CrossMark

RESEARCH ARTICLE

Qatar pharmacists' understanding, attitudes, practice and perceived barriers related to providing pharmaceutical care

Maguy Saffouh El Hajj[1] · Hassna Sohil AL-Saeed[2] · Maryam Khaja[3]

Abstract *Background* Pharmaceutical care (PC) is the philosophy of practice that includes identifying and resolving medication therapy problems to improve patient outcomes. *Objectives* The study objectives were to examine the extent of pharmaceutical care practice and the barriers to pharmaceutical care provision as perceived by Qatar pharmacists and to assess their level of understanding of pharmaceutical care and their attitudes about pharmaceutical care provision. *Setting* Qatar pharmacies. *Methods* A cross sectional survey of all pharmacists in Qatar was made. Consenting pharmacists were given the option to complete the survey either online using an online software or as paper by fax or by hand. *Main outcome measures* 1. Extent of pharmaceutical care practice in Qatar. 2. Barriers to pharmaceutical care provision in Qatar. 3. Qatar pharmacists' level of understanding of pharmaceutical care. 4. Qatar pharmacists' attitudes toward pharmaceutical care provision. *Results* Over 8 weeks, 274 surveys were collected (34 % response rate). More than 80 % of respondents had correct understanding of the aim of PC and of the pharmacist role in PC. However, only 47 % recognized the patient role in PC and only 35 % were aware of the differences between clinical pharmacy and PC. Yet, more than 80 % believed that they could be advocates when it comes to patients' medications and health matters. Concerning their practice, respondents reported spending little time on PC activities. Offering feedback to the physician about the patient progress was always or most of the time performed by 21 % of respondents. The top perceived barriers for PC provision included inconvenient access to patient medical information (78 %) and lack of staff and time (77 and 74 % respectively). *Conclusions* Although PC is not incorporated into pharmacy practice, Qatar pharmacists showed positive attitudes toward PC provision. Further work should focus on improving their PC understanding and on overcoming all barriers.

Keywords Pharmaceutical care · Pharmacist · Qatar

Impact of findings on practice

- To improve pharmaceutical care provision in Qatar, more opportunities should be in place to enhance the communication between pharmacists and physicians.
- Workshops should be designed to help Qatar pharmacists develop the skills that they need for pharmaceutical care delivery.
- Assisting Qatar pharmacists in understanding pharmaceutical care should precede any efforts to integrate pharmaceutical care into routine pharmacy practice in Qatar.

Introduction

According to Cipolle et al., pharmaceutical care (PC) is "the philosophy of practice that involves identifying resolving and preventing drug therapy problems (DTPs) for

✉ Maguy Saffouh El Hajj
  maguyh@qu.edu.qa

1 Chair of Clinical Pharmacy and Practice Section, College of Pharmacy, Qatar University, 2713 Doha, Qatar

2 National Center for Cancer Care and Research (NCCCR), Hamad Medical Corporation, Doha, Qatar

3 Sidra Medical and Research Center, 26999 Doha, Qatar

the purpose of achieving definite outcomes and improving the patient's quality of life". To resolve DTPs, pharmaceutical care practitioners should establish a therapeutic relationship with the patient and they need to create, evaluate and monitor a patient-specific care plan [1]. This philosophy entails a change in pharmacy practice from a product oriented one to a patient centered one.

Pharmaceutical care necessitates that pharmacists integrate the following activities in their practice including: patient assessment, patient counseling, setting therapeutic goals, documentation, and other activities [2].

Medication related morbidity and mortality result in huge costs which may exceed the costs of the medications themselves [3]. And adverse drug reactions are a major cause of hospital admissions and of increased hospital stay [4]. Over the last few years, many studies have demonstrated that the provision of PC services by pharmacists can improve the patients' clinical status and health care outcomes, and can entail cost savings [5–8].

In addition, this concept of practice has been endorsed by a number of pharmacy organizations including International Pharmacy Federation (FIP) and American Society of Health System Pharmacy (ASHP) [9, 10].

Since its introduction, PC practice has been embraced to various degrees and forms by pharmacy practitioners in different countries including: Australia, Canada, New Zealand, Thailand, United States (USA) and Europe [11–16].

Yet there are many barriers that were identified in the PC literature that would hinder the provision of PC in practice. In Canada, community pharmacists have started to follow the PC practice model and cognitive services have become more commonly provided. But there are many barriers to the provision of PC including: lack of time and funding, difficulty in communicating with patients' physicians and other barriers [14]. In china, pharmacists use the majority of their work time in medication dispensing and counseling. Their perceived barriers for PC implementation have included but not limited to lack of financial motivation, absence of support from other health care providers and lack of time [17]. AbuRuz et al. have reported that the provision of PC in Jordan is limited and that lack of PC training is a major barrier for PC implementation [18]. In Thailand, pharmacists do not spend much time on performing PC activities. Ngorsuraches and Li have found that lack of therapeutic knowledge and clinical problem solving skills, lack of data on the proven value of providing PC, and lack of time make PC provision in Thailand difficult [13].

Qatar is an Arab country occupying the small peninsula on the northeasterly shore of the Arabian peninsula. In 2015, Qatar's total population reached 2 million with the majority being expatriates [19]. There is only one College of Pharmacy and around 800 licensed pharmacists [20]. The majority of these pharmacists have obtained their pharmacy degree from outside Qatar. Dispensing of prescriptions is the primary duty of Qatar pharmacists and remains their core activity. Pharmacists dispense medicines at the order of a prescriber, typically a physician or a dentist. There are no regulations that require that a patient drug profile be maintained at the pharmacy. In addition there is no obligation at the time of dispensing to provide patients with instructions for use or counseling on any new prescription medications. Pharmacy practice in Qatar has been advancing gradually in the last few years to include the provision of cognitive services. Many factors have impelled this advancement including the launch of Doctor of Pharmacy degree (PharmD) at Qatar University College of Pharmacy (QU CPH) as well as various activities supporting the provision of PC such as integrating community pharmacy in Qatar National Health Strategy 2016 by Qatar Supreme Council of Health, [20, 21].

If PC is going to be implemented in Qatar it is imperative to identify and overcome all potential barriers. In addition, of particular importance is the need to nurture positive attitudes regarding PC among pharmacy practitioners in different practice settings.

To date, no information is available about the incorporation of PC into routine pharmacy practice in Qatar. In addition, barriers and attitudes to PC provision have not been studied among pharmacists in this country.

Aims of the study

The study objectives were to examine the extent of PC practice and the barriers to the provision of PC as perceived by Qatar pharmacists. In addition, the pharmacists' level of understanding of the basic concepts of PC and attitudes about PC provision were also assessed.

Ethical approval

The study was exempted from full ethics review by Qatar University Institutional Review Board (IRB): QU- IRB 53-E/11. This exemption includes the study survey. Completing the survey was voluntary and was considered consent for study participation.

Methods

Study design and participants

A cross-sectional survey of licensed pharmacists in Qatar was undertaken from April to June 2011. All licensed pharmacists practicing in Qatar (800 pharmacists at the time of conducting the study) including pharmacists

working in chain and independent community pharmacies, private and public hospitals and ambulatory clinics were eligible to participate [20].

