

# Pharmacy students' attitudes toward pharmaceutical care in Qatar

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**Objectives:** The study objectives were to investigate Qatar pharmacy students' attitudes toward pharmaceutical care (PC), to identify the factors that influence their attitudes, and to recognize their perceived barriers for PC provision.

**Methods:** A cross-sectional and online survey of Qatar pharmacy students was conducted.

**Results:** Over 4 weeks, 46 surveys were submitted (88% response rate). All respondents agreed that the pharmacist's primary responsibility is to prevent and resolve medication therapy problems. Most respondents believed that PC provision is professionally rewarding and that all pharmacists should provide PC (93% and 91% of respondents, respectively). Highly perceived barriers for PC provision included lack of access to patient information (76%), inadequate drug information sources (55%), and time constraints (53%). Professional year and practical experience duration were inversely significantly associated with four and five statements, respectively, out of the 13 Standard Pharmaceutical Care Attitudes Survey statements, including the statements related to the value of PC, and its benefit in improving patient health and pharmacy practitioners' careers.

**Conclusion:** Qatar pharmacy students had positive attitudes toward PC. Efforts should be exerted to overcome their perceived barriers.

**Keywords:** Qatar, pharmaceutical care, pharmacy, student

## Introduction

Recently, the focus of the pharmacy profession has shifted from medication supply to direct patient care. Pharmacists have been increasingly encouraged to broaden their role to include pharmaceutical care (PC) provision. PC is a multifactorial and structured process that is defined per Hepler and Strand as: "the responsible provision of drug therapy for the purpose of achieving outcomes that improve a patient's quality of life." It involves pharmacists working closely with patients and other health care professionals in three major functions: 1) detecting drug therapy problems, 2) resolving actual drug therapy problems, and 3) preventing potential drug therapy problems. Several studies have demonstrated that PC implementation improves patients' health outcomes and decreases health costs.<sup>2-5</sup> In response to the changing demands of the pharmacy profession, several professional pharmacy organizations internationally have adapted the philosophy of PC.<sup>6-8</sup> Yet, several barriers have hampered the implementation of PC practice universally, including: insufficient time to provide PC, lack of pharmacists' self-confidence, inadequate clinical knowledge, and communication skills of pharmacists. Furthermore, the negative attitudes of pharmacists themselves toward

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performing PC have served as barriers to providing PC.<sup>9–14</sup> In addition to addressing the time barrier, to fully implement the practice of PC, it is vital to prepare not only pharmacy practitioners of today but most notably the pharmacy practitioners of tomorrow. Many studies have described the role that pharmacy school educators should play in supporting the development of PC practitioners.<sup>15–20</sup> They should design educational strategies that foster the development of pharmacists who are eager to implement PC in their practice. They are charged with the task of ensuring that students have a deep understanding of the PC principles and practices.<sup>21</sup> In addition, they should instill in students good clinical knowledge, outstanding communication and problem solving skills, and self-confidence to take the responsibility for performing PC. What is challenging for pharmacy educators is to motivate pharmacy students to provide PC. By nurturing positive attitudes of students toward PC, pharmacy educators will be able to increase the provision of PC in practice.<sup>22</sup>

Qatar is a sovereign Arab state located in the Gulf Region of the Middle East. It has approximately 1.8 million residents (2010 estimate) and occupies around 11,000 km<sup>2</sup> of the northeasterly coast of the Arabian Peninsula.<sup>23</sup> The health system in Qatar is in a state of major reform and restructuring. The health care facilities in this country are predominantly governmental, offering their services to citizens and residents. These facilities are mainly operated by health care professionals who received their training and education outside Qatar.

