

Perspectives of pharmacy students in Qatar toward interprofessional education and collaborative practice: a mixed methods study.

EL-AWAISI, A., EL HAJJ, M.S., JOSEPH, S., DIACK, L.

2018

This is an Accepted Manuscript of an article published by Taylor & Francis in *Journal of Interprofessional Care* on 27/7/2018, available online: <http://www.tandfonline.com/10.1080/13561820.2018.1498466>

Middle Eastern perspectives of pharmacy students toward interprofessional education and collaborative practice: a mixed methods study

Background

Traditionally, healthcare students are educated unprofessionally with little or no interaction with other healthcare professions. As such, students focus on their own professional competencies. These students lack opportunities to develop interprofessional communication skills and to understand other healthcare professionals' contributions to a team. This impedes collaborative practice in healthcare settings after they graduate (Poore, Cullen, & Schaar, 2014). However, in the last twenty years, Interprofessional Education (IPE) has gained momentum globally and is established in countries such as Canada, United States, Australia, and the United Kingdom (H. Barr, 2015). Yet IPE is still in its infancy in the Middle East with only a few recent studies from Middle Eastern countries (El-Awaisi, Awaisu, et al., 2017; El-Zubeir, Rizk, & Al-Khalil, 2006; Khan, Madu Emeka, Aljadhey, & Haseeb, 2015; Wilbur & Kelly, 2015; Wilby et al., 2015; Zeeni et al., 2016).

In an IPE environment, students are provided with a structured opportunity enabling them to interact with other healthcare professionals where they acquire the knowledge, skills, professional attitudes, and attributes to work collaboratively as part of their undergraduate learning experience (Horsburgh, Lamdin, & Williamson, 2001). It is expected that students will have an improved understanding of the roles, responsibilities and contribution of other healthcare professions; feel at ease when interacting with other healthcare students; build trust and respect; enhance interprofessional working and collaboration, and break down professional hierarchy with the result of improving patient-centred and team-based care (Darlow et al., 2015; Heuer, Geisler, Kamienski, Langevin, & O'Sullivan Maillet, 2010; Horsburgh et al., 2001; Young, Baker, Waller, Hodgson, & Moor, 2007). Overall, students respond positively to IPE with improved perceptions and they gain the knowledge and skills needed for collaborative practice (Reeves et al., 2016). Once they graduate, it is anticipated that they will be able to translate learning into practice (Horsburgh et al., 2001; Reeves et al., 2016). The practice environment is often complex and intense. A high level of interpersonal skills are required for healthcare professionals to be able to work in an adaptable, flexible and collaborative manner appreciating the roles of the different health care professionals (Hammick, Freeth, Koppel, Reeves, & Barr, 2007). Health professionals who learn together and understand each other for the enhancement of quality care is the way forward, as identified by the international research evidence (Hugh Barr, Helme, & D'Avray, 2014;

Hammick et al., 2007; Reeves et al., 2016; Reeves et al., 2008; Remington, Foulk, & Williams, 2006; WHO, 2010).

There is some research evidence demonstrating that certain student characteristics are linked to positive attitudes towards IPE and collaborative practice. These include age, gender, professional programme, patient care experience, and previous IPE experiences (Al-Eisa et al., 2016; Hood et al., 2014; Horsburgh et al., 2001; Judge, Polifroni, & Zhu, 2015; Lie, Fung, Trial, & Lohenry, 2013; Michalec, Giordano, Arenson, Antony, & Rose, 2013; Morison & Jenkins, 2007; Wilhelmsson, Ponzer, Dahlgren, Timpka, & Faresjö, 2011; Wong, 2015). Only one study detected differences between different professions and this was for junior students (Lie et al., 2013) and another demonstrated no significant effect linked to gender, previous exposure to IPE, professional programme, and previous leadership experience (Bradley, Cooper, & Duncan, 2009). Integrating students into the planning process and taking their insights and perspectives are vital before designing any programme. Therefore, it is imperative to explore the perspectives of key stakeholders, including students, regarding any change and to measure their readiness before initiating the process.

The Qatari Perspective

Pharmacy practice in Qatar has evolved in the last 10 years. The establishment of the first and only College of Pharmacy in Qatar with full Canadian accreditation (Canadian Council on Accreditation of Pharmacy Programs (CCAPP)) and the recent advancements in the role of the pharmacists globally, especially in the hospital sector have contributed significantly. Allied to this is the increasing number of qualified clinical pharmacists and the implementation of integrated automated dispensing unit (pharmacy robots) (Kheir & Fahey, 2011). The College of Pharmacy at Qatar University offer a five year Bachelor of Science in Pharmacy (BSc Pharm) and two postgraduate programs: Doctor of Pharmacy (PharmD) and Master of Sciences (MSc Pharm). These programs are delivered in English. The Doctor of Pharmacy program supports an advanced clinical pharmacy practice which includes 32 weeks of experiential training where pharmacy students are trained to be integral members of the healthcare team assuming direct patient care responsibilities and ensuring safe and effective use of medications (Babiker, Carson, & Awaisu, 2014; Wilbur, Paiva, & Black, 2015). The BSc program is currently offered only to female students while the postgraduate programs are offered to both genders. There are plans to offer the BSc program to male students in 2018. Students at the College of Pharmacy are a heterogeneous group from diverse ethnic backgrounds with a large number born and raised in Qatar.

Most Western accreditation bodies call for the incorporation of IPE into the curricula of healthcare programmes. Recognising the importance of incorporating IPE, CCAPP standards, effective from January 2013, have addressed the necessity of incorporating IPE within the pharmacy curricula (CCAPP 2014). As such, it was the intention of the College of Pharmacy at Qatar University to incorporate IPE initiatives formally into the pharmacy curriculum with other healthcare students in Qatar, aligned with accreditation standards and the recommendations set in the World Health Organization (WHO) framework (WHO, 2010). Prior to the data collection of this study, two IPE activities had taken place informally based on faculty interest.

Assessment of readiness is critical and is an important step prior to developing an IPE programme that is sustainable, relevant, and that takes into consideration the needs of the key stakeholders. Therefore, soliciting and analysing student perspectives will not only improve the educational experience for the students but will result in an increase in students' motivation and interest. It will also inform curriculum development regarding the adaptations required taking into consideration cultural and contextual factors which may be different in the Middle East (Acquavita, Lewis, Aparicio, & Pecukonis, 2014; El-Awaisi, Saffouh El Hajj, Joseph, & Diack, 2016). Furthermore, the WHO has emphasised that while striving to maintain the highest standards of care, an effective model of interprofessional collaboration must be established that is regionally distinct and taking into consideration the unique needs of those served (WHO, 2010).

Within IPE research, study designs lack rigour and a lack of measures to assess the impact IPE has on patient and professional practices. There is also an inability to confirm the assumption that IPE will prepare students for collaborative practice (Oates & Davidson, 2015; Reeves et al., 2008). Large numbers of instruments for measuring attitudes toward IPE exist but unfortunately, none are of high quality (C & Brandt, 2015; Thannhauser, Russell-Mayhew, & Scott, 2010). One review identified and analysed twenty-three instruments within the interprofessional literature (Thannhauser et al., 2010). However, the majority of these instruments had little satisfactory data with regard to their psychometric properties and were found to have limited use. One of the most widely adopted instruments is the Readiness for Interprofessional Learning Scale (RIPLS), first published in 1998, with a focus on measuring readiness for IPE. Although it has been recently criticised because of the lack of evidence for its validity and its insensitivity to detect changes in attitudes (Mahler, Berger, & Reeves, 2015; McFadyen et al., 2005), it is a useful to measure readiness to IPE before its implementation which is the case in this study (Parsell & Bligh, 1999). Moreover, RIPLS has been translated and adapted into different cultural context in countries around the world, especially those new

to IPE, and was adapted for the Middle Eastern context (El-Zubeir et al., 2006). Therefore, for those starting with IPE, using the RIPLS maybe more useful and meaningful in contrary to western countries where interprofessional working is more of the norm.