Survey instrument

Founded on the pharmaceutical care model and previous surveys conducted in Canada, China, Denmark, Thailand, and New Zealand a self-completed questionnaire was designed in English to meet the study objectives [1, 13, 15, 17, 22, 23]. Although Arabic is the native language in Qatar, previous studies conducted in Qatar have demonstrated that English surveys can be effective tools to gather information from practicing pharmacists in this country [24].

The questionnaire was pretested among a sample of five randomly selected pharmacists in Qatar for comprehensibility, applicability, acceptability, and understanding (i.e.: face validity). Comments were also obtained from eight faculty members at QU CPH who tested the questionnaire content validity. Minor amendments were accordingly made to the final questionnaire.

The final structured questionnaire was comprised of five different sections that could be completed within 15–20 min (please find it as online supplementary material).

The questionnaire started with an introduction where the objectives of the study were stated and a thank you message was given to the pharmacists for their participation.

The first section of the questionnaire was designed to collect information on the sociodemographic and pharmacy practice characteristics of respondents (Table 1).

The second section captured information related to pharmacists' understanding of PC. It contained twelve true or false statements related to the pharmacists' understanding of the concept, aim and function of PC and to the pharmacists' role in the PC process. Five of which were false statements (Table 2).

In the third section, pharmacists were asked to rate the frequency of each of the fourteen listed PC activities as pertains to their pharmacy practice using 5 point Likert scale from "Never" to "All the time". These activities included drug therapy problem identification, drug therapy problem resolution, and other activities (Table 3).

In the fourth section the pharmacists were required to respond to twelve statements designed to assess their attitudes about the provision of PC using a 5-point Likert scale from 1 = strongly disagree to 5 = strongly agree (Table 4).

In the last section, pharmacists were asked to respond to what they perceived as barriers for PC provision. A 5-point Likert scale, from 1 = strongly disagree to 5 = strongly agree was used to collect the responses related to twenty-eight statements listing potential barriers to the provision of PC. (Table 5).

Survey implementation

With the help of QU CPH administration, we created a database of all practicing pharmacists in Qatar. This database included the contact information (phone, fax and email) of community pharmacists, hospitals pharmacists and ambulatory clinic pharmacists in Qatar. The list of pharmacists was taken from different resources including Qatar Supreme Council of Health, Primary Heath Corporation (PHC) and Hamad Medical Corporation (HMC). The list contained at the time of the study 800 practicing pharmacists in Qatar [20].

We initially contacted all pharmacists in the database to invite them to participate in the study. Pharmacists who orally consented could complete the survey either online, using an internet based commercial survey software, or as paper-based. Electronic mails (Emails), comprising the survey internet link, were sent to the participants who preferred to complete the survey online.

The paper-based survey was faxed or delivered by hand to the other participants at their pharmacy practice sites. Completed surveys were sent back to the principal investigator's office or the study investigators visited the pharmacists' practice sites for collecting them. All questionnaire copies were completed and returned anonymously. Two reminders were sent by email/fax/phone at 2-week interval to all pharmacists to complete the survey.

Data analysis

All analysis was made using Statistical Package of Social Sciences (SPSS®) Version 21. Incomplete responses were considered as missing values.

Frequencies, percentages, means and standard deviations were used to determine the respondents' sociodemographic and practice characteristics.

Frequencies and percentages were used to determine the pharmacists' understanding of and frequency of PC provision, their attitudes toward PC provision and their perceived barriers to PC provision.

The pharmacists' attitudes and perceived barriers were also reported as median scores and interquartile ranges. The pharmacists' years of experience in Qatar were classified into two groups: less than 10 years group and more than 10 years of experience in Qatar group.

The Kruskal–Wallis one-way analysis of variance test and the Mann–Whitney U test were used to compare the pharmacists' responses according to their pharmacy

Table 1 Respondent sociodemographic characteristics[a]

Characteristic	Frequency (%)
Age (N = 218) mean (SD)	34 (7)
Male gender (N = 237)	133 (56 %)
Country awarding highest pharmacy degree (N = 235)	
Egypt	87 (37 %)
Jordan	45 (19 %)
India	38 (16 %)
Sudan	25 (11 %)
Philippines	16 (7 %)
Others	24 (10 %)
Number of years since highest pharmacy degree (N = 236)	
<5	50 (21 %)
6–10	87 (37 %)
11–15	72 (31 %)
16–20	8 (3 %)
>20	19 (8 %)
Number of practice years in Qatar (N = 238)	
<5	98 (41 %)
5–9	83 (35 %)
10–14	38 (16 %)
15–20	9 (4 %)
>20	10 (4 %)
Highest degree awarded (N = 235)	
Bachelor degree	212 (90 %)
Master degree	18 (8 %)
PhD degree	3 (1 %)
PharmD degree	2 (1 %)
Previous practice[b] (N = 235)	
Egypt	60 (25 %)
India	28 (12 %)
Jordan	22 (9 %)
Sudan	21 (9 %)
Other ME countries	12 (5 %)
Other non-ME countries	15 (6 %)
More than one ME and East Asian/African countries	35 (15 %)
More than two non-ME countries	4 (2 %)
No previous practice	39 (17 %)
Pharmacy practice setting (N = 236)	
Independent community pharmacy	55 (23 %)
Chain community pharmacy	70 (30 %)
Public hospital pharmacy	60 (26 %)
Private hospital pharmacy	10 (5 %)
Public primary healthcare center pharmacy	34 (14 %)
Private primary healthcare center pharmacy	7 (3 %)
Pharmacist position (N = 236)	
Community pharmacist	83 (35 %)
Hospital dispensing pharmacist	40 (17 %)
Hospital clinical pharmacist	21 (9 %)

Table 1 continued

Characteristic	Frequency (%)
Primary healthcare center pharmacist	34 (14 %)
Pharmacy trainee	14 (6 %)
Pharmacy manager/owner/supervisor/director	44 (19 %)
Average number of working hours per week (N = 236)	
<20	8 (3 %)
20–39	35 (15 %)
40–59	167 (71 %)
60–79	21 (9 %)
>80	5 (2 %)
Average number of pharmacists in the pharmacy at any one shift (N = 220)	
Mean (SD)	3.2 (4)
Average number of pharmacy technicians in the pharmacy at any one shift (N = 211)	
Mean (SD)	2.34 (5.025)
Average number of prescriptions per day (N = 116)	
Mean (SD)	108 (25)

[a] Our study sample is representative of Qatar pharmacists. The majority of Qatar pharmacists obtained their pharmacy degree more than 5 years ago (84 %), are Bachelor of Pharmacy degree holders (86 %), are coming from Egypt, and Jordan (50 %), and had previous pharmacy practice before moving to Qatar (82 %), [24] The practice of outpatient pharmacists is divided as follows: 25 % as hospital pharmacists, 54 % as community pharmacists and 17 % working in Public primary healthcare center pharmacies [21]

[b] *ME* Middle Eastern

practice site and to their years of pharmacy experience in Qatar respectively.