In the pharmacy sector, there are around 800 pharmacists who are working in different pharmacy practice settings including hospitals, community pharmacies and clinics. Around 55% are male pharmacists, and more than 70% obtained their highest pharmacy degree from one of four countries: Egypt, Jordan, India, and Sudan.<sup>24,25</sup> With the exception of rare patient oriented cognitive services, pharmacy practice in Qatar focuses mainly on medication dispensing, and PC is still in its infancy.<sup>26</sup>

In an effort to support the training of local graduates and improve pharmacy practice, in 2007, the college of pharmacy was established at the only national institution in the country, Qatar University (QU).<sup>24</sup> QU College of Pharmacy is the first and only pharmacy degree program in the State of Qatar. It is accredited by Canadian Council on Accreditation of Pharmacy Programs. In addition to offering a 5-year Bachelor of Science in Pharmacy (BSc [Pharm]) degree program, in September 2011 the college started offering a Doctor of Pharmacy (PharmD) degree program and a Master of Sciences (MSc [Pharm]) degree program in

the pharmaceutical sciences. The college accepts in its first professional year between 20 and 25 undergraduate female students per year. Acceptance into the college is by a competitive application process. Applicants must finish at least 33 credit-hours of pre-pharmacy courses prior to entering the pharmacy program. In addition, they have to sit the Pharmacy College Admission Test. Qualified applicants then undergo a formal interview by the college admissions committee. In 2011, the college graduated the first students to receive pharmacy degrees in the State of Qatar.<sup>27</sup>

One of the college missions is to prepare pharmacy students to provide optimal PC and advance health care outcomes. According to the college curriculum, the concept of PC is introduced in the first professional year through pharmacy and health care and professional skills courses. In these courses, pharmacy students learn about the PC concept through didactic lectures. Starting with the second professional year, the concept of PC is integrated through simulated case scenarios in several courses, including pharmacotherapy and professional skills courses, and through structured practical experiences in pharmacy (SPEP) (ie, pharmacy clerkships). Some of these scenarios are accessed using patient medical record software by Cerner's Academic Education Solution® (Cerner, North Kansas City, MO, USA), which simulates virtual patients for the students to gain PC experience working with electronic medical records.

SPEP involves 24 weeks (960 hours) of structured pharmacy practice experience in a community, hospital, or clinic pharmacy practice setting. The first SPEP takes place during the summer semester of the second professional year and is comprised of 160 contact-hours (4 weeks) of clerkships. The second SPEP occurs during the summer semester of the third professional year and includes 160 contact-hours (4 weeks) of clerkships. The remaining SPEPs occur during the fall semester of the fourth professional year and are comprised of 640 contact-hours (4 × 4 weeks) of clerkships.<sup>27</sup>

There is a need to confirm whether the education and training that QU College of Pharmacy students are receiving are good enough to nurture positive attitudes toward PC.

In fact, nothing is known about the attitudes of pharmacy students to PC in Qatar and about the factors that influence their attitudes. In addition, information related to pharmacy students' perceived barriers for PC provision is lacking. Knowing this important information will assist in monitoring the progress in training future pharmacy practitioners in Qatar.

## Study aims

The study objectives were to investigate Qatar pharmacy students' attitudes toward PC, to identify the factors that influence their attitudes toward PC, and to recognize their perceived barriers for PC provision in Qatar.

## Methods

### Study design and participants

QU College of Pharmacy is the only pharmacy degree program in the country. The study objectives were addressed in a cross-sectional survey of pharmacy students at QU College of Pharmacy. Eligible participants were all QU second, third, and fourth professional (final) year pharmacy students (52 female students). First year pharmacy students were not exposed to the concept of PC at the time of survey administration, and as a result, this group of students was excluded.

### Assessment tool

A self-administered survey was used in the study. The study investigators designed the study survey based, in part, on the standard Pharmaceutical Care Attitudes Survey (PCAS). This survey tool is a validated instrument that measures students' attitudes toward PC. It was developed in the United States and has already been used and tested in previous studies in Nigeria, the Kingdom of Saudi Arabia, and the United States.<sup>19,28–31</sup>

The draft survey was distributed to eight faculty members at QU College of Pharmacy to assess its readability and content validity. It was also pretested among a group of four randomly selected pharmacy students at QU College of Pharmacy for clarity, relevance, acceptability, and time to completion (ie, face validity). These four students were excluded from the final study sample. Refinements were made as required in terms of language comprehension and question organization before distributing the final survey to the study population.