However, it is important to note that mixed methods research is becoming increasingly desired in the field of IPE due to the complex nature of IPE. This study design provides greater insight into the perceptions and impact of IPE on individuals, the population, and the health system (Mackay, 2004; Outcomes., 2015; Reeves, Boet, Zierler, & Kitto, 2015). This methodology ensures optimal design of IPE research, building a credible body of knowledge evidenced by well-designed studies. Mixed methods' studies effectively address the research problem that one approach alone will not provide. (Brandt, Lutfiyya, King, & Chioreso, 2014; Cox, Cuff, Brandt, Reeves, & Zierler, 2016; Creswell & Plano-Clark, 2011; Outcomes, Health, & Medicine, 2015; Thannhauser et al., 2010). This mixed methods' study seek to combine self-perceived students' scores in pedagogical research, with a deeper analysis of the perceived perspective using qualitative methods.

Therefore, this study is novel in utilising mixed methods to explore student perceptions from both the Middle Eastern context and pharmacy perspectives. It is part of a larger research study investigating pharmacy perspectives of IPE and collaborative practice in Qatar and the Middle East accounting for students, pharmacy academics and practising pharmacists. The aims of this study are to:

- Explore the awareness, views, attitudes and perceptions of pharmacy students in Qatar towards IPE and collaborative practice.
- Identify enablers and barriers perceived by pharmacy students resulting from integrating IPE into the pharmacy curriculum.
- Identify resources needed to implement IPE within the pharmacy curriculum.

Ethical considerations:

The study was approved by and Qatar University (QU) Institutional Review Board (QU-IRB 228-E/13) and the Robert Gordon University (RGU) School of Pharmacy and Life Sciences Research Ethics Committee (RGU-6-June-2013), Aberdeen UK.

Research Design

A two-staged sequential explanatory mixed method design was used to comprehensively capture the perspectives of pharmacy students towards IPE and collaborative practice. A quantitative survey was conducted as the first stage of the study. This was followed by an in-depth discussion of these perspectives from pharmacy student representatives through a

qualitative phase comprising two focus groups. This was followed by integrating, analysing and interpreting the data from both stages.

Stage 1: Quantitative Survey

➤ Study design

This was an exploratory cross sectional survey of all pharmacy students at the College of Pharmacy in Qatar University. Universal sampling was used due to the small number of pharmacy students at the College. The language of instruction at the college is English so the survey was self-administered in English.

➤ Survey design

A self-administered online survey, created in Snap 10 Professional®, was used to solicit anonymous responses from the respondents. The survey consisted of 15 questions. The survey was based on a modified version of the Readiness for Interprofessional Learning Scale (*RIPLS*) validated to measure readiness for IPE in a Middle Eastern context (El-Zubeir et al., 2006). It has been argued that high scores on assessments of students' knowledge, skills and attitudes are an indicator of success for IPE programmes and suggest a high level of readiness (McFadyen, Webster, & Maclaren, 2006; Tyastuti, Onishi, Ekayanti, & Kitamura, 2014). The Middle Eastern version, adapted in this study, was deemed the most compatible with the Qatari context and an appropriate cultural comparator (Zeeni et al., 2016). Additional questions, based on published literature and the authors' experiences were added to further explore students' perceptions. The survey contained questions related to the following domains:

- Questions 1-5: Participant characteristics (gender, age, year of study, nationality, and current marital status).
- Questions 6-8: students' prior exposure to IPE (previous RIPLs questionnaire).
- Question 9: RIPLS scale using 20-item 5-point Likert scale (strongly disagree=1, disagree, undecided, agree and strongly agree=5) from the modified version of the RIPLS validated for students in the Middle East.
- Questions 10-13 were questions on future IPE opportunities students wish to undertake and their view on assessment.
- Questions 14-15 were questions on additional comments about IPE and collaborative practice.

Possible scores for the RIPLS range from 20 to 100, with high scores reflecting a higher level of readiness and a positive attitude. The 20 items were divided into three subscales with

internal consistency reliability of these subscales, assessed by Cronbach's alpha, was reported to be strong with 0.86 for teamwork and collaboration (10 statements), 0.80 for professional identity (5 statements), and 0.80 for patient centredness (5 statements). Permission to use this scale was granted by the authors (El-Zubeir et al., 2006). A pilot involving five students was conducted to test for content and face validity and to assess usability of the survey. Only minor amendments to the wording were recommended. Students involved in the pilot were excluded from the study thereafter.

➤ **Survey implementation**

The survey was distributed to all pharmacy students, including undergraduate and postgraduates, studying at the College of Pharmacy in Qatar University (n=132) during the period between September, 2013 to November, 2013. All students at the College of Pharmacy received the weblink to the survey and further information on the study through their email. Two reminders were sent to the students. Students could be entered into a draw for the book "Drug Information Handbook" as an incentive to increase response rates.

➤ **Data Analysis**

Completed surveys generated emails that were sent directly to the principal researcher. These anonymised online submissions were imported immediately to in Statistical Package for Social Sciences, version 22 (IBM SPSS® Statistics for Windows; IBM Corp, Armonk, New York, USA). Both descriptive and inferential statistics were utilised to analyse the results using SPSS version 22.0. Descriptive statistics (frequencies, percentages, mean, and standard deviations) were applied to fully describe respondents, views, attitudes, and experiences. For this analysis, students in their first and second years were categorised as junior pharmacy students; third and fourth year students were categorised as senior pharmacy students and MSc and PharmD students as postgraduate students. A one-way ANOVA was carried out to investigate the relationship of professional years' groups (junior, senior and postgraduate students) on attitudes (RIPLS subscale) with *post hoc* analysis using Tukey's test to determine differences between groups. Additionally, a series of independent *t* tests were carried out. To analyse responses based on a standard Likert scale with a score of 1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree and 5 = strongly agree. Overall, mean ratings for each statement answered for each of the student groups were calculated and expressed as means and standard deviations. *P* values at ≤ 0.05 were considered significant. Negative statements were reversely scored. These were:

- Question 9, statement 11: I don't want to waste my time learning with other health care students*

- Question 9, statement 12: It is not beneficial for undergraduate health care students to learn together*
- Question 9, statement 13: Clinical problem-solving skills should only be learned with students from my own discipline*
- Question 9, statement 14: The function of nurses and therapists is mainly to provide support for doctors*

The first three statements were reversed in one study by McFadyen (McFadyen et al., 2005) and the last one was reversed in another study as it was perceived as hindering the full potential of nurses and therapists in integrating with the healthcare team (Tamura et al., 2012). Reversing was completed to be consistent with other items as higher scores correlates with more readiness (Hertweck et al., 2012). Reliability analysis was performed on the RIPLS statement by obtaining a value for Cronbach's coefficient alpha.

Stage 2: Qualitative Focus group

Two focus groups were conducted with the two groups of pharmacy students:

1. Junior pharmacy students (no experiential training in year 1 and 2);
2. Senior pharmacy students (have had an experience in pharmacy practice in years 3 and 4, and MSc and PharmD students).

Only students who expressed interest, from the survey, to participate in the focus group were part of the sampling pool. The principal researcher sent the invitations with an information leaflet about the study as an email invite, one month in advance, until a minimum of 10 had accepted the invitation. A reminder was sent again a week before the focus group scheduled date. Over-recruiting of participants has been recommended as a strategy in way to control for absences (Bryman, 2015; Morgan, 1995). A moderator and interview guide was developed based on the generated results from the quantitative survey stage and on good practice for conducting focus groups (Krueger & Casey, 2009; Rea & Parker, 2014). Ample opportunities were given by the moderator to further explore certain points raised by participants. An independent experienced transcriber transcribed the audio files verbatim and transcripts were verified and validated by the study principal researcher. Thematic analysis was undertaken on the transcripts (Braun & Clarke, 2006). The principal researcher (AE) listened to the recordings and checked the transcripts for accuracy and reliability. AE then reviewed the transcripts several times for familiarization with the data, to immerse further with the content of the full transcription ensuring thorough understanding of the content. AE then searched for themes. Themes were inductive and emerged iteratively. A second member of the supervisory team (LD/SJ) reviewed the transcripts to validate the main emerging themes, assuring reliability and validity. Themes and subthemes were reviewed by AE and a thematic table was developed

for this purpose. All researchers (AE/LD/SJ) met thereafter to discuss the themes/ subthemes and identify similarities and differences until a consensus was reached on all the themes.

Results

Stage 1

➤ Demographic data

The survey was sent to 132 pharmacy students and collected over a period of eight weeks. The response rate was 102/132 (77%). Table 1 shows the sociodemographic and faculty characteristics of students who responded to the survey. The majority of the respondents were female (92%, n=94). Almost three quarters of the respondents were aged between 20-24 years old (73%, n=75). Nearly one third of the student respondents were from Egypt (29%, n=30), followed by Sudan (15%, n=15) and then Palestine (13%, n=13). The majority of the respondents were undergraduate students (79%, n=81).