To compare the pharmacists' responses that are related to their understanding and frequency of PC provision to their pharmacy practice site and to their years of experience in Qatar, we used Chi square test (χ^2 test). A *p* value of less than 0.05 was considered significant.

Because the pharmacists' attitudes toward PC and perceived barriers to providing PC were measured using multiple scales, reliability of these scales was assessed with Cronbach's alpha.

The Kaiser–Meyer–Olkin (KMO) measurement of sampling adequacy (it should be 0.7–1) and the Barlett's Test of Sphericity (*p* should be <0.05) were used to determine whether variables have enough common variance to be appropriate for factor analysis. Factor analysis was used to assess the dimensionality of the 28 items outlining the pharmacists' perceived barriers for PC provision. The number of factors selected for varimax rotation was determined using eigenvalue of more than 1 and factor loadings of more than 0.4.

Table 2 Pharmacists' understanding of pharmaceutical care

Statement	Pharmacy setting	n (%) correct answer	Significance level (2 sided)
Pharmaceutical care providers are directly responsible for the patient's health outcomes (n = 234)	Hospital pharmacy	59 (86 %)	0.904
	Community pharmacy	104 (84 %)	
	Ambulatory clinic pharmacy	36 (88 %)	
	Total	199 (85 %)	
The primary aim of pharmaceutical care is to improve and maintain the patient's quality of life (n = 231)	Hospital pharmacy	63 (95 %)	0.431
	Community pharmacy	113 (91 %)	
	Ambulatory clinic pharmacy	40 (98 %)	
	Total	216 (94 %)	
Pharmaceutical care is just a medication counseling service (n = 233)	Hospital pharmacy	51 (74 %)	0.000*
	Community pharmacy	62 (50 %)	
	Ambulatory clinic pharmacy	34 (85 %)	
	Total	147 (63 %)	
The term clinical pharmacy is interchangeable with pharmaceutical care (n = 234)	Hospital pharmacy	27 (39 %)	0.666
	Community pharmacy	42 (34 %)	
	Ambulatory clinic pharmacy	12 (29 %)	
	Total	81 (35 %)	
Pharmaceutical care is an extension of the current pharmacy services (n = 235)	Hospital pharmacy	10 (14 %)	0.003*
	Community pharmacy	19 (15 %)	
	Ambulatory clinic pharmacy	0 (0 %)	
	Total	29 (12 %)	
In pharmaceutical care the pharmacist identifies and manages a patient's existing and other potential drug therapy problems (n = 235)	Hospital pharmacy	63 (90 %)	0.552
	Community pharmacy	111 (90 %)	
	Ambulatory clinic pharmacy	39 (95 %)	
	Total	213 (91 %)	
Pharmaceutical care involves a defined process of activities, all steps of which must be completed in order to provide this service (n = 235)	Hospital pharmacy	61 (87 %)	0.653
	Community pharmacy	102 (82 %)	
	Ambulatory clinic pharmacy	35 (84 %)	
	Total	198 (84 %)	
All patients prescribed medicines require pharmaceutical care services (n = 235)	Hospital pharmacy	8 (11 %)	0.066
	Community pharmacy	29 (23 %)	
	Ambulatory clinic pharmacy	5 (12 %)	
	Total	42 (18 %)	
Pharmaceutical care requires availability of drug information resources (n = 235)	Hospital pharmacy	62 (89 %)	0.001*
	Community pharmacy	85 (69 %)	
	Ambulatory clinic pharmacy	37 (90 %)	
	Total	184 (78 %)	
To provide pharmaceutical care a consultation room or private area must be available (n = 235)	Hospital pharmacy	62 (89 %)	0.00*
	Community pharmacy	62 (50 %)	
	Ambulatory clinic pharmacy	39 (95 %)	
	Total	163 (69 %)	
Provision of pharmaceutical care offers a feedback mechanism that optimizes the use of medicinal products (n = 235)	Hospital pharmacy	63 (90 %)	0.017*
	Community pharmacy	98 (79 %)	
	Ambulatory clinic pharmacy	39 (95 %)	
	Total	200 (85 %)	
The patient's active involvement is optional in the provision of pharmaceutical care (n = 234)	Hospital pharmacy	29 (41 %)	0.00*
	Community pharmacy	74 (60 %)	
	Ambulatory clinic pharmacy	7 (17 %)	
	Total	110 (47 %)	

* Statistically Significant

Table 3 Frequency of offering pharmaceutical care

Statement	Pharmacy setting	n (%)					Significance level (2 sided)
		All the time	Most of the time	Never	Rarely	Sometimes	
Carefully assess the patient and obtain all information required if any intervention or recommendation has to be made	Hospital pharmacy	15 (22 %)	29 (42 %)	1 (1 %)	4 (6 %)	20 (29 %)	0.334
	Community pharmacy	12 (10 %)	55 (45 %)	1 (1 %)	15 (12 %)	39 (32 %)	
	Ambulatory clinic pharmacy	3 (7 %)	18 (45 %)	0 (0 %)	4 (10 %)	15 (38 %)	
	Total	30 (13 %)	102 (44 %)	2 (1 %)	23 (10 %)	74 (32 %)	
Identify patient-specific health or drug therapy related problem(s)	Hospital pharmacy	11 (16 %)	26 (38 %)	1 (1 %)	7 (10 %)	24 (35 %)	0.366
	Community pharmacy	14 (12 %)	47 (39 %)	0 (0 %)	8 (6 %)	52 (43 %)	
	Ambulatory clinic pharmacy	4 (10 %)	16 (41 %)	0 (0 %)	7 (18 %)	12 (31 %)	
	Total	29 (13 %)	89 (39 %)	1 (0 %)	22 (10 %)	88 (38 %)	
Identify available therapeutic alternatives and consider the pros and cons of each alternative with the patient	Hospital pharmacy	13 (19 %)	20 (30 %)	2 (3 %)	13 (19 %)	19 (29 %)	0.035*
	Community pharmacy	26 (21 %)	55 (45 %)	2 (2 %)	7 (6 %)	31 (26 %)	
	Ambulatory clinic pharmacy	2 (5 %)	14 (38 %)	1 (3 %)	7 (19 %)	13 (35 %)	
	Total	41 (18 %)	89 (40 %)	5 (2 %)	27 (12 %)	63 (28 %)	
Consider whether non-pharmacological therapy may help prevent or solve the health or therapy related problem(s)	Hospital pharmacy	4 (6 %)	13 (19 %)	4 (6 %)	15 (22 %)	32 (47 %)	0.00*
	Community pharmacy	29 (24 %)	45 (38 %)	0 (0 %)	5 (4 %)	41 (34 %)	
	Ambulatory clinic pharmacy	0 (0 %)	13 (33 %)	3 (7 %)	13 (33 %)	11 (27 %)	
	Total	33 (15 %)	71 (31 %)	7 (3 %)	33 (15 %)	84 (36 %)	
Explain to patients what they should expect from their medicine	Hospital pharmacy	16 (23 %)	23 (34 %)	2 (2 %)	5 (7 %)	23 (34 %)	0.531
	Community pharmacy	35 (29 %)	49 (40 %)	1 (1 %)	3 (2 %)	34 (28 %)	
	Ambulatory clinic pharmacy	11 (28 %)	18 (45 %)	0 (0 %)	2 (5 %)	9 (22 %)	
	Total	62 (27 %)	90 (39 %)	3 (1 %)	10 (4 %)	66 (29 %)	
Formulate a patient-specific action plan together with the patient, including identification of specific health outcomes and the means (drug or non-drug) to achieve them	Hospital pharmacy	5 (7 %)	11 (16 %)	15 (22 %)	11 (16 %)	27 (39 %)	0.002*
	Community pharmacy	19 (16 %)	29 (24 %)	4 (3 %)	27 (22 %)	42 (35 %)	
	Ambulatory clinic pharmacy	2 (5 %)	9 (24 %)	4 (10 %)	12 (32 %)	11 (29 %)	
	Total	26 (11 %)	49 (22 %)	23 (10 %)	50 (22 %)	80 (35 %)	
Take a holistic approach to patient care (i.e., consider the patient's medical, social, and financial needs in establishing the action plan)	Hospital pharmacy	4 (6 %)	19 (28 %)	13 (19 %)	10 (14 %)	23 (33 %)	0.000*
	Community pharmacy	24 (20 %)	39 (33 %)	1 (1 %)	21 (17 %)	35 (29 %)	
	Ambulatory clinic pharmacy	1 (3 %)	9 (24 %)	7 (18 %)	6 (16 %)	15 (39 %)	
	Total	29 (13 %)	67 (30 %)	21 (9 %)	37 (16 %)	73 (32 %)	
Consider patients' economic situation in the process of pharmaceutical care provision	Hospital pharmacy	9 (13 %)	18 (26 %)	7 (10 %)	12 (18 %)	22 (33 %)	0.00*
	Community pharmacy	46 (39 %)	40 (34 %)	3 (2 %)	5 (4 %)	25 (21 %)	
	Ambulatory clinic pharmacy	2 (6 %)	17 (47 %)	4 (11 %)	4 (11 %)	9 (25 %)	
	Total	57 (26 %)	75 (34 %)	14 (6 %)	21 (9 %)	56 (25 %)	