The final structured survey consisted of a total of 11 (closed- and open-ended) questions that could be completed within 10 minutes. It contained questions that addressed the pharmacy students' attitudes towards PC based on the PCAS survey, the students' sociodemographic characteristics, their perceived barriers toward PC provision, and their suggestions to improve their attitudes towards PC. Sociodemographic characteristics included age, country of origin, current professional year, marital status, and pharmacy training experience (Table 1).

To assess the students' attitudes towards PC, a five-point Likert scale (rating from 1= strongly disagree to

**Table 1** Respondent sociodemographic characteristics

Characteristic	Frequency (percentage)
Country of origin (N=46)	
Algeria	3 (7%)
Egypt	6 (13%)
Eritrea	1 (1%)
Iraq	5 (11%)
Jordan	6 (13%)
Libya	3 (7%)
Palestine	10 (22%)
Qatar	2 (4%)
Somalia	2 (4%)
Sudan	3 (7%)
Syria	3 (7%)
Yemen	2 (4%)
Current professional pharmacy year (N=46)	
Second	20 (44%)
Third	12 (26%)
Four	14 (30%)
Marital status (N=46)	
Unmarried	45 (98%)
Married	1 (2%)
Past training experience in a pharmacy environment including SPEP (N=46)	
Yes	28 (61%)
No	18 (39%)
In case of receiving training: training setting (N=28)	
Community pharmacy	5 (18%)
Hospital pharmacy	5 (18%)
Ambulatory clinic pharmacy	3 (11%)
Hospital pharmacy and community pharmacy	3 (11%)
Hospital pharmacy, community pharmacy, and ambulatory clinic pharmacy	12 (42%)

**Abbreviation:** SPEP, structured practical experience in pharmacy.

5= strongly agree) was utilized to measure the extent to which the students agreed with 13 statements related to PC (Tables 2 and 3). These statements were taken directly from the PCAS survey and measure three constructs: professional benefit (statements 4, 5, and 7–12), professional duty (statements 1–3), and return on effort (statements 6 and 13). Eleven of the 13 statements were positively worded, and two were negatively worded ("Time" and "Add Work"); the two negatively worded items, which relate to return on effort, were reverse scored during analysis so that the more positive attitudes toward PC would be reflected by higher scores.

The barriers that would prevent QU pharmacy students from providing PC in the future were identified by listing 12 possible barriers and by asking the students to indicate on a three-point Likert scale (high, medium, and low) the extent to which each of the listed barriers would impede their PC provision in the future. The barriers included: inadequate drug information resources, lack of access to the