➤ RIPLS Scale for pharmacy students

Although most students (86%, n=87) did not complete the RIPLS survey previously and less than a quarter of the students (24%, n=24) had previous IPE activities, it was evident from the student responses that the majority agreed or strongly agreed with the positive statements. The RIPLS survey had good internal consistency, $\alpha = 0.896$ for the 20 included statements. Twenty-three of the respondents (23%) described briefly these IPE encounters. These included a two-day IPE workshop at Calgary University Qatar (n=9); didactic lecture introducing IPE for first year students (n=5); skills competition for healthcare students (n=2); unplanned interaction with other healthcare students during their internships (n=3); multidisciplinary educational sessions during internships (n=1); and an online course (n=1).

Comparison of RIPLS means, for each statement, between groups

Overall, RIPLS mean scores did not significantly differ across the three groups (Table 2). It is interesting to note that junior pharmacy students had the highest mean score for every statement in subscale 1: teamwork and collaboration. However, statistically significant differences were identified for two of the RIPLS items:

- Shared learning will help me to understand my own limitations, $F(2, 99) = 4.04, p = 0.021$. *Post hoc* comparisons using the Tukey HSD test revealed that the mean score for the junior undergraduates ($M = 4.63, SD = 0.77$) was significantly different than the mean score for postgraduates ($M = 4.05, SD = 0.74$)

- Shared learning before qualification will help me become a better team worker, $F(2, 98) = 5.47, p = 0.006$. *Post hoc* comparisons using the Tukey HSD test revealed that the mean score for the junior undergraduates ($M = 4.64, SD = 0.54$) was significantly different than the mean score for senior undergraduates ($M = 4.51, SD = 0.99$) and for postgraduates ($M = 4.05, SD = 0.74$)

5.3.1.4 Variables tested that may affect attitudes

Comparison of the RIPLS subscale means by groups, previous completion of RIPLS, previous experience of IPE and need for assessment were tested. There were no significant difference effects between the subscale means between the groups: junior, senior, or postgraduate students. Additionally, there were no significant differences between the subscale means for respondents who had previously completed the RIPLS versus those who did not. There was a significant difference between the mean score of subscale 1, teamwork and collaboration, between respondents who had previous experience of IPE ($M = 46.0, SD = 4.2$) and respondents who had no previous experience of IPE ($M = 43.0, SD = 6.6$), $t(97) = 2.03, p = 0.045$. Additionally, there was a significant difference between the mean score on subscale 2, professional identity, for respondents who thought it was important to be assessed for IPE ($M = 20.0, SD = 3.78$) and those who did not think it was important to be assessed for IPE ($M = 18.5, SD = 2.59$), $t(98) = 1.99, p = 0.05$.

Types of IPE activities (n=101)

Of the IPE activities, 84% (n=85) requested workshops, 73% (n=74) favoured IPE events, and 55% (n=55) preferred to have it as part of specific courses in the curriculum. The two least favoured options (by only 1% of respondents) were professional development programmes and replacing courses with IPE courses.

Seventy-eight students (out of 101 students) responded to the open question on the type of learning activities they would be interested in participating in with other healthcare students. These included case-based learning focusing on real patient cases (51%, n=40); IPE workshops (14%, n=11); simulation (12%, n=9); IPE clinical placement (5%, n=4); therapeutic knowledge and treatment (5%, n=4); forum to exchange experiences (4%, n=3); integrated care plans (4%, n=3); interprofessional communication (4%, n=3); opportunities for shared decisions (3%, n=2); competitions (1%, n=1); gaming (1%, n=1); health informatics (1%, n=1); journal club (1%, n=1); research (1%, n=1); multidisciplinary educational sessions (1%, n=1); and taking courses together (1%, n=1).

➤ **Pharmacy students and other healthcare students (n=101)**

The survey asked respondents to indicate with which healthcare professions they would like to have an IPE experience. Medical students were ranked the preferred at 97% (n=99) followed by nursing 86% (n=88) and then health sciences 59% (n=60). Other professions noted were 11% (n=11) and included dietitians, nutritionists, biomedical scientists, pharmacy technicians, physiotherapists, paramedics, global health specialists, social workers, psychologists and psychiatrists.

➤ **Importance of assessment**

The survey asked respondents about their thoughts on the importance of assessing students for their IPE activity. In response to questions on the importance of assessment of an IPE activity, nearly two thirds of the students 69% (n=70) thought it was important to be assessed.

5.3.2 Stage 2

Two focus groups were convened, one for junior pharmacy students (n=15) and another for senior students (n=12). The groups were far larger than anticipated. However, it was decided to continue with these numbers to further enhance the breadth of data collected. The focus groups were conducted to gain a depth understanding of the survey results. There were three main themes identified in relation to the pharmacy students' perspectives. These were on the pharmacy students' perception on the enablers, barriers, and recommendations for implementing IPE and collaborative practice (Figure 1). Quotes are presented, in the text, to illustrate the different perspectives presented. Bolded text refers to themes and underlined text refer to the subthemes.

➤ **Pharmacy students' perceptions on enablers**

Focus group participants discussed various benefits and advantages on implementing IPE and collaborative practice. Enablers have been categorised under three different themes. The first is **professional related benefits**. Students were aware of the importance of working together to enhance their interprofessional communication and how as a team they will be more efficient in providing better patient care. Pharmacy students also recognised the need for IPE in terms of understanding the roles and responsibilities of other professions. They highlighted that every profession has limitations and all healthcare professionals are needed to complement each other. They recognised that knowing about other professions will allow them to refer patients to the right person.

You understand the others professional role so when you need some information you know where to go, who to ask, and what their role is (Senior pharmacy student 10).

In addition to understanding others' role, many students highlighted that being in an interprofessional environment would also enhance their understanding of their own roles and responsibilities, their contribution, and their impact in the interprofessional team, creating greater self-confidence. Some students highlighted that a lack of understanding of other professional roles can result in uncertainty in dealing with the others, leading to unclear role boundaries.

It is important to know your role and it is important for you to know the other's role and for others to know your role... Some physicians didn't like know what to expect of you. Like they would suggest medications, they would suggest doses and wouldn't give you like the time to you to suggest yourself (Senior pharmacy student 7)

With 'understanding roles and responsibilities of other professionals' came respect and appreciation of the contribution made by others leading to a healthy productive environment as perceived by students.

The second theme revolved around **patient related benefits**. Students expressed that all healthcare professionals are working toward the same goal: providing patient-centred care and this should be completed collaboratively rather than individually. They agreed that collaborative practice with healthcare professionals working together will result in an improved quality of patient care, leading to an improved healthcare system with better outcomes for the patient and less redundancy, or even contradiction, in information given to patients.

Working collaboratively will reduce drug-related problems and all the problems that would happen due to miscommunication afterwards (Junior pharmacy student 9)

The third theme was the **current positive influences** driving the change towards IPE and collaborative practice. Students mentioned and commented on the following four IPE learning experiences:

- A case based IPE activity, with nutrition students, for second year pharmacy students held at Qatar University;
- A case based IPE activity, with nursing students, for third year pharmacy students held at the university of Calgary;
- An IPE workshop with various healthcare students held at the University of Calgary;
- A skills competition held at College of North Atlantic for senior pharmacy students.

Students thoroughly enjoyed these experiences and found them to be opportunities to exchange knowledge between professions and know about the contributions of others to avoid potential errors in the future.

I was surprised about nurses' knowledge. The advantage of being part of this experience it was like now I can trust nurses more, much better than what I expected before. It was a nice experience (Senior pharmacy student 2).

It was amazing where we have been working with all health disciplines and there were cases related to respiratory, to paramedicine, and dental therapist. Imagine, I didn't know how to work with them before but after the competition, now I am more confident on how to approach these health disciplines (Senior pharmacy student 8).

Students indicated how icebreakers make a difference in breaking the initial barriers and getting to know their team better and become comfortable.

Furthermore, pharmacy students believed that the new pharmacy graduates are drivers for change. Pharmacy students were very enthusiastic on what the future holds for them. They highlighted that they have noticed some changes in the profession and in practice but these changes are very gradual and will take time to be implemented. Junior pharmacy students had a strong desire to drive change in practice and were optimistic that with the IPE training across the different health programmes in Qatar, collaborative practice will exist once they start practising. They expressed the importance of having IPE in their curricula and perceived it as building strong roots for the future.