Table 3 continued

Statement	Pharmacy setting	n (%)						Significance level (2 sided)
		All the time	Most of the time	Never	Rarely	Sometimes		
Monitor the patient's adherence to the plan	Hospital pharmacy	8 (12 %)	10 (14 %)	15 (22 %)	13 (19 %)	23 (33 %)		0.00*
	Community pharmacy	12 (10 %)	19 (16 %)	3 (3 %)	35 (29 %)	51 (42 %)		
	Ambulatory clinic pharmacy	2 (5 %)	15 (40 %)	4 (11 %)	7(18 %)	10 (26 %)		
	Total	22 (10 %)	44 (19 %)	22 (10 %)	55 (24 %)	84 (37 %)		
Follow up on the patient's progress to assure the achievement of desired outcomes, making modifications to the existing plan if necessary	Hospital pharmacy	6 (9 %)	11 (16 %)	14 (20 %)	16 (23 %)	22 (32 %)		0.00*
	Community pharmacy	2 (2 %)	20 (17 %)	4 (3 %)	46 (38 %)	48 (40 %)		
	Ambulatory clinic pharmacy	1 (3 %)	13 (33 %)	7 (18 %)	5 (13 %)	13 (33 %)		
	Total	9 (4 %)	44 (19 %)	25 (11 %)	67 (29 %)	83 (37 %)		
Offer feedback to the patient's physician about his or her progress with the action plan and ultimately its outcome	Hospital pharmacy	4 (6 %)	14 (21 %)	20 (29 %)	11(16 %)	19 (28 %)		0.002*
	Community pharmacy	4 (3 %)	12 (10 %)	43 (36 %)	38 (31 %)	24 (20 %)		
	Ambulatory clinic pharmacy	1 (3 %)	12 (31 %)	5 (13 %)	6 (15 %)	15 (38 %)		
	Total	9 (4 %)	38 (17 %)	68 (30 %)	55 (24 %)	58 (25 %)		
Systematically document all processes involved in items as stated above	Hospital pharmacy	8 (12 %)	16 (24 %)	21 (32 %)	8 (12 %)	13 (20 %)		0.00*
	Community pharmacy	6 (5 %)	9 (7 %)	54 (45 %)	31 (26 %)	20 (17 %)		
	Ambulatory clinic pharmacy	3 (8 %)	13 (35 %)	8 (22 %)	5 (13 %)	8 (22 %)		
	Total	17 (8 %)	38 (17 %)	83 (37 %)	44 (20 %)	41 (18 %)		
Monitor adverse drug reactions and drug compliance among patients	Hospital pharmacy	8 (12 %)	22 (32 %)	7 (10 %)	14 (21 %)	17 (25 %)		0.005*
	Community pharmacy	6 (5 %)	15 (13 %)	20 (17 %)	39 (32 %)	40 (33 %)		
	Ambulatory clinic pharmacy	4 (10 %)	14 (36 %)	3 (8 %)	6 (15 %)	12 (31 %)		
	Total	18 (8 %)	51 (23 %)	30 (13 %)	59 (26 %)	69 (30 %)		
Engage in health screening activities, such as blood pressure measurement	Hospital pharmacy	2 (3 %)	12 (17 %)	23 (33 %)	11 (16 %)	21 (31 %)		0.239
	Community pharmacy	10 (8 %)	12 (10 %)	36 (30 %)	32 (26 %)	31 (26 %)		
	Ambulatory clinic pharmacy	1 (3 %)	8 (20 %)	10 (25 %)	7 (17 %)	14 (35 %)		
	Total	13 (5 %)	32 (14 %)	69 (30 %)	50 (22 %)	66 (29 %)		

