



Positive Attitudes Towards Interprofessional Education Between Pharmacy, Nursing, and Allied Medical Sciences Students: a Pilot Study from Jordan

Lobna Gharaibeh ^{1*}, Mariam Ahmad Alameri ², Mai Hawamdeh ³, Aseel Abu Rumman ⁴, Husni S. Farah ⁵, Khalidoun M. Hamdan ⁶ and Salam Al Hyasat ⁷

¹ PhD, Pharmacological and Diagnostic Research Center, Faculty of Pharmacy, Al-Ahliyya Amman University, Amman 19328, Jordan
ORCID: 0000-0002-7490-5465

² PhD, Pharmacological and Diagnostic Research Center, Faculty of Pharmacy, Al-Ahliyya Amman University, Amman 19328, Jordan Email address: m.alameri@ammanu.edu.jo Mobile: +962798400394. ORCID: 0000-0002-1369-6620

³ MSc., Pharmacological and Diagnostic Research Center, Faculty of Pharmacy, Al-Ahliyya Amman University, Amman 19328, Jordan Email address: m.Alhawamdeh@aau.edu Mobile: +962799011228. ORCID: 0000-0003-2433-4083

⁴ Aseel Abu Rumman, MSc. Pharmacological and Diagnostic Research Center, Faculty of Pharmacy, Al-Ahliyya Amman University, Amman 19328, Jordan Email address: a.abdelhameed@ammanu.edu.jo. Mobile: +962790683129. ORCID: 0000-0002-6626-2754

⁵ PhD, Pharmacological and Diagnostic Research Centre, Department of Laboratories Medical Sciences, Faculty of Allied Medical Sciences, Al-Ahliyya Amman University, Amman 19328, Jordan. Email address: h.farah@ammanu.edu.jo. Mobile: +962796535979. ORCID: 0000-0001-8023-236X

⁶ PhD, Faculty of Nursing, Al-Ahliyya Amman University, Amman 19328, Jordan E-mail address: k.hamdan@ammanu.edu.jo. Mobile: +962796009917. ORCID: 0000-0003-0994-4967

⁷ PharmD. Pharmacological and Diagnostic Research Center, Faculty of Pharmacy, Al-Ahliyya Amman University, Amman 19328, Jordan E-mail address: s.hyasat@ammanu.edu.jo. Mobile: +962778524969. ORCID: 0000-0002-6707-9257

* l.gharaibeh@ammanu.edu.jo Mobile: +962796939977

Abstract

Objective: Interprofessional education (IPE) is gaining increased global importance as a strategy to solve the problem of a shortage of health care providers. In this study, an IPE workshop was conducted for the first time at Amman Al-Ahliyya University to evaluate the readiness and satisfaction of students from pharmacy, nursing, and allied medical sciences with IPE activities.

Methods: 4th and 5th year students were invited to participate in an interprofessional workshop that included the problem solving of a clinical case. Pre- and post-test surveys were conducted to assess attitudes and satisfaction.

Results: Attitudes in terms of teamwork and collaboration, professional identity, and roles and responsibilities did not significantly change after the workshop for the pharmacy and nursing students. Attitudes toward communication skills and benefits to the patient significantly increased after the workshop for medical laboratory students. Satisfaction was high after the completion of the workshop, especially concerning collaboration and communication among medical laboratory workers, nurses, and pharmacists, understanding the roles and responsibilities of other health professionals, and willingness to participate in future IPE activities.

Conclusion: Students have positive attitudes towards interprofessional collaboration, which paves the way for more effective IPE activities. Schools of different healthcare professions should actively collaborate to overcome obstacles to implementing these activities.

Keywords

Allied Medical Sciences, Interprofessional education (IPE), Jordan, Nursing, Pharmacy, Workshop.

Introduction

Interprofessional education (IPE) is a critical pedagogical technique for training students in the health professions to develop knowledge, skills, and attitudes that result in interprofessional team behaviors and competence.

Members of the healthcare team must work together to achieve similar goals to improve the patient's experience and outcomes in an increasingly complex healthcare system (Buring et al., 2009a). The provision of high-quality patient care is multifaceted and demands collaboration in an effective manner (Kearney, 2008). IPE may provide a way to improve collaborative effort between different professions, which will improve patient care as reported in the literature. According to studies, learners respond positively to IPE, their perceptions and attitudes toward one another enhance, and they report gains in cooperative knowledge and skills (Reeves, 2016). As stated by the World Health Organization's Framework for Action on Interprofessional Education and Collaborative Practice, IPE happens when two or more professionals learn about, from, and alongside one another in order to enhance health outcomes through successful collaboration (WHO, Accessed April, 2020). The same definition for IPE was presented from the Center for the Advancement of Interprofessional Education: IPE "takes place when two or even more professionals share, learn from, and about one another in order to enhance collaboration and care quality." Organizational assistance, an interprofessional programmatic platform, committed faculty, and student participation recognition are required to develop an IPE program (Bridges et al., 2011). Many different types of IPE activities have been described, including joint courses, case studies, community service learning, interaction with simulated or standardized patients, and joint objective structured clinical examinations (Nagge et al., 2017). In the process of endorsing IPE programs, there is a need to restructure the healthcare plan to encourage teamwork amongst disciplines, improve patient care quality, and improve health outcomes (Buring et al., 2009b; Jormet et al., 2016). One IPE activity included a university-sponsored interprofessional day to determine the knowledge of the non-pharmacy students about the role of community pharmacists and community pharmacist-provided services. After the IPE activity, there was an increase in health professions students' awareness of the role of pharmacists (Vrontos et al., 2011). Salih et al. (2019) found that most of the Applied Medical Sciences internship students believed that collaborating with other

