (9.5% vs 0%), or MBA degree (23.8% vs 1.2%) respectively. In addition, a significantly higher percentage of teaching hospitals had an affiliation with a school of pharmacy (86.4% vs 32.5%), a school of medicine (86.4% vs 43.4%) or a school of nursing (86.4% vs 57.8%) compared to non-teaching hospitals (Table 3).

Pharmacy Services

A significantly higher percentage of teaching hospitals reported to have pharmacists responsible for providing drug information for medication use (93.8% vs 63.9%), monitoring formulary compliance (100% vs 70.5%), and supervising the patient counseling service (72.2% vs 47.6%). Finally, a significantly higher percentage of teaching hospitals had both pharmacy undergraduate and PharmD. Students' training programs as compared to non-teaching hospitals (Table 4).

Discussion

In this study, we found that teaching hospitals had significantly more personnel with additional qualifications, particularly in the fields of clinical pharmacy and pharmacy management (chief pharmacists mainly) than non-teaching hospitals. Furthermore, pharmacy services in teaching hospitals seemed to be more progressive and affiliated with health care schools. However, due to the limited number of hospital beds in non-teaching hospitals, the number of pharmacists may be justified especially in the absence of Pharmacy laws that sets the minimum number of pharmacist to patient ratio.

Despite the availability of national hospital accreditation standards that apply for all kinds of hospitals, there is no existing data published on the compliance with these standards or the current scope of hospital pharmacy in Lebanon. Furthermore, there are no local guidelines in Lebanon issued by the Republic of Lebanon Ministry of Public Health or by the OPL [10] for hospital pharmacy practice. According to expert opinion, hospital pharmacy practice in Lebanon is primarily centered on the operational management of medication acquisition and distribution [11]. Guidance on the minimum requirements for hospital pharmacy are only provided by international bodies including the ASHP and FIP Basel statements [12]. The overarching goals of hospital pharmacy by both the ASHP and the FIP advocate for optimizing patient outcomes via pharmacy services through the appropriate use of medications. Although the application of these guidelines in Lebanon is not mandatory, they seem to be applied better in teaching hospitals than in non-teaching ones.

Moreover, transcending geographical locations and the defined scope of hospital pharmacy within individual countries, common goals include engaging pharmacists in preventing medication errors in prescribing, dispensing and in administration in order to improve patient safety[13]. As evident by the results of the survey, teaching hospitals were more likely to have pharmacists providing information on safe medication use and although not statistically significant, there was a higher trend towards having a designated champion for medication safety. On the other hand, data showed non significant differences between teaching and non-teaching hospitals in the processes of drug procurement, preparation and delivery; in addition to drug administration.

Recently, important roles for hospital pharmacy include, but are not limited to, pharmaceutical waste minimization, information technology and informatics [4]. The FIP Basel statements provide both minimum and aspirational requirements to account for the difference amongst many countries; however, they do not provide prioritization for tackling these statements [14]. We recommend these statements to be adapted to the Lebanese setting, and applied in Lebanese hospitals to optimize patient outcomes.

Moreover, the majority of teaching hospitals were affiliated with schools of pharmacy. Such affiliations have been identified as a factor positively associated with the advancement of pharmacy practice models [11, 13, 15]. In our study, a considerably higher number of teaching hospitals were affiliated with Schools of Pharmacy, Nursing and or Medicine. We expect these multidisciplinary affiliations to improve practice of several healthcare professions in Lebanon, pharmacy in particular.

As reflected by the survey, the current scope of practice of hospital pharmacists in Lebanon in comparison to the elements of service suggested by ASHP [12], includes drug procurement and inventory of medication and sterile supplies, medication use policy development, optimizing medication therapy, influences on prescribing, monitoring of medication use and evaluating the medication use system. Furthermore, the current scope of practice also includes pharmaceutical waste management, which was recently added by the FIP to the Basel Statements[4]. In fact, the complexity in pharmacy practice in health care settings has been documented in the literature since the early millennium. This complexity has been attributed to the numerous and increasing drugs on the market, demand for pharmacy service expansion, increased expectations for quality, technology and automation, frequent drug shortages as well as challenges in maintaining cost effectiveness for health care systems [16]. Furthermore, in 2008, the ASHP and ASHP Research and Education Foundation introduced the Pharmacy Practice Model Initiative (PPMI) as a call towards change in the way pharmacists practice in health systems. This call targeted pharmacy practice leaders with the goal of developing and disseminating a futuristic practice model that supports pharmacists as direct patient care providers in diverse health care settings [17]. Given the diversity in cadres for hospital pharmacist practice, it is important for pharmacists working in health care settings to have received adequate education and training within the scope of the pharmacy services provided [18]. In this study, more pharmacists with advanced degrees or

training were found in teaching hospitals. Therefore, we recommend that non-teaching hospitals increase the variety of recruited pharmacists' specialties to accommodate for the pharmacist contemporary role.

