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Self-reported attitudes and perceived preparedness to provide pharmaceutical care among final year pharmacy students in Qatar and Kuwait

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Abstract

Purpose: While pharmaceutical care (PC) had been introduced and taught in schools of pharmacy decades ago, it is still being introduced with different degrees of success in many developing countries around the world. This study aimed to compare the attitudes, perceptions, preparedness, and perceived barriers towards providing PC to patients between final year pharmacy students at Qatar University's College of Pharmacy (QU-CPH) and Kuwait University's Faculty of Pharmacy (KU-FoP).

Methods: A pre-tested web-based questionnaire was simultaneously administered to final year pharmacy students in QU-CPH and KU-FoP (n=77) to assess their attitudes towards PC and their perceptions of their preparedness to the service. Students' opinions about PC education and the barriers to its implementation in practice were also assessed. Descriptive and inferential data analyses were performed using SPSS® version 22. A *p*-value ≤0.05 was considered statistically significant.

Results: The response rate was 81.8%. Most pharmacy students (88.7%) agreed that the PC curriculum at their school was sufficient to prepare them for future practice. Students at both universities expressed positive attitudes towards PC practice. They perceived their level of preparedness to practice PC to be higher in the technical, communication and psychosocial aspects as compared to the administrative aspects. Respondents rated the most important barrier to implementing PC practice to be lack of private counselling areas/inappropriate pharmacy layout in Kuwait (76.9%) and organisational barriers in Qatar (66.6%).

Conclusion: PC education provided at QU-CPH and KU-FoP appears to adequately prepare students for their future role. There are opportunities for curricular improvement including enhancing students' experiential training experience and inclusion of content related to administrative aspects of PC. Efforts should be geared towards overcoming the perceived barriers to PC to ensure broad implementation of PC practice in the Middle East region.

Keywords: *Survey, Pharmacy Students, Pharmaceutical Care, Kuwait, Qatar*

Introduction

Pharmaceutical care (PC) is a practice philosophy that advocates the responsible provision of medication therapy to achieve definite outcomes that improve the patient's quality of life (Hepler, 1990). To implement PC practice, the pharmacist collaborates with other healthcare providers and the patient in designing, implementing, and monitoring a therapeutic plan to identify, resolve, and prevent medication-related problems (American Society of Hospital Pharmacists, 1993; Martin-Calero *et al*., 2004). There has been sufficient evidence in the literature supporting the positive impact of PC on patients' clinical and humanistic outcomes in addition to reduction in healthcare costs (Hepler, 1990; Hepler & Strand, 1990; Berenguer *et al*., 2004; Martin-Calero *et al*., 2004). In an attempt to keep pace with the evolution in the scope of pharmacy practice, and in order to meet the needs of healthcare systems, many pharmacy schools have integrated PC education into their curricula to prepare pharmacy graduates with the necessary PC skills (Martin-Calero *et al*., 2004; Kheir *et al*., 2013).

Pharmacy academia has an obligation to prepare pharmacy graduates who have sufficient knowledge, skills (American Society of Hospital Pharmacists, 1993) as well as positive attitudes to practice PC (Chisholm & Wade, 1999). Furthermore, pharmacy students and practitioners need adequate education and training to

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prepare them to to provide comprehensive PC services to their patients (Schommer & Cable, 1996). However, unlike in many developing countries, where teaching and training of students on PC is still slow and inconsistent, Qatar and Kuwait have long integrated PC into the curricula of their schools of pharmacy (Kheir *et al*., 2013). Moreover, pharmacists practicing in Kuwait and in Qatar have been found to possess positive attitude towards PC, although the implementation of the practice is still suboptimal (El Hajj *et al*., 2016; Katoue *et al*., 2014b).