I think that also when we study from.. at a college level and we graduate you're not just graduating only one student, two or three, you're graduating a whole generation so this will lead the change – the change (Junior pharmacy student 14).

Another positive influence was the employment of healthcare professionals with Western background experience. Students believed that these professionals had collaborative practice experiences and valued the contribution of the pharmacists.

It depends also on the person, I remember in one of the hospitals, I was with a consultant from the UK and because of his background, he had more understanding of the clinical pharmacist roles. And it was actually very comforting to go with him, because he would always like to involve you even if the residents didn't involve you. He would even tell them like this is their role so give them a chance to do – so it was very nice to find someone who actually knows your role and gives you a chance to participate (Senior pharmacy student 5).

➤ **Pharmacy students' perceptions on the barriers**

Focus group participants discussed various challenges and barriers to implementing IPE and collaborative practice. These were categorised under three different themes: previous IPE experiences, educational related issues and current working practices and process.

In addition to the common logistical challenges, such as the need for transportation between the different geographical locations of the different campuses and time spent travelling, students identified and discussed in length a number of different challenges and barriers they faced from participating in the **previous IPE experiences**. The composition of the small groups in an IPE activity, in terms of group dynamics, has been perceived as a challenge to some students. This relates to having students, within the groups, with varying clinical experiences, different professional years, inclusion of male students, leaders in the team, and

personality of the different group members. Students reported being uncomfortable having students with varying levels in the same group.

First of all, the personality of the student and the student confidence changes or like develops with time and with knowledge. So not having student from same level will mean communication would not be so beneficial because they're going to be confident about what they're saying because they're older than us and we will feel we have nothing to contribute (Junior pharmacy student 12).

Additionally, as the College of Pharmacy currently admits only female students to its undergraduate programme, student views differed regarding the inclusion of male students in IPE activities. Students described experiences with male students as posing no issues. The majority agreed on the importance of having IPE sessions with male students, as they will work with them in the future. Still, they noted it will be challenging for some students who always attended segregated schools. In addition, some students are more conservative and may find interacting with male students uncomfortable initially.

We have been studying in the college for four years or five years and we've never had the chance to deal with male students in the classroom, so it will be challenging ... I think maybe for some students it's more of a cultural barrier ... how they were brought up. Therefore, this affect some people and for others it's fine (Senior pharmacy student 10).

Furthermore, senior pharmacy students discussed at length leadership in the team. Reflecting on the IPE activity they had with one profession, nursing, students struggled working at the beginning without medical students. A 'top down' hierarchical direction was noted in the student conversation: doctors, pharmacists, and then nurses. Others argued that this is not always the case and it depends on the personality of the different students.

First of all, the personality of the student and the student confidence changes or like develops with time and with knowledge. So not having student from same level will mean communication would not be so beneficial because they're going to be confident about what they're saying because they're older than us and we will feel we have nothing to contribute (Junior pharmacy student 12).

Another student reflected on another IPE activity where the group chose the leader and found it interesting. They enjoyed that they were given the choice to choose their leader regardless of the discipline. Rotational leadership depending on the situation, the scenario, and expertise where the pharmacy students assumed the roles of the leader was highlighted.

Another common theme identified as a challenge from participating in the IPE activity was a lack of confidence and uncertainty. A number of factors contributed to student uncertainty. These included lack of orientation on what to expect from the session; conducting IPE activities with unfamiliar topics that students have not covered; being the only pharmacy student in the small IPE group; and different approaches to the care plan.

The IPE I was in, they gave us a case on a topic which we didn't study yet, we didn't know the drugs, we didn't know anything, so I was standing there like feeling useless and everybody like, 'what medication do we give, what is the dose?' and 'I didn't know!' (Senior pharmacy student 12).

Students participating in IPE activities for the first time were uncertain of what an IPE activity entails. They found it difficult at the beginning as they were unsure what they should do and how to work together. Other students had an IPE activity in an unfamiliar topic and in one instance, the student felt they had no role to play in the case given to them. Moreover, students expressed concerns regarding the IPE activity where they had to develop a collaborative care plan but the two professions had different approaches to do it that resulted in uncertainty on how to work together and mutually agree on an approach.

One student reflected on an IPE activity where she was the only pharmacy student in her group and felt pressured to be in an environment where other healthcare students were relying on her and, in her view, she had no peer support.

When I was doing IPE workshop, I was afraid of being the only pharmacist there, so I was afraid of doing a mistake, what happens if I don't remember the medication, which I didn't! What happens if I don't know the doses because others are relying on me alone so I am always afraid to be the only one pharmacist and I cannot refer to other pharmacists (Senior pharmacy student 2).

Additionally, some students' uncertainty stemmed from their lack of understanding of their role and what they were required to do in an interprofessional team. Furthermore, junior pharmacy students believed medical students are much more knowledgeable than they are, affecting their confidence when participating in IPE activities. However, participating in these IPE sessions mitigated these concerns.

Although students favoured participating in IPE, and were eager to see it integrated into their curricula, there were mixed views on incorporating assessment into interprofessional activities with most students resisting the idea as the pharmacy curriculum is already 'very heavy' and they feel they are already overloaded with assessments. Students admitted that they are 'grade oriented' and hence, if the IPE sessions were graded, they would 'lose interest' in the activity in which they are participating. Some students reflected on the IPE experience with nutrition students and highlighted how this session stressed the nutrition students who were graded rather than focusing and enjoying the experience as other students did.

The second theme that emerged was related to the **current working practices and processes**. First of these was related to the pharmacists' role and image. Students expressed frustration that the pharmacist's role in practice is 'not well established', with pharmacists being passive and not sharing their knowledge with other healthcare professionals.

The pharmacist is always silent, he's not sharing anything in primary health centre, you see the pharmacist, just sitting in his room, this room, and you can only see him through this, very small window, and he does not interact with the doctors at all. Even, when you go to the hospital, you don't see pharmacists going with, with the doctors in the ward round. Even when they go, when I volunteered once in Hamad Medical Hospital, the pharmacist the only pharmacist who was there, was not talking at all, he was not even participating in the case that was discussed, so only when the doctor asks him, he just answers him. But this is not called collaborative work (Junior pharmacy student 9)

This was attributed to the pharmacists' heterogeneous undergraduate training heavily based on sciences rather than clinical practice and lack of exposure to the concept of team and collaborative practice. Additionally, some students expressed concerns that pharmacists in practice tend to discourage pharmacy students from discussing their recommendations and suggestions with physicians.

Secondly, pharmacy students expressed concerns from the attitude experienced by other healthcare professionals. Lack of appreciation, hierarchy and power were sources of frustration for pharmacy students. Several pharmacy students indicated that many healthcare professionals, mainly physicians, are uncomfortable with the pharmacists 'evolving role' and still perceived pharmacists as professionals 'selling drugs'.

Some doctors just simply don't accept our recommendations. 'I'm a doctor, I know better than you' And some of them don't like pharmacist making interventions or making decisions (Junior pharmacy student 7).

Thirdly, although some students had positive experiences dealing with patients who appreciated the advice given to them by students, many argued that patient attitudes were barriers.

Some patients are very rude--- And they do not accept any intervention from the pharmacist and I cannot blame them. Because pharmacists are not doing their job properly. For example, in a health centre they will write just 'twice daily' and throw the medication and even when I tried to counsel my patient my preceptor would told me, no you don't have time just give them the medication so that's why because they have no expectation from a pharmacist (Senior pharmacy student 9).

Finally, students felt that there is generally a lack of collaborative practice. Senior students reported observing collaboration in some hospitals but that it was not consistent in all the hospitals in Qatar. Additionally, collaboration only occurs on 'a needed basis, there has to be a major problem' according to one senior student. Another junior student anticipated the reality of collaboration to be 'quite poor' according to what they hear. Several senior students noted that in practice, physicians are the leaders of the team with little contribution from other team members.

The only thing that's happening right now is between physicians of different specialties...So for example when they want to diagnose a case, they would all come together and talk to each other but the problem is here, is that it is only between physicians right now. Not involving all the other health care professionals (Junior pharmacy student 9).

Another student blamed physicians for not taking the lead and working collaboratively with the rest of the healthcare team.

➤ **Pharmacy students' recommendations**

Focus group participants made recommendations to implementing IPE and collaborative practice. These were categorised under two themes. The first relating to future IPE activities and the second related to the pharmacy profession.