The current survey also showed a considerable influence of hospital pharmacists on physician prescribing practices, as reflected by pharmacists being members of the Pharmacy and Therapeutics (P&T) committee, responsible for formulary compliance, management and updates. Furthermore, reflected within the scope of services was also the involvement in antimicrobial stewardship, pharmacotherapy and pharmacokinetic consults. According to the Basel statements, the presence of a formulary, P&T committee, involvement in policy development and the involvement of pharmacists on patient care rounds and receipt of pharmacotherapy consults all reflect pharmacy services' influences on prescribing [4].

However, despite the fact that increasing the number of pharmacists in direct patient care improves patient outcomes [19], the availability of clinical pharmacy services in hospitals across Lebanon is still limited. Pharmacists participating in patient care rounds was reported to be less than 50% of hospitals, even though clinical pharmacists were available. This is comparable to some international reports, where 91% of hospitals reported having clinical pharmacy services, but only 28% of the hospitals reported that their pharmacists regularly attended patient care rounds [20]. Our results are also comparable to data from Saudi Arabia, where only 26% of 46 governmental and private hospitals reported that hospital pharmacists attended patient care rounds [21].

Based on the survey results, some reported services were indicative of partial clinical pharmacy practice such as the pharmacotherapy consults and medication counseling. In addition, as shown in the results, hospital pharmacists in Lebanon are involved in quality management and interprofessional committees such as antimicrobial stewardship. The role of the hospital pharmacist in quality improvement programs and the evaluation of the effectiveness of the medication use system is supported by both the FIP and the ASHP. Engaging in quality improvement activities and organizational committees pertaining to the medication use, selection, prescription, procurement, storage, preparation, dispensing, distribution, administration and monitoring, in collaboration with other health care professionals is recommended in order to ensure safe medication use processes [12, 22]. Further research initiatives regarding hospital

pharmacy, utilizing the FIP Basel statements and other international standards are needed in order to benchmark to published international studies.

Conclusion

In conclusion, the study showed high compatibility of hospital pharmacy practice in Lebanon with international hospital pharmacy practice statements. Both teaching and non-teaching hospitals had similar practices at the level of drug procurement, preparation and administration, however, teaching hospitals had significantly better influences on medication prescription and monitoring and had a more established clinical pharmacy practice in terms of number and qualifications of clinical pharmacists and approach in securing patient safety. The Ministry of Public Health in Lebanon, in collaboration with the OPL, should set standardized requirements for hospital pharmacy practice including the minimum qualifications for educational training and years of experience, role of the hospital pharmacist in the medication use process and number of pharmacists needed in each setting to secure medication safety and improve patients' outcomes. The law in addition to hospital accreditation will standardize and optimize hospital pharmacy services across the country.

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Tables

Table 1 – Characteristics of hospitals where pharmacists were recruited

Variables	Non-Teaching Hospitals	Teaching Hospitals
	(N= 85)	**(N=22)**
Districts		
Beirut	9(10.6%)	11(50%)
Mount Lebanon	41(48.2%)	7(31.8%)
North	3(3.5%)	-
South	14(16.5%)	2(9.1%)
Bekaa	15(17.6%)	2(9.1%)
Nabatieh	3(3.5%)	-
Types		
Public	71(83.5%)	1(4.5%)
Private	14(16.5%)	21(95.5%)
Number of Beds		
1-99 beds	45(52.9%)	-
100-199 beds	40(47.1%)	15(68.2%)
200-299 beds	-	6(27.3%)
>300 beds	-	1(4.5%)
Number of ICU Beds		
1-5 beds	19(22.4%)	-
6-10 beds	26(30.6%)	12(54.5%)
11-20 beds	47(25.8%)	8(36.4%)
>20 beds	-	2(9.1%)
Specialized Units		
Oncology Unit	34(43.6%)	20(90.9%)
Transplantation Unit	1(1.3%)	6(27.3%)
Burn Unit	1(1.2%)	2(9.1%)
Psychiatry Unit	1(1.3%)	3(13.6%)
Geriatric Unit	6(7.7%)	2(0.1%)

Table 2: Hospital Pharmacists' Working Schedule

Variables	Non-Teaching Hospitals	Teaching Hospitals (N=22)	Total (N=107)	p-value

	(N=85)			
24-hours Service				
No	68 (80%)	16 (72.7%)	84	0.318
Yes	17 (20%)	6 (27.3%)	23	
Night Shift				
No	82 (96.5%)	20 (90.9%)	102	0.272
Yes	3 (3.5%)	2 (9.1%)	5	
"On-call" Services				
"On-call" Chief Pharmacist	64 (75.3%)	20 (90.9%)	84	0.107
"On-call" Assistant Pharmacist	33 (38.8%)	14 (63.6%)	47	0.036
"On-call" Clinical Pharmacist	11 (12.9%)	14 (63.6%)	25	<0.001
"On-call" Pharmacy Technician	12 (14.1%)	7 (31.8%)	19	0.060