* Statistically Significant

Table 4 Pharmacists current attitudes toward pharmaceutical care

Statement	Pharmacy setting	N (%) of Agreement	Median Score (IQR)[a]	Significance level (2 sided)
I see myself as my patient's advocate when it comes to his or her medicines and health-related matters in general (n = 230)	Hospital pharmacy	58 (84 %)	4 (4–5)	0.438
	Community pharmacy	111 (91 %)	4 (4–5)	
	Ambulatory clinic pharmacy	32 (82 %)	4 (4–5)	
	Total	201 (87 %)	4 (4–5)	
Ensuring that the patient's health outcomes are ultimately achieved is really the physician's role since he or she prescribes the drug therapy (n = 230)	Hospital pharmacy	19 (28 %)	2 (1–4)	0.233
	Community pharmacy	30 (25 %)	2 (2–3.25)	
	Ambulatory clinic pharmacy	15 (39 %)	2 (2–4)	
	Total	64 (28 %)	2 (2–4)	
I make the commitment and the effort required to improve my patients' health outcomes (n = 230)	Hospital pharmacy	68 (99 %)	5 (4–5)	0.000*
	Community pharmacy	98 (81 %)	4 (4–5)	
	Ambulatory clinic pharmacy	39 (98 %)	4 (4–5)	
	Total	205 (89 %)	4 (4–5)	
I do not think that it is practical to provide pharmaceutical care to patients in Qatar (n = 233)	Hospital pharmacy	11 (16 %)	2 (1–2)	0.171
	Community pharmacy	13 (11 %)	2 (1–2)	
	Ambulatory clinic pharmacy	5 (12 %)	2 (2–3)	
	Total	29 (13 %)	2 (1–2)	
I want to do more than what I am currently doing to improve the quality of life of my patients (n = 233)	Hospital pharmacy	65 (94 %)	5 (4–5)	0.00*
	Community pharmacy	98 (80 %)	4 (4–5)	
	Ambulatory clinic pharmacy	40 (98 %)	5 (4–5)	
	Total	203 (87 %)	4 (4–5)	
Providing pharmaceutical care to patients offers pharmacist job satisfaction (n = 232)	Hospital pharmacy	66 (96 %)	5 (4–5)	0.00*
	Community pharmacy	100 (81 %)	4 (4–5)	
	Ambulatory clinic pharmacy	39 (98 %)	5 (4.25–5)	
	Total	205 (88 %)	5 (4–5)	
I believe that preventing and solving health-related and drug therapy problems for patients are my responsibilities (n = 232)	Hospital pharmacy	64 (93 %)	5 (4–5)	0.00*
	Community pharmacy	106 (86 %)	4 (4–5)	
	Ambulatory clinic pharmacy	39 (98 %)	5 (4–5)	
	Total	209 (90 %)	5 (4–5)	
I am not comfortable with taking risks associated with assuming responsibility for the treatment outcomes of patients (n = 230)	Hospital pharmacy	14 (21 %)	2 (1.25–3)	0.012*
	Community pharmacy	39 (32 %)	3 (2–4)	
	Ambulatory clinic pharmacy	13 (33 %)	3 (2–4)	
	Total	66 (29 %)	2 (2–4)	
I do not think that my provision of pharmaceutical care would result in any significant benefit to patients (n = 231)	Hospital pharmacy	4 (6 %)	2 (1–2)	0.001*
	Community pharmacy	20 (16 %)	2 (1–3)	
	Ambulatory clinic pharmacy	1 (3 %)	2 (1–2)	
	Total	25 (11 %)	2 (1–2)	
The future success of pharmacy will depend on the provision of professional services in addition to dispensing (n = 231)	Hospital pharmacy	59 (87 %)	5 (4–5)	0.00*
	Community pharmacy	96 (79 %)	4 (4–5)	
	Ambulatory clinic pharmacy	41 (100 %)	5 (4–5)	
	Total	196 (85 %)	4 (4–5)	
Pharmaceutical care will increase the patient's appreciation of the pharmacist's value (n = 229)	Hospital pharmacy	67 (97 %)	5 (5–5)	0.000*
	Community pharmacy	99 (83 %)	4 (4–5)	
	Ambulatory clinic pharmacy	38 (95 %)	5 (4.25–5)	
	Total	204 (89 %)	5 (4–5)	

Table 4 continued

Statement	Pharmacy setting	N (%) of Agreement	Median Score (IQR)[a]	Significance level (2 sided)
There are no economic benefits to be gained from implementation of pharmaceutical care (n = 230)	Hospital pharmacy	14 (20 %)	2 (1–3)	0.852
	Community pharmacy	19 (16 %)	2 (1–3)	
	Ambulatory clinic pharmacy	9 (23 %)	2 (1–3)	
	Total	42 (18 %)	2 (1–3)	

* Statistically Significant

[a] A 5 point likert scale extending from 1 = strongly disagree 2 = disagree 3 = neutral 4 = agree 5 = strongly agree Cronbach's alpha = 0.732

Table 5 Perceived barriers for pharmaceutical care provision

Factor	Barrier	N (%) of agreement	Median score (IQR)[a]	Factor loading[b]
Lack of access to patient data	Inconvenient access to patient medical records	184 (77 %)	4 (4–5)	0.793
Lack of interaction with patients and health care providers	Insufficient opportunity for interaction with other health care providers	153 (65 %)	4 (3–4)	0.757
	Lack of opportunities for face-to-face encounters with patients	89 (38 %)	3 (2–4)	0.791
	Lack of patient demand and acceptance of pharmaceutical care	106 (45 %)	3 (2–4)	0.741
Lack of support from external partners	Other health care providers' resistance	125 (53 %)	4 (3–4)	0.631
	Lack of support from the owner or administration	114 (48 %)	3 (2–4)	0.584
Societal barriers	Cultural barriers	118 (50 %)	3.5 (2–4)	0.773
	Religious barriers	63 (27 %)	3 (2–4)	0.694
	Legal barriers	127 (54 %)	4 (2–4)	0.619
Lack of knowledge and skills	Lack of confidence in providing pharmaceutical care	77 (33 %)	2 (2–4)	0.557
	Lack of therapeutic knowledge and clinical problem solving skills	85 (37 %)	3 (2–4)	0.703
	Lack of effective communication skills	83 (35 %)	2 (2–4)	0.666
	Insufficient understanding of pharmaceutical care	110 (47 %)	3 (2–4)	0.833
	Inadequate training in pharmaceutical care practice	150 (64 %)	4 (3–4)	0.820
	Lack of documentation skills	132 (56 %)	4 (2–4)	0.716
Lack of initiatives	Pharmaceutical care entails too drastic a change in practice	91 (40 %)	3 (3–4)	0.441
	Lack of role models who provide pharmaceutical care	140 (59 %)	4 (3–4)	0.647
	Lack of data on the proven value of providing pharmaceutical care	118 (50 %)	4 (2–4)	0.731
	Lack of motivation	96 (54 %)	4 (2–4)	0.707
	Fear of change	87 (37 %)	3 (2–4)	0.650
	Lack of economic incentive (e.g., reimbursement) for providing pharmaceutical care	119 (51 %)	4 (2–4)	0.544
Lack of space and time	Insufficient physical space	156 (67 %)	4 (3–4)	0.864
	Lack of privacy in the pharmacy	171 (73 %)	4 (3–5)	0.821
	Lack of time	175 (74 %)	4 (3–5)	0.692
Lack of resources	Lack of funds needed to purchase the items required to provide pharmaceutical care	132 (52 %)	4 (3–4)	0.613
	Lack of drug information resources	105 (44 %)	3 (2–4)	0.705
	Insufficient staff	179 (77 %)	4 (4–5)	0.692
	Lack of computer equipment/software for keeping the patients' medical profiles	140 (61 %)	4 (3–5)	0.728

[a] A 5 point likert scale extending from 1 = strongly disagree 2 = disagree 3 = neutral 4 = agree 5 = strongly agree

[b] Cronbach's alpha = 0.870, The Kaiser–Meyer–Olkin measurement of sampling adequacy = 0. 790. The Barlett's Test of Sphericity = 2147 (d.f. = 378 p = 0.000)

Results

Two hundred and seventy-four surveys were collected during the 8-week survey collection period. This represents an approximate response rate of 32 % of all practicing pharmacists in Qatar. Nineteen surveys were found to contain no responses or duplicate survey attempts and were excluded. The remaining 255 surveys contained responses to one or more questions and were included in the analysis.