**Table 2** Students' attitudes towards pharmaceutical care per PCAS item

Statement	Frequency (percentage)					Mean $\pm$ SD (95% CI)	Median (IQR)
	Please indicate your extent of agreement with the following statements regarding your attitudes towards pharmaceutical care						
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree		
1. All pharmacists should perform pharmaceutical care	24 (52%)	18 (39%)	4 (9%)	0 (0%)	0 (0%)	4.43 $\pm$ 0.65 (4.24–4.63)	5 (4–5)
2. Primary responsibility of pharmacists in health care setting should be to prevent and solve medication-related problems	29 (63%)	17 (37%)	0 (0%)	0 (0%)	0 (0%)	4.63 $\pm$ 0.49 (4.48–4.76)	5 (4–5)
3. Pharmacists' primary responsibility should be to practice pharmaceutical care	17 (37%)	18 (39%)	10 (22%)	0 (0%)	1 (2%)	4.11 $\pm$ 0.82 (3.87–4.33)	4 (3.75–5)
4. Pharmacy students can perform pharmaceutical care during their clerkship	15 (32%)	32 (50%)	4 (9%)	1 (2%)	3 (7%)	4.04 $\pm$ 0.94 (3.74–4.30)	4 (4–5)
5. I think the practice of pharmaceutical care is valuable	31 (67%)	15 (33%)	0 (0%)	0 (0%)	0 (0%)	4.67 $\pm$ 0.47 (4.52–4.80)	5 (4–5)
6. Providing pharmaceutical care takes too much time and effort <sup>a</sup>	10 (22%)	25 (54%)	9 (20%)	0 (0%)	2 (4%)	2.06 $\pm$ 0.77 (1.85–2.30)	2 (2–2.25)
7. I would like to perform pharmaceutical care as a pharmacist practitioner	26 (57%)	18 (39%)	2 (4%)	0 (0%)	0 (0%)	4.52 $\pm$ 0.59 (4.35–4.70)	5 (4–5)
8. Providing pharmaceutical care is professionally rewarding	26 (56%)	17 (37%)	3 (7%)	0 (0%)	0 (0%)	4.5 $\pm$ 0.62 (4.30–4.67)	5 (4–5)
9. I feel that the pharmaceutical care is the right direction for the provision to be headed	26 (56%)	16 (35%)	4 (9%)	0 (0%)	0 (0%)	4.48 $\pm$ 0.66 (4.28–4.67)	5 (4–5)
10. I feel that pharmaceutical care movement would benefit pharmacists	27 (59%)	17 (37%)	2 (4%)	0 (0%)	0 (0%)	4.54 $\pm$ 0.58 (4.37–4.72)	5 (4–5)
11. I feel that pharmaceutical care movement will improve patient health	32 (70%)	14 (30%)	0 (0%)	0 (0%)	0 (0%)	4.69 $\pm$ 0.46 (4.56–4.83)	5 (4–5)
12. I feel that practicing pharmaceutical care will benefit my professional pharmacy career as a pharmacy practitioner	30 (65%)	15 (33%)	1 (2%)	0 (0%)	0 (0%)	4.63 $\pm$ 0.53 (4.48–4.78)	5 (4–5)
13. Providing pharmaceutical care is not worth the additional workload that it places on the pharmacist <sup>a</sup>	2 (4%)	4 (9%)	6 (13%)	13 (28%)	21 (46%)	3.85 $\pm$ 1.07 (0.77–1.28)	4 (3–5)

**Note:** <sup>a</sup>Reversed score for negatively worded item.

**Abbreviations:** CI, confidence interval; IQR, interquartile range; PCAS, Pharmaceutical Care Attitudes Survey; SD standard deviation.

patient medical record in the pharmacy, lack of therapeutics knowledge, lack of understanding PC, inadequate training in PC, lack of workplace for counseling in the pharmacy, inadequate technology in the pharmacy, time constraints, and other barriers (Table 4).

The survey was started with the definition of “pharmaceutical care”: “Pharmaceutical care is a patient centered

practice in which the practitioner assumes responsibility for patients' drug-related needs and is held accountable for this commitment.”<sup>31</sup>

## Survey implementation and confidentiality

The survey was conducted using the Web-based commercially available survey software, SurveyMonkey® (SurveyMonkey, Palo Alto, CA, USA).<sup>32</sup>

Web-based surveys are efficient and convenient alternatives to the more traditional methods of data collection. They assure short timeframe for collection of responses and are time and cost saving. Furthermore, they permit anonymity, in addition to rapid and effective data analysis.<sup>33</sup>

An email, containing an Internet link to the survey, was sent to all eligible participants. The participants submitted

**Table 3** Students' attitudes towards pharmaceutical care per PCAS scale

Scale	Mean $\pm$ SD	Minimum score	Maximum score	Range
Professional duty	13.17 $\pm$ 1.65	10	15	5
Professional benefit	36.08 $\pm$ 3.68	28	40	12
Return on effort	5.91 $\pm$ 1.53	2	9	7