A national pharmacy degree programme was established at Qatar University's College of Pharmacy (QU-CPH) in 2007 (website: http://www.qu.edu.qa/pharmacy/). The College had since secured full accreditation from the Canadian Council on Accreditation of Pharmacy Programs (CCAPP) for both its Baccalaureate (B.Sc.) and Doctor of Pharmacy (Pharm.D.) degree programmes. The principles of PC and its evolution are introduced to first professional year students in QU-CPH, and from the second professional year onward, PC content features in several courses within the B.Sc. and Pharm.D. degree programmes. Teaching of PC takes place during the Professional Skills sessions and the Integrated Case-based Learning (ICBL) sessions in an environment that utilises small group and problem-based learning. The skills of developing care plans run as a thread along all professional years, and all assessments include an authentic, performance-based competency assessment in the form of Objective Structured Clinical Examinations (OSCEs). A structured Practical Experience in Pharmacy (SPEP) allows students to learn first-hand about PC and its application in practice. Under close supervision by their preceptors, students learn how to perform different aspects of PC, such as patient interviewing, data collection and analysis, identification of actual and potential drug-related problems, and developing care plans. Students complete two hospital, two community pharmacy, and one clinic practice rotation during the SPEP rotations. By the end of the six mandatory SPEP practice experiences, students complete 960 hours of experiential training prior to graduation. While Qatar is witnessing a growing application of the PC practice in the hospital sector, there are no structured PC services in the private sector including community pharmacy, apart from few individual initiatives made by some pharmacists (Kheir *et al*., 2013).

Kuwait University's Faculty of Pharmacy (KU-FoP) was established in 1996 (website: http://www.hsc.edu.kw/FOP/). The Faculty offers a Bachelor of Pharmacy (B.Pharm.) degree programme. Students learn about the philosophy and practice of PC in pharmacy practice courses spanning the professional years of the B.Pharm. programme. In the current pharmacy curriculum, students are introduced to the concept of PC and the basic PC principles in the second year of the curriculum. In the third through fourth years of study, students learn about the PC aspects related to management of various disease states in the pharmacy practice courses. This is achieved through large teaching which is reinforced with both dispensing laboratories and small group discussions on case studies. Students' assessment is based on written exams composed of multiple choice questions and short answer questions, as well as assessing their performance in practical examinations. During their fourth year of study, students undertake experiential training (clerkships) under preceptors' supervision in primary healthcare centres and community pharmacies. In their final year, students take an advanced PC course and undergo more extensive experiential training in general and specialised hospitals. During the experiential training experiences, students practice a range of PC skills. These include interviewing patients, retrieving patient data from medical files, and developing a patient specific PC plan to identify, resolve and prevent drug-therapy problems. The practice of PC is still in its early stages of development in Kuwait and relies heavily on individual efforts made by some motivated pharmacists (Kheir *et al*., 2013). In an earlier study about PC services in Kuwait hospitals, the pharmacists reported performing a number of PC activities.(Awad *et al*., 2006). In the community pharmacy setting, pharmacists have been providing a number of health services to the public (Katoue *et al*., 2012), but structured PC services are still lacking. In an attempt to enhance the scope of pharmacy profession in Kuwait, the Ministry of Health has been sponsoring educational scholarships for Kuwaiti pharmacists to attain a Master's degree in clinical pharmacy. In addition, KU-FoP has developed a two-year add-on Pharm.D. programme which is offered to the graduates of the B.Pharm. programme.

The attitude of pharmacy students towards PC has been investigated in studies conducted in developed countries such as the United States (US) (Chisholm & Martin, 1997) and France (Perraudin *et al*., 2011), as well as in some developing countries (Al-Arifi, 2009; El Hajj *et al*., 2014; Katoue *et al*., 2014a; Udeogaranya *et al*., 2009). There have been similar studies conducted in Qatar (El Hajj *et al*., 2014) and Kuwait (Katoue *et al*., 2014a) to assess pharmacy students' attitudes towards PC practice and their perceptions of the barriers to its implementation, but no previous studies have compared the attitudes and level of preparedness of graduates from two pharmacy curricula towards implementing PC practice. Therefore, the present study was designed to compare the self-reported attitudes towards PC, perceptions of preparedness to perform PC competencies, and opinions about the barriers to the provision of PC among final year pharmacy students in Qatar and Kuwait. The study also aimed to explore the students' perceptions regarding PC curricula content and their achieved learning and training about PC.

Methods

Study design

This was a cross-sectional descriptive study conducted through a web-based survey. Data were collected between October and December 2014.

Study subjects

Eligible participants were final year undergraduate pharmacy students at QU-CPH (all-female class) and final year undergraduate pharmacy students at KU-FoP (mixed gender class).