Table 3: Pharmacists Education and Training and Hospital Affiliations

Variables	Non-Teaching Hospitals	Teaching Hospitals	Total (N=107)	p-value

	(N=85)	(N=22)		
Pharmacist Education and Training				
Chief Pharmacists				
PharmD degree	32(37.6%)	12(57.1%)	44(41.5%)	0.139
Master Public Health	7(8.2%)	4(19%)	11(10.4%)	0.222
Master Business Administration	4(4.7%)	7(33.3%)	11(10.4%)	0.001
Post-graduate Certificate or Diploma	5(5.9%)	2(9.5%)	7(6.6%)	0.632
Oncology Pharmacists				
PharmD degree	4(4.7%)	0(0%)	4(3.8%)	0.582
Master Public Health	1(1.2%)	4(19%)	5(4.7%)	0.005
Assistant Pharmacists				
PharmD degree	12(14.1%)	9(42.9%)	21(19.8%)	0.006
Master Business Administration	1(1.2%)	1(4.8%)	2(1.9%)	0.358
Post-graduate Certificate or Diploma	0(0%)	1(4.8%)	1(0.9%)	0.198
Research Pharmacists				
PharmD degree	1(1.2%)	0(0%)	1(0.9%)	1
Master Business Administration	1(1.2%)	1(4.8%)	2(1.9%)	0.358
Clinical Pharmacists				
PharmD degree	3(3.5%)	7(33.3%)	10(9.4%)	<0.001
Master Public Health	0(0%)	2(9.5%)	2(1.9%)	0.038
Master Business Administration	1(1.2%)	5(23.8%)	6(5.7%)	0.001
Post-graduate Certificate or Diploma	2(2.4%)	0(0%)	2(1.9%)	1
School Affiliations				
School of Pharmacy	27(32.5%)	19(86.4%)	46(43.8%)	<0.001
School of Medicine	46(43.4%)	19(86.4%)	55(52.4%)	<0.001
School of Nursing	48(57.8%)	19(86.4%)	67(63.8%)	0.010

Table 4. Pharmacy Services provided by Hospital Pharmacists

Variable	Non-Teaching Hospitals (N=85)	Teaching Hospitals (N=22)	Total (N=107)	p-value
Procurement				

Procurement , selection and purchasing medications	68(81%)	20(90.1%)	88(83%)	0.221
Procurement , selection and purchasing medical supplies	49(58.3%)	8(36.4%)	57(53.8%)	0.055
Procurement , selection and purchasing diagnostic tests	14(16.7%)	3(13.6%)	17(16%)	0.511
Procurement , selection and purchasing medical gases	9(10.7%)	3(13.6%)	12(11.3%)	0.473
Procurement , selection and purchasing radiopharmaceutical products	28(33%)	5(22.7%)	33(31.3%)	0.246
Preparation and Delivery				
Medication dispensing	76(90.5%)	21(95.5%)	97(91.5%)	0.404
Compounding hazardous products	51(60.7%)	14(63.6%)	65(61.3%)	0.503
Compounding admixtures	40(47.6%)	10(45.5%)	50(47.2%)	0.524
Compounding total parenteral nutrition	34(40.5%)	11(50%)	46(42.5%)	0.473
Dispensing medical supplies	36(42.9%)	6(27.3%)	42(39.6%)	0.138
Administration				
Pharmacists provides adequate information for safe medication use	39(63.9%)	15(93.8%)	54(70.4%)	0.029
Designated quality champion for medication safety	51(67.1%)	19(90.5%)	70(72.2%)	0.052
Strategies and policies are implemented to prevent medication errors	47(61%)	14(63.6%)	61(61.6%)	1
Consultation on medication management	77(91.7%)	21(95.5%)	98(92.5%)	0.475
Influences on Prescribing				
Leadership role in formulary management and update	66(88%)	22(91.7%)	88(88.9%)	1
Pharmacy monitoring formulary compliance	43(70.5%)	19(100%)	62(77.5%)	0.005
Pharmacist is a member of the P&T committee	42(72.4%)	16(27.6%)	58(100%)	0.144
Antibiotic stewardship	73(86.9%)	19(86.4%)	92(86.8%)	0.593
Pharmacokinetic consult	60(71.4%)	17(77.3%)	77(72.6%)	0.399
Pharmacotherapy consult	63(75%)	19(86.4%)	82(77.4%)	0.201
Monitoring of Medication Practice				
Documentation in medical records	68(81.9%)	14(82.4%)	82(82%)	0.636
Patient counseling	40(47.6%)	16(72.2%)	56(52.8%)	0.030
Patient care rounds	31(36.9%)	8(36.4%)	39(36.8%)	0.585
Medication reconciliation upon admission, transfer of care and discharge	25(36.8%)	12(52.2%)	37(40.7%)	0.225
Human Resources and Training				
Pharmacy undergraduate training	30(35.7%)	18(85.7%)	48(45.7%)	<0.001
Pharm.D. student training	17(20.9%)	13(61.9%)	30(28.6%)	<0.001