**Abbreviations:** PCAS, Pharmaceutical Care Attitudes Survey; SD standard deviation.

**Table 4** Students' perceived barriers for PC provision

Barrier	Frequency (percentage)		
	To what extent would each of the following barriers prevent you from providing PC when you become a pharmacist in the future?		
	High extent	Moderate extent	Low extent
Inadequate drug information resources in the pharmacy	25 (55%)	14 (30%)	7 (15%)
Lack of access to the patient medical record in the pharmacy	35 (76%)	11 (24%)	0 (0%)
Lack of therapeutics knowledge	18 (39%)	11 (24%)	17 (37%)
Lack of understanding of pharmaceutical care	17 (37%)	9 (20%)	20 (43%)
Inadequate training in pharmaceutical care	16 (35%)	14 (30%)	16 (35%)
Lack of workplace for counseling in the pharmacy	20 (44%)	19 (41%)	7 (15%)
Inadequate technology in the pharmacy	20 (43.5%)	20 (43.5%)	6 (13%)
Lack of self confidence	15 (33%)	12 (26%)	19 (41%)
Time constraints	24 (53%)	17 (38%)	4 (9%)
Poor image of pharmacist's role in society	23 (50%)	14 (30%)	9 (20%)
Inability to deal with a different gender	11 (24%)	6 (13%)	29 (63%)
Religious constraints	7 (15%)	3 (7%)	36 (78%)

**Abbreviation:** PC, pharmaceutical care.

the survey online. A reminder was sent via email to all eligible participants 2 weeks after the initial email was sent. After 4 weeks of data collection, the survey was closed, and the data were entered into the online survey software.

To minimize any potential for bias and to protect participant confidentiality, the survey was anonymously completed; no participant identification information was recorded by the investigators.

## Data analysis

Online survey data were downloaded to an Excel® (Microsoft Corporation, Redmond, WA, USA) spreadsheet, and imported into SPSS (IBM Corporation, Armonk, NY, USA) software, version 18, for descriptive and inferential analysis. Association of the sociodemographic characteristics of the respondents with their attitudes toward PC was determined using Spearman's rho test. Association was considered statistically significant when  $P$  was  $<0.05$ .

Incomplete surveys were included in the analysis if they contained basic demographic information and partial responses to some of the questions. Accordingly, the number of respondents for each question varied.

**Table 5** Statistically significant correlation between students characteristics and their attitudes toward pharmaceutical care<sup>a</sup>

	F (Spearman's rho)	P-values <0.05 (Spearman's rho)
Professional year versus "Primary responsibility of pharmacists in health care setting should be to prevent and solve medication-related problems"	-0.320	0.030
Professional year versus "I think the practice of pharmaceutical care is valuable"	-0.318	0.031
Professional year versus "I feel that pharmaceutical care movement will improve patient health"	-0.373	0.011
Professional year versus "I feel that practicing pharmaceutical care will benefit my professional pharmacy career as a pharmacy practitioner"	-0.299	0.044
Weeks of practical experience versus "Primary responsibility of pharmacists in health care setting should be to prevent and solve medication-related problems"	-0.416	0.005
Weeks of practical experience versus "Pharmacy students can perform pharmaceutical care during their clerkship"	-0.363	0.016
Weeks of practical experience versus "I think the practice of pharmaceutical care is valuable"	-0.412	0.005
Weeks of practical experience versus "I feel that pharmaceutical care movement will improve patient health"	-0.412	0.005
Weeks of practical experience versus "I feel that practicing pharmaceutical care will benefit my professional pharmacy career as a pharmacy practitioner"	-0.327	0.03

**Note:** <sup>a</sup>Only statistically significant correlations between student characteristics and their pharmaceutical care attitudes are included in this table.

The mean, standard deviation, median, interquartile range, and percentage frequency for each of the PCAS items was determined (Table 2). The mean, standard deviation, and range for the three separate constructs were determined (Table 3). The score for each scale of the PCAS was calculated by adding the five Likert scores (1–5) of the related items: professional benefit, items 4, 5, and 7–12; professional duty, items 1–3; return on effort, items 6 and 13. Scores above 3.5 were interpreted to be positive responses. The highest possible score for professional benefit was 40, and 8 was the lowest; the highest possible score for professional duty was 15, and 3 was the lowest; and the



highest possible score for return on effort was 10, and 2 was the lowest.