Survey instrument development

A self-administered online questionnaire was used for the data collection. The questionnaire was developed from original survey instruments including the Pharmaceutical Care Attitude Survey (PCAS) and the Perceptions of Preparedness to Provide Pharmaceutical Care (PREP) survey, both developed and validated in the US (Chisholm & Martin, 1997; Martin & Chisholm, 1999; Ried *et al.,* 2002; Scott *et al*., 2010). These two survey instruments have been used in an earlier study conducted among pharmacy students at KU-FOP (Katoue *et al*., 2014a). Thus, the version of the questionnaire that was validated previously among pharmacy students at KU-FoP was used as a basis for the questionnaire in this study (Katoue *et al*., 2014a). The questionnaire was reviewed by the research team and minor modifications were made as needed to simplify the wording of some items. Prior to its administration, the questionnaire was piloted on 15 recently graduated pharmacy students who provided feedback on its readability and comprehension.

The final version of the questionnaire consisted of 56 questions that were divided into five sections (A to E). Section A of the questionnaire included six items to gather the socio-demographic characteristics of the respondents and their preferred future practice settings. In Section B, respondents were asked to indicate their level of agreement on a 5-point Likert scale (1=strongly disagree, 5=strongly agree) on seven items that assessed students' perceptions about PC curricula content and education. In Section C, which consisted of the PCAS survey (Chisholm & Martin, 1997), students were asked to indicate their level of agreement on 13 items that explored their attitudes towards PC using a 5-point Likert scale (1=strongly disagree, 5=strongly agree). Section D consisted of a reduced version (25 items) of the PREP survey (Ried *et al*., 2002), in which the respondents were asked to rate their perceptions of preparedness to provide PC competencies using a 5-point Likert scale (1=poor, 5=excellent). In Section E, respondents were asked to list in order of importance, five pre-determined barriers to the provision of PC and to rate their significance as barriers using a 5-point rating scale (1=the least significant barrier, to 5=the most significant barrier).

Data collection

The survey was developed in SurveyMonkey® (a web-based commercially available survey software) and distributed via university emails to the final year pharmacy students in both schools of pharmacy on the same day. An internet link to the web-based questionnaire was sent to the university emails of eligible participants who were all final year pharmacy students at the two universities. A reminder was sent to the participants one week after the initial date of the survey distribution. A second reminder was sent two weeks following the first reminder. The survey was closed after two months from the initial date of distribution. Participation in the study was voluntary and the study participants completed the questionnaire online without indicating any identification information to guarantee the anonymity and confidentiality of the responses they provided.

Statistics

Responses to the survey were analysed using the Statistical Package for Social Sciences programme, version 22.0 (IBM SPSS Statistics for Windows, v.22; IBM Corp, USA). Both descriptive and inferential analyses were utilised. Age of study participants was presented as the mean (±SD), and categorical variables including students' responses to the survey items were presented as frequencies and percentages. *Chi*-square or Fisher's Exact test and Mann Whitney *U*-test were applied to compare the groups as appropriate. A *p*-value of ≤0.05 was considered statistically significant.

Ethical approval

Ethics approvals for the study were obtained from Qatar University Institutional Review Board (QU-IRB) and the Ethical Committee for the Protection of Human Subjects at the Health Sciences Centre, Kuwait University.

Results

Characteristics of the study participants

A total of 77 final year undergraduate pharmacy students were approached in both campuses. Of these, 63 students (21 from QU-CPH and 42 from KU-FoP) completed the questionnaire (overall response rate of 81.8%). The demographic characteristics of the respondents are summarised in Table I. The majority of the pharmacy students from both countries expressed preferences to work in the hospital setting in the future (57.1% for QU-CPH vs. 64.3% for KU-FoP).

Students' perceptions about pharmaceutical care curricula content and education

The perceptions of the final year pharmacy students towards PC education are presented in Table II. There were no statistically significant differences between the respondents from QU-CPH and KU-FoP in terms of their perceptions towards PC content in the curriculum. Approximately, 76% of the pharmacy students from both universities agreed that the PC content learned had provided them with sufficient confidence to provide PC to patients in their future practice. Around half of the respondents (47.5%) wished that they had more in-class teaching about PC. The majority of the students (88.7%)

reported that PC content in the curriculum was sufficient to prepare them for the delivery of effective PC services in their future practice. However, 9.5% of students from QU-CPH and 42.5% from KU-FoP (p=0.062) disagreed that the experiential training they had received was adequate to help them apply PC when they graduate.