The pharmacists' sociodemographic and practice characteristics are summarized in Table 1. The majority of respondents were less than 40 years of age (83 %) and had been practicing for less than 10 years in Qatar (76 %). Most participants (83 %) had practiced in at least one other country before moving to Qatar. And 53 % practiced in a community pharmacy (chain or independent).

The majority of respondents (94 %) had an overall correct understanding of the PC aim. The roles and responsibilities of PC providers and the PC process were assessed using statements 1, 6 and 7, all of which were understood by over 80 % of pharmacists. Yet the patient role in the PC process, the difference between clinical pharmacy and PC and when to implement PC were not well recognized by the majority of respondents (more than 50 %). Community pharmacists had less understanding than pharmacists working in other practice sites of the differences between medication counseling and PC, of the resources needed for PC implementation and of the importance of offering feedback when providing PC (Table 2). Years of practice in Qatar did not significantly affect the pharmacists' understanding of PC except for the following statement "Pharmaceutical care is just a medication counseling service" where 81 % of pharmacists with more than 10 years of experience in Qatar answered correctly compared to 58 % of pharmacists with less than 10 years of experience ($p = 0.002$) and for the statement "Pharmaceutical care requires availability of drug information resources" with 91 % of pharmacists with more than 10 years of experience answering correctly versus 75 % in the less than 10 years experience group ($p = 0.009$).

Table 3 represents the pharmacists' reported extent of PC provision. The respondents did not devote enough time for performing PC activities. They carefully assessed the patients, identified their DTPs and explained to them what to expect from their medications more frequently than they monitored their adherence to the treatment plan or they followed up their progress to ensure the achievement of desired outcomes. They rarely or never offered feedback to the physician about the patients' progress or were engaged in any health screening activities. In addition, they seldom formulated a patient specific therapeutic action plan together with the patient. Ambulatory clinic pharmacists

reported more frequent monitoring of patient's adherence to treatment plan, following-up on the patient progress and systematic documentation of PC processes than other pharmacists. Again, the pharmacists' years of experience in Qatar did not significantly influence their PC provision except for considering non-pharmacological treatment to solve the patient's therapy problems, monitoring the patient's adherence to treatment plan, and offering feedback to the patient's physician about the patient' progress where more pharmacists with over than 10 years of experience in Qatar reported offering most of the time these services (33 vs. 30 % $p = 0.01$; 29 vs. 16 % $p = 0.028$; 26 vs.13 % $p = 0.0380$).

On the whole, the respondents had very positive attitudes toward PC provision (Table 4). The reliability of the attitudes scale was considered acceptable with a Cronbach's alpha of 0.732. The respondents believed that preventing and solving patients' health-related and DTPs are their responsibilities (90 %) and agreed that PC provision will increase the patient's appreciation of the pharmacist's value (89 %). The Kruskal–Wallis one-way analysis of variance test indicated that there are pharmacy practice site related differences in the pharmacists' general attitudes to PC. Community pharmacists expressed less positive attitudes toward the provision of PC. For example 80 % of community pharmacists agreed that they want to do more than what they are currently doing to improve the quality of life of their patients as compared to 94 % of hospital pharmacists and 98 % of ambulatory care pharmacists. Years of experience in Qatar did not significantly affect the pharmacists' attitudes toward PC except for two statements "I would like to provide pharmaceutical care but simply I do not know where or how to start" and "I am not comfortable with taking risks associated with assuming responsibility for the treatment outcomes of patients" with pharmacists who had been practicing in Qatar for more than 10 years expressed less positive attitudes compared to pharmacists with less experience [Median (IQR): 3 (2–4) vs. 4 (3–4) $p = 0.032$ and Median (IQR): 2 (2–3) vs. 3 (2–4) $p = 0.005$ respectively].

Table 5 lists the factors describing the pharmacists' perceived barriers for PC provision. The Kaiser–Meyer–Olkin measurement of sampling adequacy was 0. 790. The Barlett's Test of Sphericity was 2147 (d.f. = 378 $p = 0.000$) which indicates that the variables share common variance to be appropriate for factor analysis. The factor analysis yielded 8 factors which accounted for 66 % of the total variance. The first factor, lack of knowledge and skills, accounted for 13 % of the total variance. More than 50 % of respondents agreed that inadequate training in pharmaceutical care (64 %) and lack of documentation skills (56 %) are barriers to PC provision. The second

factor, lack of initiatives, accounted for 10 % of the total variance. Almost 60 % identified the lack of pharmaceutical care role models as a barrier for PC provision.

The third factor, lack of resources, accounted for 9 % of the total variance. More than 50 % of respondents agreed that insufficient staff (77 %) and lack of technology for keeping the patients' medical profiles (61 %) are barriers for PC provision.

The fourth factor, societal barriers, accounted for 9 % of the total variance. Legal barriers were indicated by 54 % of respondents.

The fifth factor, lack of space and time, accounted for 8 % of the total variance. More than 60 % of respondents considered lack of privacy (73 %), lack of time (74 %), and lack of space (67 %) as barriers for PC provision.

The sixth factor, lack of interaction with patients and health care providers, accounted for 7 % of the total variance with 65 % of respondents agreeing that insufficient opportunity for interaction with other health care providers is a barrier.

Discussion

The present study has found that respondents often identify patient-specific health or drug therapy related problems and explain to patients what to expect from their medications. However, they infrequently monitor the patients' adherence to their treatment plan or offer feedback to the physician about their progress. This is consistent with the results of a study in Jordan where only 33 % of pharmacists always or usually follow up on the patient's progress to assure the achievement of desired outcomes and 4 % always or usually offer feedback to the physician about the patient's progress with the care plan [18]. This is unfortunate as there is overall agreement in the pharmacy literature that monitoring of drug therapy by pharmacists can improve clinical outcomes and can reduce adverse drug reactions in several medical conditions such as asthma, diabetes, and hypertension [6, 25]. In addition, this finding indicates that the PC process in Qatar finishes after the pharmacist's initial encounter with the patient and that there is a communication gap between the pharmacist and the physician.

The higher frequency of monitoring patient's adherence to treatment plan, of following-up on the patient progress and of systematic documentation of PC processes by ambulatory clinic pharmacists compared to pharmacists in other practice settings in our study is explained by many factors including the latest accreditation of Qatar public ambulatory clinic pharmacies by the Accreditation Canada International and the recent implementation of several PC services in these clinics including pharmacist provided smoking cessation programs.

The current study has also indicated that Qatar pharmacists seldom formulate a patient specific action plan with the patient. In addition, they occasionally consider the patient's medical, social and financial needs when creating the action plan. To achieve the goals of PC, designing an outcomes-oriented pharmacotherapy plan is a must. In developing the plan, the pharmacist must include all elements that target each of the patient's medical conditions and must take into consideration the psycho-social characteristics of the disease as well as the cost of drug and non-drug treatment [1].