Students identified courses within their pharmacy curriculum they highlighted as best suited for incorporating **future IPE activities**: Professional Skills and Integrated Case Based Learning courses. Some senior students suggested having an IPE course delivered as an elective as they are already loaded with courses. However, others disagreed, as they believed IPE is essential for all students. Furthermore, students highlighted the need for extracurricular, outreach events focusing on chronic disease like diabetes and hypertension to provide a 'complete comprehensive services to patients'. In addition to IPE activities, students emphasised the importance of social interactions between healthcare students.

Students also reflected upon their IPE experiences and based on the challenges they have faced made several suggestions around the IPE activity. They identified a need for adequate orientation about the IPE activity plan and learning objective prior to the session. When needed, students prefer to work on the same interprofessional care plan. They also highlighted the importance of having students from the same level in the IPE activity and to ensure, whenever possible, that students are at similar levels. Many students asked for IPE sessions to be interactive, use simulation and reflect the different practice settings. Students also reflected on the IPE activities they have been part of and emphasised the importance of using a well-planned icebreaker at the beginning of the IPE session. Many students requested introducing IPE opportunities in clinical placement with other healthcare students.

We [healthcare students] don't have discussion together until we come to the round but at the end of the round we take the file with my preceptor sit down and discuss the case and I wish the medical students, nursing students were with us, with the preceptors discussing and sharing the same file and the same notes. So I felt that that would be very good opportunities. We can have a case, share it together, a real case, real patient case and there they can sit down discuss it together, so we can know their roles, their management and for us what we are expected to do in our management and then we can have preceptors from both sides and having this discussion together at the site of practice (Senior pharmacy student 8).

Students suggested rewarding students with participation certificates and encouraged the idea of competition or challenge where students in their interprofessional teams compete against each team in a friendly environment.

Another important theme that emerged was related to the **Pharmacy profession**. Firstly, students' emphasised the need to improve the professional image of the pharmacist and work on changing the patient and public perception about the pharmacy profession. Secondly, students made several suggestions for how the pharmacy profession can contribute to introducing collaborative practice in Qatar. They highlighted that it is not just students who require the IPE training but healthcare professionals require training and continuous professional development on interprofessional and collaborative practice. Moreover, students expressed dissonance between what is learnt in their programme and the real practice. They expressed that practising pharmacists need to be role models for them. One important suggestion is the need for more support for the pharmacy profession.

I think when, when we start doing our role and taking the responsibilities we will gain the trust and then we will change the perception. The more we are showing our role in front of everyone, with the teams and with the patients, they will change their perception that we are passive, that we are not communicating with others, we're not doing that well (Senior pharmacy student 8).

Media campaigns promoting and representing the pharmacist's role were suggested. Collective effort is needed by pharmacists from all practice settings to know what they are capable of and not to fear being involved and fighting for their rights. This will result in positive perceptions by healthcare professionals, patients and the public.

Discussion

Overall, the results demonstrate a strong readiness and positive perception by pharmacy students toward IPE and collaborative practice. These findings are aligned with previous studies of healthcare students (Ahmad, Chan, Wong, Tan, & Liaw, 2013; Curran, Sharpe, Forristall, & Flynn, 2008; Hind et al., 2003). Pharmacy students had comparable scores to those obtained with healthcare students (i.e. medicine, pharmacy, nursing, and nutrition) from a Lebanese university at baseline for the Teamwork and Collaboration RIPLS subscale and Patient Centeredness subscales. However, our students had higher scores on Professional Identity (Zeeni et al., 2016). The students at Qatar University had slightly better readiness than students in Lebanon. To our knowledge, this is the only study using the same validated Middle Eastern scale to allow for comparison.

These findings confirm that previous exposure to IPE has a positive effect on attitude (Lie et al., 2013; Pinto et al., 2012; Zeeni et al., 2016). Therefore, it is important to incorporate IPE initiatives within student learning. Such initiatives provide students with an opportunity to understand and enhance their appreciation of roles and responsibilities in the interprofessional

team. This interprofessional understanding creates an environment of respect and appreciation amongst team members enabling enhanced collaboration on graduation with the potential for, positive impacts on the quality of patient care (Reeves, 2016).

Students recognised all healthcare professionals are working towards the same goal of providing patient-centred care collaboratively. However, they were concerned about the negative perception of the pharmacist and their role by other members of the healthcare team, especially physicians. Students identified and expressed concerns relating to current working practices and processes during the focus group. They were unhappy with the status of pharmacists in practice and expressed frustration with the passivity of practising pharmacists. It was noted in the focus groups and the literature that physicians were at 'the top of the hierarchy' and other healthcare professionals' contributions were perceived to be marginalised (Lestari, Stalmeijer, Widyandana, & Scherpbier, 2016). This is similar to another study where pharmacy students blamed physicians for their status and, as a result handed power and status back to the physicians (Layzell, 2012). For a healthy interprofessional environment, team members need their roles to be perceived positively by others and hence educators need to be aware that negative perceptions of status may influence the functionality and attitudes of the team members (Morison, Marley, & Machniewski, 2011). An encouraging observation from this study was the desire by junior pharmacy students to be agents of change in practice. They were optimistic, with high expectations that with the IPE training across the different health programmes in Qatar, collaborative practice will exist upon graduation. In contrast, senior students may have felt that this optimism was unrealistic. This was also reflected in the survey results where junior students had the highest mean for subscale 1 (teamwork and collaboration). This could be attributed to the realisation these students were at the beginning of their career and may have not perceived the challenges of practising collaboratively, and these findings concur with previous studies. The difficulties of developing a collaborative practice environment may lead to negative perceptions (Coster et al., 2008; Pollard, Miers, & Gilchrist, 2004; Pollard, Miers, Gilchrist, & Sayers, 2006; Wilhelmsson et al., 2011; Williams et al., 2015).

Furthermore, a study comparing the attitudes of alumni and undergraduate students toward interprofessional healthcare teams found that students had more positive attitudes than the alumni. This was attributed to the fact that alumni, who have been immersed into the real world, were aware of the challenges resulting in less positive attitudes toward interprofessional teams (Makino et al., 2013). A study in Qatar investigating pharmacy students' perceptions to pharmaceutical care, where they work closely with healthcare professionals and patients, demonstrated that senior students who have completed more internships may have noted the mismatch between the theory and the practice. (El Hajj, Hammad, & Afifi, 2014). The same

could be for IPE hence educators should inform students that on entering the practice they may need to be 'agents of change' to promote and advance collaborative working (Rotz, Dueñas, Grover, Headly, & Parvanta, 2015).

The IPE experiences mentioned in this study were initial experiences at the College of Pharmacy and were perceived positively by students, there was some uncertainty because of challenges related to group dynamics, the lack of formal orientation, and guidance on how to work together. This is aligned with other studies that reported student dissatisfaction and negative views from initial IPE experiences (Rosenfield, Oandasan, & Reeves, 2011). Ignoring these concerns may result in intensification of negative attitudes towards participating in future IPE activities and working with other professionals in the practice upon graduation. Therefore, educators need to pay attention to initial concerns. to ensure no profession dominates the discussion (Reeves, Goldman, & Oandasan, 2007). Literature emphasised the authenticity of the learning experience as important factors in influencing positive outcomes and are believed to enhance effectiveness, this was also identified in this study (Hammick et al., 2007; Kilminster et al., 2004).

Students highlighted that there were missed opportunities during the student internship for collaboration with other healthcare students. Additionally, there is resistance for incorporating assessment into IPE as students believed that there was assessment-overload and there was reference to IPE activities where some professions were assessed and others were not. This is an important consideration for future IPE activities. Unfortunately, effective assessment strategies to assess IPE are still lacking and need further investigation. (Beth et al., 2013; Simmons et al., 2011).

In this study, although the majority of students agreed on the importance of having IPE sessions with male students as they will practice with them in the future, it was noted that this could be a cultural challenge to some students. Gender segregation in higher education is the norm in public universities in the Gulf region (Badry & Willoughby, 2015). This does not apply to the rest of the Arab countries. Undergraduate education in Qatar University is gender segregated except for the College of Medicine. However, private universities are not segregated on the basis of gender. To overcome this IPE activities have taken place in non-segregated campuses such as Qatar University College of Medicine, and private universities such as Weill Cornell Medicine, University of Calgary-Qatar and College of North Atlantic.