Table I: Demographic characteristics of study participants and their comparison between the two campuses (n=63)

Demographic characteristics	Qatar University (n=21)	Kuwait University (n=42)	Total (n=63)	*p*-value
Age (Mean±SD)	22.81± 0.75	22.38± 1.10	22.60±0.93	0.114
Gender:				
Female	21 (100%)	39 (92.9%)	60 (95.2 %)	0.545
Male	0 (0.0%)	3 (7.1%)	3 (4.8 %)	
Nationality:				
Qatari	1 (4.8%)	1 (2.4%)	2 (3.2 %)	0.001
Kuwaiti	0 (0.0%)	35 (83.3%)	35 (55.6 %)	
Others	20 (95.2%)	6 (14.3%)	26 (41.3 %)	
Preferred future pharmacy setting:				0.344
Community	0 (0.0%)	2 (4.8%)	2 (3.2 %)	
Hospital	12 (57.1%)	27 (64.3%)	39 (61.9 %)	
Industry	1 (4.8%)	0 (0.0%)	1 (1.6 %)	
Academia	8 (38.1%)	13 (31.0%)	21 (33.3 %)	

Students' attitudes towards pharmaceutical care

Table III presents pharmacy students' attitudes towards PC. Generally, the students' reported positive attitudes towards the provision of PC. The majority of the students believed that providing PC is professionally rewarding (95.2%) and that they would like to perform PC as pharmacy practitioners (96.7%). Most students from both QU-CPH (76.1%) and KU-FoP (74.4.0%) disagreed on the negatively worded statement related to the additional workload needed for providing PC. Almost all respondents from both universities agreed on the beneficial effects of PC on the pharmacists' professional career and patient health outcomes.

Students' perceptions of preparedness to provide pharmaceutical care

Most of the respondents from the two universities indicated a very good to excellent level of preparedness to perform most of the technical aspects of PC. The least perceived preparedness in the technical aspects of PC was noted in calculating and evaluating drug pharmacokinetic properties (43.6% vs. 19.1% of the students reported very good–excellent preparedness level in KU-FoP and QU-CPH, respectively; p=0.322). In general, the students indicated the least preparedness level in the administrative aspects of PC.

Students' opinions about barriers to providing pharmaceutical care

Table IV illustrates the students' rating of five pre-determined barriers to PC provision. The respondents from KU-FoP (76.9%) rated the lack of private counselling areas as the most important barrier to PC

Table II: Pharmacy students' perceptions towards pharmaceutical care curricula content and achieved learning (n=63)

Item	Qatar University Frequency (%)*			Kuwait University Frequency (%)*			Total Frequency (%)*			*p*-value
	Disagree	Neutral	Agree	Disagree	Neutral	Agree	Disagree	Neutral	Agree	
The PC topics/content I have learned in the curriculum were useful during my experiential training[φ]	0 (0.00%)	0 (0.00%)	21 (100%)	1 (2.40%)	5 (12.20%)	35 (85.40%)	1 (1.60%)	5 (8.10%)	56 (90.3%)	0.317
The extent of PC content in the pharmacy curriculum is sufficient to prepare me for the delivery of effective PC upon graduation[φ]	0 (0.00%)	1 (4.80%)	20 (95.2%)	3 (7.30%)	3 (7.30%)	35 (85.30%)	3 (4.80%)	4 (6.50%)	55 (88.7%)	0.741
The PC content/topics I have taken have provided me with sufficient confidence to provide PC to my patient upon graduation[φ]	1 (4.80%)	4 (19.0%)	16 (76.1%)	4 (9.80%)	6 (14.6%)	31 (75.6%)	5 (8.10%)	10 (16.1%)	47 (75.8%)	0.221
I wish we had more in-class teaching on PC[φ]	9 (42.8%)	4 (19.0%)	8 (38.0%)	9 (22.5%)	10 (25.0%)	21 (52.5%)	18 (29.5%)	14 (23.0%)	29 (47.5%)	0.224
PC concepts are very clear in my mind[φ]	0 (0.00%)	5 (23.8%)	16 (76.2%)	3 (7.3%)	9 (22.0%)	29 (70.7%)	3 (4.8%)	14 (22.6%)	45 (72.5%)	0.412
Experiential training in health care settings during undergraduate studies was adequate to help me apply PC when I graduate[φ]	2 (9.5%)	3 (14.3%)	16 (76.2%)	17 (42.5%)	7 (17.5%)	16 (40.0%)	19 (31.1%)	10 (16.4%)	32 (52.5%)	0.062
My preceptor gave me sufficient opportunities during my experiential training to apply the PC concepts which I had learnt in class[φ]	4 (19.0%)	5 (23.8%)	12 (57.2%)	10 (24.4%)	11 (26.8%)	20 (48.8%)	14 (22.6%)	16 (25.8%)	32 (51.6%)	0.879