## Ethical considerations

Participation in the study did not pose any risk to participants and was voluntary. Pharmacy students who completed the survey were considered to have given the consent for participation in the study. The study procedures and instruments were exempted from full ethics review by the QU Institutional Review Board.

## Results

Over the 4-week study period, of the 52 students, 46 completed the survey (achieved overall response rate was 88%). Response rate was 100% for second-year students, 86% for third-year students, and 77% for fourth-year students.

## Students' sociodemographic characteristics

The sociodemographic characteristics of respondents are summarized in Table 1. Most respondents were coming from one of four countries: Palestine, Jordan, Egypt, and Iraq (59%). Respondents were aged between 19 and 24 years, with a mean age of 21 years  $\pm$  standard deviation of 1.33 years. The average number of weeks of training for respondents was 9 weeks  $\pm$  standard deviation of 6 weeks.

## Students' attitudes toward PC

QU pharmacy students' attitudes toward each PC item are presented in Table 2. Overall, the students had very positive attitudes toward PC provision. All respondents agreed that the primary responsibility of pharmacists in the health care setting should be to prevent and solve medication-related problems, that the practice of PC is valuable, and that the PC movement will improve patient health. However, 76% of respondents believed that providing PC takes too much time and effort.

The mean  $\pm$  standard deviation scores on the PCAS scales are summarized in Table 3. An assessment of influence of sociodemographic characteristics of the respondents on their attitudes toward PC is presented in Table 5.

Professional year and practical experience duration were inversely significantly associated with four and five statements, respectively, out of the 13 PCAS statements, including the statements related to the value of PC and its benefit in improving patient health and pharmacy practitioners' careers. No statistically significant correlations existed between other sociodemographic characteristics and students' attitudes toward PC.

## Students' perceived barriers for PC provision

Highly perceived barriers for PC provision included lack of access to the patients' medical records in the pharmacy (76% of respondents), inadequate drug information sources in the pharmacy (55%), time constraints (53%), and poor image of the pharmacist's role in society (50%) (Table 4).

When asked about the changes in pharmacy curriculum that should be made to further enhance their attitudes toward PC, most respondents suggested increasing the number of PC exercises in the professional skills course series (78% of respondents) and in the SPEP Program (74%).

## Discussion

This study is the first of its kind to assess the attitudes of Qatar pharmacy students toward PC. Overall, students in this study had high positive attitudes toward PC. There are other, but few studies describing pharmacy student attitudes toward PC. Both American and Saudi pharmacy students indicate favorable positive attitudes toward PC and agree that all pharmacists should perform PC.<sup>29,31</sup> Although our curriculum does not include a separate course on PC, this did not appear to be essential to nurture the students' positive attitudes.

Data in our study suggest that participants who have more practical experience have less positive attitudes toward PC. Professional pharmacy year is another contributing factor. Participants who are early in their professional years have higher positive attitudes toward PC. This is not unexpected for Qatar pharmacy students. It is plausible that those students who have completed more clerkships realize the possible mismatch between what is taught at QU College of Pharmacy and how pharmacists practice in Qatar. The pharmacy sites used for clinical clerkships are not yet offering PC services. As a result, our students are not able to observe the incorporation of PC into routine pharmacy practice.

One of the basic ways by which a new behavior is gained is through observation of other people's behavior and the outcomes for them.<sup>34</sup> Therefore, if pharmacy students are exposed to training in which the pharmacy practice is mostly passive, they are not likely to assume an active practice in which complete PC is provided. This highlights the need to have pharmacy experiential training sites that are designed to prepare Qatar pharmacy students for PC practice. These sites should offer the students the chance to see the integration of PC into pharmacy practice. The question comes up about how to change the current pharmacy training sites to actively promote PC. There are several ways to answer this question.