Another concern with Qatar pharmacists' reported PC services is the pharmacists' minimal involvement in health screening activities. This result is consistent with the results of previous studies conducted in Qatar that concluded that community pharmacists' involvement in breast cancer health promotion and in smoking cessation counseling is minimal [26, 27]. This may be caused by the inability of pharmacists to provide health screening services and/or by the lack of a pharmacy organization in Qatar that supports the pharmacists' provision of cognitive services. Actually 64 % of respondents reported inadequate training in PC as a barrier for PC provision. And 83 % received their highest pharmacy degree from one of these countries: Egypt, India, Sudan, and Jordan where schools of pharmacy follow pharmaceutical sciences based traditional undergraduate curricula that are not designed to produce pharmacists with enough knowledge and skills to provide optimal PC. Moreover, PC and clinical pharmacy residencies and fellowship training programs are not widely implemented in these countries.

In addition, the study results have indicated that the pharmacists' understanding of the PC process is not optimal. Their lack of recognition of the patient role in the PC process is alarming. PC is a patient-centered pharmacy practice that requires the pharmacist to work closely with the patient to promote health and to ensure the safety and effectiveness of drug therapy regimens. A key component in this process is the establishment of a professional relationship between the pharmacist and the patient that is based on care, collaboration, communication and shared decision making. The patient should understand and agree to all the elements in the plan. The patient's wants, needs and responsibilities are what drive the patient–pharmacist encounter [1]. In addition, only 35 % of pharmacists had proper understanding of the similarities and differences between clinical pharmacy and PC. Despite that these two concepts seem to have similar goals, these goals highlight different features of practice. Clinical pharmacy includes processes done by pharmacists without mentioning to any patient outcomes. In comparison, PC definition clearly includes outcomes. PC is frequently discussed as a system where pharmacists have to collaborate with other

healthcare providers. Clinical pharmacy definitions do not state anything in relation to systems. The foundation for clinical pharmacy is more in science than in relationship ethics in contrast to the foundation of PC which is more in relationship ethics than in science [28]. Assisting Qatar pharmacists in understanding PC should precede any efforts to integrate PC into routine pharmacy practice in Qatar. Qatar Supreme Council of Health in collaboration with QU CPH Continuing Professional Pharmacy Development Program (CPPD) should develop workshops targeted at improving the understanding of Qatar pharmacists of PC. These workshops should been designed to extend the pharmacists' clinical knowledge and to help them develop the skills that support the delivery of PC. They should include a didactic component in addition to role plays and clinical case studies.

The study has also demonstrated that despite PC practice is limited in Qatar, pharmacists have positive attitudes toward PC. These attitudes are better than those reported in other countries such as Thailand and New Zealand [13, 15]. A proactive attitude is desired from pharmacists if PC is to be incorporated into routine pharmacy practice in Qatar.

It is important to note that pharmacists who have more than 10 years of experience in Qatar had better understanding for two PC statements compared to pharmacists with less experience. They also had considered non-pharmacological treatment to solve the patient's therapy problems, had monitored the patient's adherence to treatment plan, and offered feedback to the patient's physician more frequently than pharmacists who have less experience. This may suggests that more experienced pharmacists are more comfortable interacting with patients and physicians in Qatar.

Interestingly, pharmacists with more experience have less positive attitudes towards two PC statements. This result is not surprising and is consistent with the results of previous studies done in Saudi Arabia and Nigeria [29, 30]. A probable explanation for our study finding is that pharmacists who have more experience may be hesitant to provide PC given all the inherent obstacles, that may hinder PC implementation, that they have seen in their years of practice in the country. These pharmacists have a greater tendency to acknowledge the difficulties entailed with starting a new service in Qatar. The most commonly reported barriers to PC provision were inconvenient access to patient medical records and insufficient staff (77 % of respondents). Similar results were also obtained in Jordan where 77 % of respondents indicated lack of access to patient medical records as a barrier to PC provision and in studies from New Zealand and in Thailand [13, 15, 18]. In Qatar, medical information is only currently accessible in hospitals and patient medical profiles are not readily available in Qatar community pharmacies and ambulatory

clinic pharmacies. In PC provision, pharmacists use their unique medication related knowledge and expertise to assess the patient's DTPs. To do this, they require access to patient medical and medication information. One of Qatar 2016 National Health Strategy goals is to build an effective and integrated national electronic-health system that permits involvement of all healthcare providers in Qatar [21]. This goal is not so far fully achieved as the information technology (IT) infrastructure is not yet implemented to transfer files and exchange medical information between different healthcare organizations.

More than 70 % of respondents agreed or strongly agreed that lack of time is a barrier for PC provision. This is consistent with the findings of similar studies in Australia, Argentina, China, New Zealand, Portugal and Thailand. With an average number of 108 dispensed prescriptions per day, the perceived lack of time barrier for PC provision is understandable. This will not allow the pharmacists enough time to practice PC [13, 15, 17, 31–33].

Insufficient opportunity for interaction with other health care providers was among the top most commonly perceived barriers. The PC concept does not undermine the responsibilities of other healthcare providers. Namely physicians and nurses have well recognized and important roles in the PC process. Strong cooperative relationships between the pharmacists and other healthcare providers are needed to design an appropriate care plan for patient's drug related problems and to optimize his or her therapeutic outcomes. This could be partially resolved by including Interprofessional education (IPE) activities in the undergraduate education of healthcare students in Qatar and the Middle East to help them appreciate the importance of team-based care and by implementing collaborative healthcare models that promote and encourage all healthcare professionals to work together as a team. These models require excellent interprofessional communication, mutual respect and understanding between the pharmacist and other providers.

Lack of privacy and lack of space were also highly reported as barriers (73 and 67 % of respondents respectively). Incorporation of a private or semi-private counseling area and of a patient waiting area in Qatar pharmacies would be helpful in easing pharmacist-patient encounter, enhancing the privacy of confidential discussions, and improving the counselling atmosphere.

Lack of financial remuneration was considered as a barrier by 51 % of participants. This is a very common barrier for PC implementation in many countries including Spain [34]. To encourage Qatar pharmacists to provide PC, payment for PC provision should be implemented. There should be understanding on the part of Qatar government and health insurance companies that PC services are both clinically and economically effective, and that there should

be an appropriate reimbursement system for pharmacist rendered PC services.

Limitations

The respondents showed very positive attitudes toward PC. This can be due to social desirability bias, that is, respondents gave positive answers so that they looked supportive of the researchers and PC. In addition, the survey response rate was low and no information was gathered regarding non-respondents. Therefore, it is plausible that pharmacists who filled the survey have better understanding of and attitudes toward PC than non-respondents. Nevertheless, if we compare the sociodemographic characteristics of our study respondents to those of Qatar Pharmacists, as published by Qatar Supreme Council of Health, we consider that our study participants represent the population of pharmacists in Qatar.

Conclusions

The study results have several implications for pharmacy practice in Qatar. They indicate that despite Qatar pharmacists are not implementing PC as part of their routine pharmacy practice, they have positive attitudes toward PC.