[φ]Some missing data
*Strongly Disagree and Disagree responses were collapsed into Disagree; Agree and Strongly Agree responses were collapsed into Agree

Table III: Pharmacy students' attitudes towards pharmaceutical care (n=63)

Item	Qatar University Frequency (%)*			Kuwait University Frequency (%)*			Total Frequency (%)*			*p*-value
	Disagree	Neutral	Agree	Disagree	Neutral	Agree	Disagree	Neutral	Agree	
All pharmacists should perform pharmaceutical care[φ]	0 (0.0%)	1 (4.8%)	20 (95.2%)	2 (5.0%)	3 (7.5%)	35 (87.5%)	2 (3.3%)	4 (6.6%)	55 (90.2%)	0.729
The primary responsibility of pharmacists in all health care settings should be to prevent and resolve medication-related problems[φ]	1 (4.8%)	1 (4.8%)	19 (90.5%)	1 (2.5%)	2 (5.0%)	37 (92.5%)	2 (3.3%)	3 (4.9%)	56 (91.8%)	0.923
Pharmacists' primary responsibility should be to practice pharmaceutical care[φ]	2 (9.6%)	2 (9.5%)	17 (81.0%)	2 (5.0%)	2 (5.0%)	36 (90.0%)	4 (6.5%)	4 (6.6%)	53 (86.9%)	0.429
Pharmacy students can perform pharmaceutical care during their experiential training (placements)[φ]	1 (4.8%)	5 (23.8%)	15 (71.4%)	5 (12.5%)	4 (10.0%)	31 (77.5%)	6 (9.8%)	9 (14.8%)	46 (75.4%)	0.362
I think the practice of pharmaceutical care is valuable[φ]	0 (0.0%)	1 (4.8%)	20 (95.3%)	0 (0.0%)	2 (5.0%)	38 (95.0%)	0 (0.0%)	3 (4.9%)	58 (95.1%)	0.222
Providing pharmaceutical care takes too much time and effort[φ]	6 (28.6%)	7 (33.3%)	8 (38.1%)	5 (12.9%)	8 (20.5%)	26 (66.6%)	11 (18.3%)	15 (25.0%)	34 (56.6%)	0.110
I would like to perform pharmaceutical care as a pharmacist practitioner[φ]	1 (4.8%)	0 (0.0%)	20 (95.3%)	1 (2.5%)	4 (10.0%)	35 (87.5%)	2 (3.3%)	4 (6.6%)	55 (90.1%)	0.099
Providing pharmaceutical care is professionally rewarding[φ]	1 (4.8%)	0 (0.0%)	20 (95.2%)	2 (5.0%)	4 (10.0%)	34 (85.0%)	3 (4.9%)	4 (6.6%)	54 (88.6%)	0.311
I feel that pharmaceutical care is the right direction for the profession to be headed[φ]	1 (4.8%)	1 (4.8%)	19 (90.5%)	1 (2.5%)	2 (5.0%)	37 (92.5%)	2 (3.2%)	3 (4.9%)	56 (91.8%)	0.334
I feel that the pharmaceutical care movement will benefit pharmacists[φ]	0 (0.0%)	1 (4.8%)	20 (95.2%)	0 (0.0%)	0 (0.0%)	40 (100%)	0 (0.0%)	1 (1.6%)	60 (98.4%)	0.004
I feel that the pharmaceutical care movement will improve patients' health[φ]	0 (0.0%)	0 (0.0%)	21 (100%)	0 (0.0%)	0 (0.0%)	39 (100%)	0 (0.0%)	0 (0.0%)	60 (100%)	0.033
I feel that practicing pharmaceutical care would benefit my professional career as a pharmacy practitioner[φ]	0 (0.0%)	1 (4.8%)	20 (95.2%)	1 (2.5%)	1 (2.5%)	38 (95.0%)	1 (1.6%)	2 (3.3%)	58 (95.1%)	0.118
Providing pharmaceutical care is not worth the additional workload that it places on the pharmacist[φ]	16 (76.1%)	4 (19.0%)	1 (4.8%)	29 (74.4%)	7 (17.9%)	3 (7.7%)	45 (75.0%)	11 (18.3%)	4 (6.7%)	0.777