One way is to offer workshops to pharmacy preceptors to be role model pharmacists who can demonstrate and teach exemplary PC practice. These workshops can be prepared and delivered by the QU College of Pharmacy Continuing Pharmacy Professional Development program. These workshops should include a mix of knowledge and interactive skill development sessions with follow-up application at the preceptor practice site.

In addition to preceptor training, pharmacy students should be afforded the opportunity to provide PC directly to actual patients under observation of experienced preceptors as an integral portion of their training experience. The students should be engaged in the entire patient care process from initial assessment through documentation to follow-up evaluation. Students can then review their own performance with their pharmacy preceptors to determine their command of the PC concept. The major goals of these interactions are to help students develop patient assessment, care planning and evaluation skills, and to teach them the importance of developing an appreciation for the significant role they can play as pharmacists.

The top perceived barrier for PC provision is lack of access to patient medical records in the pharmacy. Difficulty in accessing patients' clinical and laboratory data has also been reported as a barrier for PC provision in community pharmacies worldwide.<sup>12,35</sup> PC is a multifaceted process that involves identifying, preventing, and resolving drug therapy problems. Associated with this process is the delivery of proper pharmaceutical services, which include obtaining patient history, evaluating laboratory data, and reviewing patient records.<sup>22</sup> In Qatar, patients' medical and medication information is only available in hospitals and health care clinics. This emphasizes the need for having patient medical records in Qatar pharmacies to provide an opportunity for developing a scope of PC.

Another of the students' perceived barriers for PC provision is the poor image of the pharmacist role in Qatar's society. Expanding scope of pharmacy practice in Qatar necessitates positive public attitudes and views. One survey of a small sample of the general population in Qatar found that "the public has a poor understanding of the pharmacist's role in regards to monitoring drug therapy, performing health screening, and providing drug information."<sup>36</sup> This is unfortunate, as many studies have demonstrated the effectiveness of pharmacist delivered PC services with regard to clinical, humanistic, and economic outcomes in different disease conditions.<sup>37-39</sup> More initiatives must be executed to educate Qatar's population about the importance of PC and

to promote the pharmacist's role through media campaigns and increased support from Qatar's Supreme Council of Health.

The students also identified lack of time as an impediment in the delivery of PC. This barrier has also been reported in previous studies among pharmacists in Argentina, China, Northern Ireland, and Qatar.<sup>13,14,35,40</sup> Markedly, with two or less pharmacists and less than one technician per pharmacy, and the high number of prescriptions dispensed, the perceived barrier of insufficient time to implement PC is reasonable and understandable. For Qatar pharmacists to implement PC practice, more pharmacy technicians need to be hired and better demarcation should exist between their role and that of pharmacists in this country. If Qatar pharmacists can be exempted to some extent from performing the routine dispensing tasks which can be delegated with supervision to trained pharmacy technicians, they can have more time and attention for cognitive services.

Another perceived barrier is inadequate drug information sources in the pharmacy. This is consistent with the results of a previous study conducted by one of the faculty members at QU College of Pharmacy about the characteristics of community pharmacies in Qatar. This study has confirmed that Qatar pharmacies have limited access to electronic resources and have a very small number of hardcopy drug information resources.<sup>41</sup> The implementation of PC in Qatar will necessitate supporting these pharmacies with all the needed tools that facilitate patient care, including drug information resources.

## Limitations

This study had some inherent limitations. Data presented here are a self-report of the students' attitudes to PC. In addition, despite our high response rate, our results of positive attitudes towards PC are from pharmacy students in Qatar and may not be shared by students from other pharmacy colleges in the Middle East that may follow a traditional pharmaceutical sciences-based curriculum.

## Conclusion

Qatar Pharmacy students have good attitudes toward PC. The top perceived barriers to PC provision are lack of access to patient medical records, inadequate drug information sources in the pharmacy, lack of time, and poor pharmacist image in society. Efforts should be exerted to overcome these perceived barriers, including better designing of pharmacy training sites to give pharmacy students the chance to observe the integration of PC into practice.

## Disclosure

The authors report no conflicts of interest in this work.

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