Pharmacy students were least confident about their professional identity, as demonstrated by their lowest two mean scores for statements on the professional identify scale: 'There is little overlap between my future role and that of other healthcare professionals' and 'The function of nurses and therapists is mainly to provide support for doctors'. This weak sense of

professional identity could stem from lack of role models, the reality of collaborative practice in terms of hierarchy and power, and their previous clinical experience. Their identity is further influenced by the lack of appreciation, and resistance from the healthcare teams, especially physicians, to the evolving role of the pharmacists. The resistance perceived by the physician may stem from their view of the advancing role of the pharmacists as a threat to their professional identity, job security, and struggle with transferring some responsibilities to others within the team to protect their position in the hierarchy structure (Baker, Egan-Lee, Martimianakis, & Reeves, 2011; Solimeo, Ono, Lampman, Paez, & Stewart, 2015; Stull & Blue, 2016). Moreover, pharmacy students had particularly negative views of practising pharmacists' interaction with other healthcare professionals. Action needs to be taken to address this perception of the pharmacists' image, lack of collaborative practice, and lack of role models for students.

It is essential that healthcare students are mentored by exemplary role models during their educational experience, value IPC and effectively communicate with the healthcare team to improve the quality of patient care (Curran et al., 2008; Lestari et al., 2016). Also, students require IPE opportunities to develop the competencies needed for them to be valued members contributing to healthcare teams (Curran et al., 2008). Students observed collaboration in some hospitals in Qatar and hence these environments can be targeted for pharmacy placements to offer the students the chance to observe collaboration in practice. However, practice needs to change and practising pharmacists in Qatar need to become role models. Initiatives include, but are not limited to, offering continuing professional development sessions on interprofessional communication and collaboration to pharmacists, preceptors and other healthcare professionals (El Hajj et al., 2014).

The data collection for study took place prior to formal introduction of IPE into the pharmacy curriculum at the College of Pharmacy and the findings from this research have had significant implications for the development of IPE in Qatar. The interprofessional education committee (IPEC), was formed in April 2014, to provide guidance and support in implementing IPE. This impacted on the curricula of all healthcare programmes in Qatar. There was enthusiasm and motivation for planned IPE activities (Acquavita et al., 2014), engaging stakeholders in IPE steering committees and measuring their readiness for IPE was an opportunity to improve and ensure that planned IPE initiatives work best in the context of their institutions. Overall, the process provided opportunities for key stakeholders to initiate IPE activities that are effective and relevant to their students.. The college has been successful in integrating IPE into their curriculum and these IPE activities have gained positive attention from all the stakeholders and have been incorporated and sustained in the four professional years of pharmacy in recent times (El-Awaisi, Wilby, et al., 2017).

The study provided a unique exploration of the pharmacy perspectives towards IPE and collaborative practice from a Middle Eastern context. 'Readiness assessment' is recommended as a precursor to change implementation using the mixed method approach. Further work is needed to explore the perspectives of other healthcare professions' attitudes and readiness toward IPE and collaborative practice to ensure a comprehensive understanding of readiness of healthcare professionals to IPE and IPC. A similar sequential explanatory mixed method design can be replicated in different contexts to allow for future comparison between different healthcare perspectives.

Strengths of this research included having students from all the pharmacy professional years; the relatively high response rate to both the survey and focus group and the mixed method design which provided a broader evaluation of student perceptions. However, there were a few limitations to this study. The results are the self-reported attitudes of students and hence they need to be interpreted within this context. Additionally, the study only investigated the pharmacy student perspective. The majority of the survey respondents were female, and all focus group participants were female. This may have affected the external validity of the study.

Conclusion

This study has provided a useful insight into the readiness of pharmacy students in a Middle Eastern university. Although small, statistically significant results were noted between the different pharmacy groups, all students had positive attitudes towards IPE and collaborative practice. Students are seeking more IPE experiences formally incorporated into their curricula and hence educators should capitalise on these positive attitudes to find the most effective means for delivering IPE and inform curricula planning. However, pharmacy students identified several barriers which can impede their participation in IPE. These relate to their initial IPE experiences, and the current working practices in terms pharmacist issues with role perception in the healthcare team, healthcare professionals attitudes, patient attitudes and lack of collaborative practice and hierarchy in the workplace. Collaborative practice-ready graduates will produce better educated professionals who are capable of delivering higher quality care. Practice needs to change with an emphasis on improving the pharmacist image to help create and nurture an interprofessional environment where all team members are appreciated and valued.

Acknowledgements

The authors would like to thank all students who completed the survey and participated in the focus group. Thanks to Ms. Ellie Brown for her assistance with the survey analysis.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

Funding

This study was funded by an internal grant from the Office of Academic Research at Qatar University.

References:

- ACCREDITATION STANDARDS for the FIRST PROFESSIONAL DEGREE IN PHARMACY PROGRAMS. (2014). Retrieved from http://www.ccapp-accredit.ca/site/pdfs/university/CCAPP_accred_standards_degree_2014.pdf
- Acquavita, S. P., Lewis, M. A., Aparicio, E., & Pecukonis, E. (2014). Student perspectives on interprofessional education and experiences. *J Allied Health, 43*(2), e31-36.
- Ahmad, M. I., Chan, S. W., Wong, L. L., Tan, M. L., & Liaw, S. Y. (2013). Are first-year healthcare undergraduates at an Asian university ready for interprofessional education? *J Interprof Care, 27*(4), 341-343. doi:10.3109/13561820.2013.769094
- Al-Eisa, E., Alderaa, A., AlSayyad, A., AlHosawi, F., AlAmoudi, S., AlTaib, S., . . . Anwer, S. (2016). The perceptions and readiness toward interprofessional education among female undergraduate health-care students at King Saud University. *J Phys Ther Sci, 28*(4), 1142-1146. doi:10.1589/jpts.28.1142
- Babiker, A. H., Carson, L., & Awaisu, A. (2014). Medication use review in Qatar: are community pharmacists prepared for the extended professional role? *Int J Clin Pharm, 36*(6), 1241-1250. doi:10.1007/s11096-014-0025-8
- Badry, F., & Willoughby, J. (2015). *Higher education revolutions in the Gulf: Globalization and institutional viability* (Vol. 24): Routledge.
- Baker, L., Egan-Lee, E., Martimianakis, M. A., & Reeves, S. (2011). Relationships of power: implications for interprofessional education. *J Interprof Care, 25*(2), 98-104. doi:10.3109/13561820.2010.505350
- Barr, H. (2015). *The Genesis of a Global Movement*. Retrieved from UK:
- Barr, H., Helme, M., & D'Avray, L. (2014). Review of interprofessional education in the United Kingdom 1997–2013. *London: CAIPE*.
- Beth, M.-D., Patricia, S., Anne, M., Denise, M., Valerie, M., Elizabeth, S., . . . Sheri, B. (2013). A Team Observed Structured Clinical Encounter (TOSCE) for Pre-Licensure Learners in Maternity Care: A Short Report on the Development of an Assessment Tool for Collaboration. *Journal of Research in Interprofessional Practice and Education; Vol 3, No 1 (2013)*.
- Bradley, P., Cooper, S., & Duncan, F. (2009). A mixed-methods study of interprofessional learning of resuscitation skills. *Med Educ, 43*(9), 912-922. doi:10.1111/j.1365-2923.2009.03432.x
- Brandt, B., Lutfiyya, M. N., King, J. A., & Chioreso, C. (2014). A scoping review of interprofessional collaborative practice and education using the lens of the Triple Aim. *Journal Of Interprofessional Care, 28*(5), 393-399. doi:10.3109/13561820.2014.906391

- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qual Res Psychol*, 3. doi:10.1191/1478088706qp063oa
- Bryman, A. (2015). *Social research methods*: Oxford university press.
- C, C. S., & Brandt, B. F. (2015). The Readiness for Interprofessional Learning Scale: To RIPLS or not to RIPLS? That is only part of the question. *J Interprof Care*, 29(6), 525-526. doi:10.3109/13561820.2015.1108719
- Coster, S., Norman, I., Murrells, T., Kitchen, S., Meerabeau, E., Sooboodoo, E., & d'Avray, L. (2008). Interprofessional attitudes amongst undergraduate students in the health professions: a longitudinal questionnaire survey. *Int J Nurs Stud*, 45(11), 1667-1681. doi:10.1016/j.ijnurstu.2008.02.008
- Cox, M., Cuff, P., Brandt, B., Reeves, S., & Zierler, B. (2016). Measuring the impact of interprofessional education on collaborative practice and patient outcomes. *Journal Of Interprofessional Care*, 30(1), 1-3. doi:10.3109/13561820.2015.1111052
- Creswell, J. W., & Plano-Clark, V. L. (2011). *Designing and Conducting Mixed Methods Research*, (ed.) Thousand Oaks: Sage.
- Curran, V. R., Sharpe, D., Forristall, J., & Flynn, K. (2008). Attitudes of health sciences students towards interprofessional teamwork and education. *Learning in Health and Social Care*, 7(3), 146-156. doi:10.1111/j.1473-6861.2008.00184.x
- Darlow, B., Coleman, K., McKinlay, E., Donovan, S., Beckingsale, L., Gray, B., . . . Pullon, S. (2015). The positive impact of interprofessional education: a controlled trial to evaluate a programme for health professional students. *BMC Med Educ*, 15, 98. doi:10.1186/s12909-015-0385-3
- El Hajj, M. S., Hammad, A. S., & Afifi, H. M. (2014). Pharmacy students' attitudes toward pharmaceutical care in Qatar.
- El-Awaisi, A., Awaisu, A., El Hajj, M. S., Alemrayat, B., Al-Jayyousi, G., Wong, N., & Verjee, M. A. (2017). Delivering Tobacco Cessation Content in the Middle East Through Interprofessional Learning. *Am J Pharm Educ*, 81(5), 91. doi:10.5688/ajpe81591
- El-Awaisi, A., Saffouh El Hajj, M., Joseph, S., & Diack, L. (2016). Interprofessional education in the Arabic-speaking Middle East: Perspectives of pharmacy academics. *J Interprof Care*, 1-8. doi:10.1080/13561820.2016.1218830
- El-Awaisi, A., Wilby, K. J., Wilbur, K., El Hajj, M. S., Awaisu, A., & Paravattil, B. (2017). A Middle Eastern journey of integrating Interprofessional Education into the healthcare curriculum: a SWOC analysis. *BMC Med Educ*, 17(1), 15. doi:10.1186/s12909-016-0852-5
- El-Zubeir, M., Rizk, D. E., & Al-Khalil, R. K. (2006). Are senior UAE medical and nursing students ready for interprofessional learning? Validating the RIPL scale in a Middle Eastern context. In *J Interprof Care* (Vol. 20, pp. 619-632). England.
- Hammick, M., Freeth, D., Koppel, I., Reeves, S., & Barr, H. (2007). A best evidence systematic review of interprofessional education: BEME Guide no. 9. In *Med Teach* (Vol. 29, pp. 735-751). England.
- Hertweck, M. L., Hawkins, S. R., Bednarek, M. L., Goreczny, A. J., Schreiber, J. L., & Sterrett, S. E. (2012). Attitudes toward interprofessional education: comparing physician assistant and other health care professions students. *J Physician Assist Educ*, 23(2), 8-15.
- Heuer, A. J., Geisler, S., Kamienski, M., Langevin, D., & O'Sullivan Maillet, J. (2010). Introducing medical students to the interdisciplinary health care team: piloting a case-based approach. *J Allied Health*, 39(2), 76-81.
- Hind, M., Norman, I., Cooper, S., Gill, E., Hilton, R., Judd, P., & Jones, S. C. (2003). Interprofessional perceptions of health care students. *Journal Of Interprofessional Care*, 17(1), 21-34.
- Hood, K., Cant, R., Baulch, J., Gilbee, A., Leech, M., Anderson, A., & Davies, K. (2014). Prior experience of interprofessional learning enhances undergraduate nursing and healthcare students' professional identity and attitudes to teamwork. *Nurse Educ Pract*, 14(2), 117-122. doi:10.1016/j.nepr.2013.07.013

- Horsburgh, M., Lamdin, R., & Williamson, E. (2001). Multiprofessional learning: the attitudes of medical, nursing and pharmacy students to shared learning. In *Med Educ* (Vol. 35, pp. 876-883). England.
- Judge, M. P., Polifroni, E. C., & Zhu, S. (2015). Influence of student attributes on readiness for interprofessional learning across multiple healthcare disciplines: Identifying factors to inform educational development. *International Journal of Nursing Sciences*, 2(3), 248-252. doi:<http://dx.doi.org/10.1016/j.ijnss.2015.07.007>
- Khan, T. M., Madu Emeka, P., Aljadhey, H., & Haseeb, A. (2015). Study investigating pharmacy students' interprofessional perceptions toward the pharmacy profession in Saudi Arabia. *Currents in Pharmacy Teaching and Learning*, 7(1), 62-69. doi:10.1016/j.cptl.2014.09.019
- Kheir, N., & Fahey, M. (2011). Pharmacy practice in Qatar: challenges and opportunities. *Southern Med Review*, 4(2), 92-96. doi:10.5655/smr.v4i2.1007
- Kilminster, S., Hale, C., Lascelles, M., Morris, P., Roberts, T., Stark, P., . . . Thistlethwaite, J. (2004). Learning for real life: patient-focused interprofessional workshops offer added value. *Med Educ*, 38(7), 717-726. doi:10.1046/j.1365-2923.2004.01769.x
- Krueger, R., & Casey, M. (2009). *Focus Groups: A Practical Guide for Applied Research*.
- Layzell, S. (2012). Evaluation of the learning experiences afforded through multipractice learning in primary care: a project in the development of a multiprofessional learning organisation. *Educ Prim Care*, 23(6), 422-429.
- Lestari, E., Stalmeijer, R. E., Widyandana, D., & Scherpbier, A. (2016). Understanding students' readiness for interprofessional learning in an Asian context: a mixed-methods study. *BMC Medical Education*, 16(1), 1-11. doi:10.1186/s12909-016-0704-3
- Lie, D. A., Fung, C. C., Trial, J., & Loheny, K. (2013). A comparison of two scales for assessing health professional students' attitude toward interprofessional learning. *Medical Education Online*, 18, 10.3402/meo.v34i18i3400.21885. doi:10.3402/meo.v18i0.21885
- Mackay, S. (2004). The role perception questionnaire (RPQ): a tool for assessing undergraduate students' perceptions of the role of other professions. *J Interprof Care*, 18(3), 289-302. doi:10.1080/13561820410001731331
- Mahler, C., Berger, S., & Reeves, S. (2015). The Readiness for Interprofessional Learning Scale (RIPLS): A problematic evaluative scale for the interprofessional field. *J Interprof Care*, 29(4), 289-291. doi:10.3109/13561820.2015.1059652
- Makino, T., Shinozaki, H., Hayashi, K., Lee, B., Matsui, H., Kururi, N., . . . Watanabe, H. (2013). Attitudes toward interprofessional healthcare teams: a comparison between undergraduate students and alumni. *J Interprof Care*, 27(3), 261-268. doi:10.3109/13561820.2012.751901
- McFadyen, A. K., Webster, V., Strachan, K., Figgins, E., Brown, H., & McKechnie, J. (2005). The Readiness for Interprofessional Learning Scale: a possible more stable sub-scale model for the original version of RIPLS. *J Interprof Care*, 19(6), 595-603. doi:10.1080/13561820500430157
- McFadyen, A. K., Webster, V. S., & Maclaren, W. M. (2006). The test-retest reliability of a revised version of the Readiness for Interprofessional Learning Scale (RIPLS). *J Interprof Care*, 20(6), 633-639. doi:10.1080/13561820600991181
- Michalec, B., Giordano, C., Arenson, C., Antony, R., & Rose, M. (2013). Dissecting first-year students' perceptions of health profession groups: potential barriers to interprofessional education. *J Allied Health*, 42(4), 202-213.
- Morgan, D. L. (1995). Why Things (Sometimes) Go Wrong in Focus Groups. *Qualitative Health Research*, 5(4), 516-523. doi:10.1177/104973239500500411
- Morison, S., & Jenkins, J. (2007). Sustained effects of interprofessional shared learning on student attitudes to communication and team working depend on shared learning opportunities on clinical placement as well as in the classroom. *Med Teach*, 29(5), 464-470. doi:10.1080/01421590701477381