φSome missing data
*Strongly Disagree and Disagree responses were collapsed into Disagree; Agree and Strongly Agree responses were collapsed into Agree

Table IV: Opinions about barriers to the provision of PC

	Qatar University (n = 21) Frequency (%)					Kuwait University (n = 42) Frequency (%)					Total (n = 63) Frequency (%)					*p*-value
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	
Lack of private counseling area[φ]	2 (9.5)	2 (9.5)	5 (23.8)	5 (23.8)	7 (33.3)	3 (7.7)	3 (7.7)	3 (7.7)	6 (15.4)	24 (61.5)	5 (8.3)	5 (8.3)	8 (13.3)	11 (18.3)	31 (51.7)	0.249
Lack of time[φ]	3 (14.3)	2 (9.5)	5 (23.8)	7 (33.3)	4 (19.0)	3 (7.7)	4 (10.3)	5 (12.8)	9 (23.1)	18 (46.2)	6 (10.0)	6 (10.0)	10 (16.7)	16 (26.7)	22 (36.7)	0.302
Organisational obstacles[φ]	0 (0.0)	3 (14.3)	4 (19.0)	10 (47.6)	4 (19.0)	3 (7.7)	3 (7.7)	6 (15.4)	9 (23.1)	18 (46.2)	3 (5.0)	6 (10.0)	10 (16.7)	19 (31.7)	22 (36.7)	0.105
Poor image of the pharmacists role in society[φ]	1 (4.8)	5 (23.8)	10 (47.6)	4 (19.0)	1 (4.8)	6 (15.4)	5 (12.8)	5 (12.8)	2 (5.1)	21 (53.8)	7 (11.7)	10 (16.7)	15 (25.0)	6 (10.0)	22 (36.7)	0.001
Lack of drug information resources[φ]	8 (38.1)	3 (14.3)	4 (19.0)	1 (4.8)	5 (23.8)	11 (28.2)	6 (15.4)	15 (38.5)	4 (10.3)	3 (7.7)	19 (31.7)	9 (15.0)	19 (31.7)	5 (8.3)	8 (13.3)	0.266

Φ Indicates some missing data

1 = Least significant barrier

5 = Most significant barrier

provision, while their counterparts from QU-CPH (66.6%) indicated that organisational aspects (*e.g.* lack of clear job description of the pharmacists, lack of support from health authorities to expanded pharmacist role in patient care, weak collaboration among healthcare team members) were the most important barriers. Lack of drug information resources was perceived to be the least important barrier by respondents from QU-CPH and KU-FoP (52.4% and 43.6%, respectively). A significantly greater proportion of respondents from KU-FoP compared with QU-CPH rated "poor professional image of the pharmacist in the society" as a significant barrier to PC provision (53.8% vs. 4.8%; p=0.001).

Discussion

Many schools of pharmacy in developing countries have strived to develop and implement PC education to meet the needs of patients and society for competent pharmacists. The present study represents the first head-to-head comparison between two countries on self-reported attitudes, perception of preparedness, and perceived barriers towards PC provision of undergraduate pharmacy students in the Middle East. Pharmacy students from QU-CPH and KU-FoP similarly expressed positive attitudes towards PC practice and perceived themselves to be prepared to apply PC in their future practice. In this study, the majority of the respondents from both universities expressed preferences to work in a hospital pharmacy setting upon graduation. This is not surprising considering the realities of the practice of pharmacy in the region where most of the focus is on progressive hospital pharmacy practice compared to community pharmacy practice (Kheir & Fahey, 2011). The community pharmacy sector was the least preferred future practice site among the students. Pharmacists could miss the opportunity to provide useful PC services to the public in such a readily accessible clinical setting. The reasons behind students' lack of interest in community pharmacy practice warrant further investigation. Possible explanations include fear of poor remuneration of pharmacists in this sector or students' lack of trust in their own abilities to manage the humanistic and fiscal resources of a community pharmacy immediately after graduation. Pharmacy graduates might need training on the management of community pharmacies, as well as governmental support to establish and run these pharmacies.