The study also highlights many obstacles that should be targeted to facilitate PC practice in Qatar. These obstacles include the suboptimal understanding of PC process of Qatar pharmacists in addition to several perceived barriers for PC provision such as inconvenient access to patient medical records, insufficient staff and lack of time. A joint cooperation between Qatar Supreme Council of Health, Qatar healthcare institutions, QU college of pharmacy and other healthcare educational institutions is highly required for the promotion of PC in this country.

Finally, the study also generates interest in future research directed at assessing the impact of pharmacist provided PC services on health outcomes in Qatar.

References

1. Cipolle R, Strand L, Morley P. Pharmaceutical care practice: the patient-centered approach to medication management. McGraw-Hill Medical; 2012. (ISBN-13: 978-0071756389).
2. Odedina FT, Segal R. Behavioral pharmaceutical care scale for measuring pharmacist's activities. Am J Health Syst Pharm. 1996;53:855–65.
3. Ernst F, Grizzle AJ. Drug-related morbidity and mortality: updating the cost-of-illness model. J Am Pharm Assoc. 2001;41(2):192–9.
4. Davies EC, Green CF, Taylor S, Williamson PR, Mottram DR, Pirmohamed M. Adverse drug reactions in hospital in-patients: a prospective analysis of 3695 patient-episodes. PLoS One. 2009;4(2):e4439.
5. Westerlund T, Marklund B. Assessment of the clinical and economic outcomes of pharmacy interventions in drug related problems. J Clin Pharm Ther. 2009;34:319–27.
6. Beney J, Bero LA, Bond C. Expanding the roles of outpatient pharmacists: effects on health services utilization, costs, and patient outcomes. Cochrane Database Syst Rev. 2000;3:CD000336.
7. Jokanovic N, Tan EC, van den Bosch D, Kirkpatrick CM, Dooley MJ, Bell JS. Clinical medication review in Australia: a systematic review. Res Social Adm Pharm. 2015. http://dx.doi.org/10.1016/j.sapharm.2015.06.007.
8. Tan EC, Stewart K, Elliott RA, George J. Pharmacist services provided in general practice clinics: a systematic review and meta-analysis. Res Social Adm Pharm. 2014;10(4):608–22.
9. International Pharmaceutical Federation. FIP statement of professional standards pharmaceutical care, 1998.
10. American Society of Health System Pharmacy. ASHP Statement on Pharmaceutical Care, 1993. [cited 1 July 2014]. Available at: http://www.ashp.org/DocLibrary/BestPractices/OrgStPharmCare.aspx.
11. Christensen DB, Farris KB. Pharmaceutical care in community pharmacies: practice and research in the US. Ann Pharmacother. 2006;40:1400–6.
12. Hughes CM, Hawwa AF, Scullin C, Anderson C, Bernsten CB, Bjornsdottir I, et al. Provision of pharmaceutical care by community pharmacists: a comparison across Europe. Pharm World Sci. 2010;32:472–87.
13. Ngorsuraches S, Li SC. Thai pharmacists' understanding, attitudes, and perceived barriers related to providing pharmaceutical care. Am J Health Syst Pharm. 2006;63(21):144–50.
14. Jones EJ, Mackinnon NJ, Tsuyuki RT. Pharmaceutical care in community pharmacies: practice and research in Canada. Ann Pharmacother. 2005;39(9):1527–33.
15. Dunlop JA, Shaw JP. Community pharmacists' perspectives on pharmaceutical care implementation in New Zealand. Pharm World Sci. 2002;24(6):224–30.
16. Wibowo Y, Berbatis C, Joyce A, Sunderland VB. Analysis of enhanced pharmacy services in rural community pharmacies in Western Australia. Rural Remote Health. 2010;10(3):1400.
17. Fang Y, Yang S, Feng B, Ni Y, Zhang K. Pharmacists' perception of pharmaceutical care in community pharmacy: a questionnaire survey in Northwest China. Health Soc Care Community. 2011;19(2):189–97.
18. Aburuz S, Al-Ghazawi M, Snyder A. Pharmaceutical care in a community-based practice setting in Jordan: where are we now with our attitudes and perceived barriers? Int J Pharm Pract. 2012;20(2):71–9.
19. The World Factbook, Qatar, 2015. [cited 13 Oct 2015]. https://www.cia.gov/library/publications/the-world-factbook/geos/qa.html.
20. Hamad Medical Corporation. Annual Health Report, 2012. [cited 1 July 2014]. http://site.hmc.org.qa/msrc/AHR2012/2012.html.
21. Qatar Supreme Council of Health. National Health Strategy 2011- 2016, 2014. [cited 1 July 2014]. http://www.nhsq.info/.
22. Rossing C, Hansen EH, Krass I. The provision of pharmaceutical care in Denmark: a cross-sectional survey. J Clin Pharm Ther. 2003;28:311–8.
23. Ramaswamy-Krishnarajan J, Hill DS. Pharmaceutical care in Canada: an exploratory study of 81 community pharmacies. Can Pharm J/Revue des Pharmaciens du Canada. 2005;138:46–50.

24. El Hajj M, Kheir N, Zaidan M, Jewesson P. Pharmacist characteristics, medication use perceptions, and professional satisfaction: a first national survey in the state of Qatar. J Healthc Leadersh. 2011;3:9–28.

25. Roughead L, Semple S, Vitry AI. Pharmaceutical care services: a systematic review of published studies, 1990–2003, examining effectiveness to improve patient outcomes. Int J Pharm Pract. 2005;13:53–70.

26. El Hajj MS, Hamid Y. Breast cancer health promotion in Qatar: a survey of community pharmacists' interests and needs. Int J Clin Pharm. 2011;33(1):70–9.

27. El Hajj MS, Al Nakeeb RR, Al-Qudah RA. Smoking cessation counseling in Qatar: community pharmacists' attitudes, role perceptions and practices. Int J Clin Pharm. 2012;34(4):667–76.

28. Hepler CD. Clinical pharmacy, pharmaceutical care, and the quality of drug therapy. Pharmacotherapy. 2004;24(11):1491–8.

29. Arifi MN, Al-Dhuwaili AA, Gubara OA, Al-Omar HA, Al-Sultan MS, Saeed RIM. Pharmacists' understanding and attitudes towards pharmaceutical care in Saudi Arabia. Saudi Pharm J. 2007;15(2):146–59.

30. Oparah AC, Eferakeya AE. Attitudes of Nigerian pharmacists towards pharmaceutical care. Pharm World Sci. 2005;27(3):208–14.

31. Berbatis CG, Sunderland VB, Joyce A, Bulsara M, Mills C. Enhanced pharmacy services, barriers and facilitators in Australia's community pharmacies: Australia's national pharmacy database project. Int J Pharm Pract. 2007;15(3):185–91.

32. Brazinha I, Fernandez-Llimos F. Barriers to the implementation of advanced clinical pharmacy services at Portuguese hospitals. Int J Clin Pharm. 2014;36(5):1031–8.

33. Uema SA, Vega EM, Armando PD, Fontana D. Barriers to pharmaceutical care in Argentina. Pharm World Sci. 2008;30(3):211–5.

34. Gastelurrutia MA, Faus MJ, Fernández-Llimós F. Providing patient care in community pharmacies in Spain. Ann Pharmacother. 2005;39(12):2105–10.