- Morison, S., Marley, J., & Machniewski, S. (2011). Educating the dental team: exploring perceptions of roles and identities. *Br Dent J*, 211(10), 477-483. doi:10.1038/sj.bdj.2011.963
- Oates, M., & Davidson, M. (2015). A critical appraisal of instruments to measure outcomes of interprofessional education. *Med Educ*, 49(4), 386-398. doi:10.1111/medu.12681
- Outcomes, C. o. M. t. I. o. I. E. o. C. P. a. P., Health, B. o. G., & Medicine, I. o. (2015). *Measuring the Impact of Interprofessional Education on Collaborative Practice and Patient Outcomes; Board on Global Health. Measuring the Impact of Interprofessional Education on Collaborative Practice and Patient Outcomes*. In. Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK338360/>
- Outcomes., C. o. M. t. I. o. I. E. o. C. P. a. P. (2015). *Improving Research Methodologies*. Retrieved from Washington (DC), USA:
- Parsell, G., & Bligh, J. (1999). The development of a questionnaire to assess the readiness of health care students for interprofessional learning (RIPLS). *Med Educ*, 33(2), 95-100.
- Pinto, A., Lee, S., Lombardo, S., Salama, M., Ellis, S., Kay, T., . . . Landry, M. D. (2012). The Impact of Structured Inter-professional Education on Health Care Professional Students' Perceptions of Collaboration in a Clinical Setting. *Physiotherapy Canada*, 64(2), 145-156. doi:10.3138/ptc.2010-52
- Pollard, K. C., Miers, M. E., & Gilchrist, M. (2004). Collaborative learning for collaborative working? Initial findings from a longitudinal study of health and social care students. *Health Soc Care Community*, 12(4), 346-358. doi:10.1111/j.1365-2524.2004.00504.x
- Pollard, K. C., Miers, M. E., Gilchrist, M., & Sayers, A. (2006). A comparison of interprofessional perceptions and working relationships among health and social care students: the results of a 3-year intervention. *Health Soc Care Community*, 14(6), 541-552. doi:10.1111/j.1365-2524.2006.00642.x
- Poore, J. A., Cullen, D. L., & Schaar, G. L. (2014). Simulation-Based Interprofessional Education Guided by Kolb's Experiential Learning Theory. *Clinical Simulation in Nursing*, 10(5), e241-e247. doi:<http://dx.doi.org/10.1016/j.ecns.2014.01.004>
- Rea, L. M., & Parker, R. A. (2014). *Designing and conducting survey research: A comprehensive guide*: John Wiley & Sons.
- Reeves, S. (2016). Why we need interprofessional education to improve the delivery of safe and effective care. *Interface - Comunicação, Saúde, Educação*, 20, 185-197.
- Reeves, S., Boet, S., Zierler, B., & Kitto, S. (2015). Interprofessional Education and Practice Guide No. 3: Evaluating interprofessional education. *J Interprof Care*, 29(4), 305-312. doi:10.3109/13561820.2014.1003637
- Reeves, S., Fletcher, S., Barr, H., Birch, I., Boet, S., Davies, N., . . . Kitto, S. (2016). A BEME systematic review of the effects of interprofessional education: BEME Guide No. 39. *Med Teach*, 1-13. doi:10.3109/0142159x.2016.1173663
- Reeves, S., Goldman, J., & Oandasan, I. (2007). Key factors in planning and implementing interprofessional education in health care settings. *Journal Of Allied Health*, 36(4), 231-235.
- Reeves, S., Zwarenstein, M., Goldman, J., Barr, H., Freeth, D., Hammick, M., & Koppel, I. (2008). Interprofessional education: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev*(1), CD002213. doi:10.1002/14651858.CD002213.pub2
- Remington, T. L., Foulk, M. A., & Williams, B. C. (2006). Evaluation of evidence for interprofessional education. *Am J Pharm Educ*, 70(3), 66.
- Rosenfield, D., Oandasan, I., & Reeves, S. (2011). Perceptions versus reality: a qualitative study of students' expectations and experiences of interprofessional education. *Med Educ*, 45(5), 471-477. doi:10.1111/j.1365-2923.2010.03883.x
- Rotz, M. E., Dueñas, G. G., Grover, A. B., Headly, A., & Parvanta, C. F. (2015). Exploring first-year pharmacy and medical students' experiences during a longitudinal interprofessional education program. *Currents in Pharmacy Teaching and Learning*, 7(3), 302-311. doi:<https://doi.org/10.1016/j.cptl.2014.12.002>

- Simmons, B., Egan-Lee, E., Wagner, S. J., Esdaile, M., Baker, L., & Reeves, S. (2011). Assessment of interprofessional learning: the design of an interprofessional objective structured clinical examination (iOSCE) approach. *J Interprof Care*, 25(1), 73-74. doi:10.3109/13561820.2010.483746
- Solimeo, S. L., Ono, S. S., Lampman, M. A., Paez, M. B., & Stewart, G. L. (2015). The empowerment paradox as a central challenge to patient centered medical home implementation in the veteran's health administration. *J Interprof Care*, 29(1), 26-33. doi:10.3109/13561820.2014.937480
- Stull, C. L., & Blue, C. M. (2016). Examining the influence of professional identity formation on the attitudes of students towards interprofessional collaboration. *J Interprof Care*, 30(1), 90-96. doi:10.3109/13561820.2015.1066318
- Tamura, Y., Seki, K., Usami, M., Taku, S., Bontje, P., Ando, H., . . . Ishikawa, Y. (2012). Cultural adaptation and validating a Japanese version of the readiness for interprofessional learning scale (RIPLS). *J Interprof Care*, 26(1), 56-63. doi:10.3109/13561820.2011.595848
- Tanaka, M., & Yokode, M. (2005). Attitudes of medical students and residents toward multidisciplinary team approach. In *Med Educ* (Vol. 39, pp. 1255-1256). England.
- Thannhauser, J., Russell-Mayhew, S., & Scott, C. (2010). Measures of interprofessional education and collaboration. *J Interprof Care*, 24(4), 336-349. doi:10.3109/13561820903442903
- Tyastuti, D., Onishi, H., Ekayanti, F., & Kitamura, K. (2014). Psychometric item analysis and validation of the Indonesian version of the Readiness for Interprofessional Learning Scale (RIPLS). *J Interprof Care*, 28(5), 426-432. doi:10.3109/13561820.2014.907778
- WHO. (2010). *Framework for action on interprofessional education and collaborative practice*. Retrieved from Geneva:
- Wilbur, K., & Kelly, I. (2015). Interprofessional impressions among nursing and pharmacy students: a qualitative study to inform interprofessional education initiatives. *BMC Medical Education*, 15(1), 1-8. doi:10.1186/s12909-015-0337-y
- Wilbur, K., Paiva, M., & Black, E. (2015). Pharmacy Student and Preceptor Impressions of Faculty Liaison Visits to Experiential Training Sites. *American Journal Of Pharmaceutical Education*, 79(9), 134. doi:10.5688/ajpe799134
- Wilby, K. J., Al-Abdi, T., Hassan, A., Brown, M. A., Paravattil, B., & Khalifa, S. I. (2015). Attitudes of pharmacy and nutrition students towards team-based care after first exposure to interprofessional education in Qatar. *J Interprof Care*, 29(1), 82-84. doi:10.3109/13561820.2014.933949
- Wilhelmsson, M., Ponzer, S., Dahlgren, L.-O., Timpka, T., & Faresjö, T. (2011). Are female students in general and nursing students more ready for teamwork and interprofessional collaboration in healthcare? *BMC Medical Education*, 11, 15-15. doi:10.1186/1472-6920-11-15
- Williams, B., Brown, T., McKenna, L., Palermo, C., Morgan, P., & Brightwell, R. (2015). Students' Attitudes Toward Interprofessional Learning: A Comparison Between Two Universities. *J Allied Health*, 44(4), 201-207.
- Wong, R. L. (2015). *Student Characteristics Associated With Positive Attitudes Toward Interprofessional Education*. Yale Medicine, Thesis Digital Library. . Retrieved from <http://elischolar.library.yale.edu/ymtdl/2027> (Paper 2027.)
- Young, L., Baker, P., Waller, S., Hodgson, L., & Moor, M. (2007). Knowing your allies: Medical education and interprofessional exposure. *Journal Of Interprofessional Care*, 21(2), 155-163. doi:10.1080/13561820601176915
- Zeeni, N., Zeenny, R., Hasbini-Danawi, T., Asmar, N., Bassil, M., Nasser, S., . . . Hoffart, N. (2016). Student perceptions towards interprofessional education: Findings from a longitudinal study based in a Middle Eastern university. *J Interprof Care*, 30(2), 165-174. doi:10.3109/13561820.2015.1117060