The present study showed that the majority of students agreed that the PC curricula content and education in their respective schools was sufficient to prepare them to deliver PC services in their future practice. However, they seemed to be advocating for further educational preparation and training on PC practice. The vast majority of the respondents from QU-CPH and KU-FoP expressed positive attitudes towards PC practice. This is in agreement with the findings of previous studies conducted in a number of developing countries (Al-Arifi, 2009; Udeogaranya *et al.*, 2009), including Qatar (El Hajj *et al*., 2014) and Kuwait (Katoue *et al*., 2014a). This indicates that the current curricula of the two pharmacy schools seemed to be successful in instilling students with positive attitude towards the provision of PC services. In the current study, respondents from the two universities similarly reported higher levels of perceived preparedness to perform most of the technical, communication, and psychosocial aspects of PC as compared to the administrative aspects. This finding is comparable to an earlier study about PC education in Kuwait (Katoue *et al*., 2014a), as well as to a previous study conducted in the US (Ried *et al*., 2002). Therefore, the content of the courses covering the administrative aspects of PC within the pharmacy curricula of the two schools of pharmacy warrants evaluation and curricular refinements. Furthermore, most students from the two faculties reported relatively low preparedness level to determine drugs' pharmacokinetic parameters as compared to the other technical aspects. This highlights a need to assess the current teaching strategy for the pharmacokinetics courses at the two faculties and to adopt strategies to help students link this essential pharmaceutical discipline to their experiential training as well as, to their future practice (Kheir *et al.* 2015).

Several studies have reported similar barriers that are consistent with the current study (Uema et al., 2008; Udeogaranya *et al*., 2009; El Hajj *et al*., 2014; Katoue *et al*., 2014a, 2014b; El Hajj *et al*., 2016). It was noted in this study that students in KU believed that a poor image of the pharmacist was a significantly more important barrier compared to students in QU. This is consistent with an earlier study in Kuwait (Al-Taweel *et al*., 2013) which reported that physicians see pharmacists solely as 'dispensers' and that patients believe that pharmacists' roles are limited to being 'drug experts'. The image of the pharmacist in Kuwait and Qatar is expected to change as a result of progressive pharmacy education that emulates Western education standards, strategic healthcare plans aimed at achieving international standards, and a progressive pharmacy leadership. Potential solutions to students' perceived barriers to PC practice include restructuring the pharmacies' layout to provide private counselling areas and developing national standards of practice to define the roles and responsibilities of the pharmacist in patient care. It was promising to note that the students' least perceived barrier to PC practice was lack of drug information resources. This would indicate that students have good accessibility to drug information resources, including electronic ones. This aligns with students' high perceived preparedness level to use data/computers in professional practice and can facilitate the delivery of effective and safe PC services to patients.

One of the limitations of this study is the students' self-reporting of attitudes and preparedness to provide PC. There could be a potential for response bias by the students, in that students could have provided socially desirable responses. Moreover, students' self-reporting of attitudes and preparedness to provide PC may not necessarily reflect their future practice behaviour. The

results are from QU-CPH and KU-FoP and thus may not be applicable to other pharmacy colleges in the Middle East region. This may affect the generalisability of the findings of this study. Other limitations include small sample size, disproportionate female respondents as the number of female students is predominant in the two universities and some missing responses to some of the questionnaire items.

Conclusions

Final-year pharmacy students from QU-CPH and KU-FoP have expressed positive attitudes towards PC practice and perceived themselves to be prepared to perform most of the PC competencies. Overall, they felt that the current PC curricular content provided at their schools was sufficient for their preparation for the delivery of PC services in their future practice, while calling for more educational preparation and experiential training on PC practice prior to their graduation. The authors believe that the development of pharmacist provided PC services requires improved partnership between faculties of pharmacy, governmental authorities and other key stakeholders to overcome the existing barriers to PC implementation. Such partnership will go a long way towards empowering pharmacists with the needed attributes to maximise PC application.

Conflict of interest

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