students' experts would make them more helpful members of a health-care team. IPE has the potential to empower students to use their knowledge to improve utilization management, potentially saving money and improving patient outcomes. In an exploratory case study, clinical laboratory science students stated that IPE helped minimize professional hierarchy, enhanced equality, and respect (Salazar et al., 2017). Wang et al evaluated impact of integrated profession-role exchange experiences on 60 student volunteers' perceptions of interprofessional teamwork and their clarity of roles (20 medical students, 20 pharmacy students and 20 nursing students). Students' positive views toward interprofessional collaboration and their role awareness were found to significantly rise after the addition of a profession-role exchange component to the curriculum (Wang et al., 2020). Another study that involved nursing, medical, and pharmacy students evaluated interprofessional communication self-efficacy beliefs of students before and after the course. Participation had a beneficial effect on students' confidence in their own abilities to communicate with others in the health care industry (Hagemeyer et al., 2014).

Nurses positively perceive interprofessional education as an opportunity to increase their knowledge and understand the role of other professions (Fawaz et al., 2019; Wershofen et al., 2016). Interprofessional cooperation between nurses and other health care providers enabled new measures to improve patient management, which may increase patient safety (Yu et al., 2020 ; Powell et al., 2020).

Internationally, there is a growing interest in the development of IPE, with the intended goal of improving healthcare delivery (Carlisle et al., 2004). Despite this, findings from several studies demonstrate that collaboration between these professionals faces many obstacles and may not be spontaneous (Fawaz, 2018). The aim of this study was to introduce Al-Ahliyya Amman University (AAU) students to IPE, evaluate attitudes, and determine readiness to incorporate IPE into undergraduate health professional programs.

Methods

This was the first IPE activity at Al-Ahliyya Amman University (AAU). It was introduced as an IPE workshop. IPE workshop details were announced at the AAU university web site and on social media sites. Students in 4th and 5th years from three health schools: pharmacy, nursing, and allied medical

sciences (medical laboratories) were invited to participate. A total of 41 students participated in the workshop. Institutional Review Board (IRB) approval was obtained before starting the workshop.

The workshop was conducted in two phases within two settings. First, a lecture room was set up in which a pretest survey was administered by the participants, after which an IPE orientation lecture was given to introduce students to the concept of IPE. Then, consenting participants were moved to the library. Participants from the three professions were randomly distributed to six groups, each containing 8–10 students.

Students were offered a case of diabetic ketoacidosis complicated with AKI, where students from each profession had a significant contribution to patient care. Leading questions were also included. A checklist for each profession was prepared to evaluate the students' knowledge, and a communication checklist was prepared to evaluate the interprofessional communication skills among each team. A team discussion for the management of a diabetic ketoacidosis patient was supervised and assisted by a member of the faculty. Using a role-play method, each group presented their proposed clinical management of the case. At the end, all participants were asked to fill out the posttest survey.

Instruments

The Readiness for Interprofessional Learning Scale (RIPLS) survey was selected to evaluate students' attitudes and perceptions of IPE (Mahler et al., 2020). In order to gauge students' feelings about teamwork and collaboration, as well as their negative and positive professional identities, as well as their roles and duties, the RIPLS survey employs a validated, 19-question questionnaire. All items were scored from strongly agreeing = 5 to strongly disagreeing = 1, except items of negative professional identity where reverse scoring was used (e.g., strongly disagreeing = 5, strongly agreeing = 1), 27, 28. Attitudes will be assessed before and after the IPE activity to detect changes.

To evaluate the satisfaction of participants, a questionnaire of 15 items developed by Jung et al. (2020) was utilized.

Statistical analysis was performed using IBM SPSS Statistics for Windows, version 23 (IBM Corp., Armonk, N.Y., USA). Continuous variables were presented as mean SPSS

Statistics for Windows, version 23 (IBM Corp., Armonk, N.Y., USA). Continuous variables were presented as mean SD, and categorical variables were presented as frequencies (%). The Wilcoxon signed-ranks test was used for comparing the means of pretests and posttests as an alternative to the paired-samples t-test due to the small sample size.

Results

A total of 41 participants (75.6%) were female. Most of the participants were 4th year students with an average age of 23.09 ± 3.12. Four students were from another profession, and only 21 (51.2%) participants had previous clinical experience. Two surveys were provided to the participants: the RIPLS and a questionnaire on their previous knowledge of IPE. The pretest was provided to the students before the beginning of the workshop, as shown in the workshop schedule, Figure 1, A.

The questionnaire on their knowledge and experiences that included 5 questions. Most of the students did not have any previous knowledge of IPE or its benefits. In addition, the participants did not receive any information on IPE in their curricula, Figure 1, B.

Pharmacy students' responses to the RIPLS survey taken both before and after the session are summarized in Table 1. There was not a statistically significant difference between the pre- and post-workshop versions of any of the items in the RIPLS survey.

Table 2 displays the responses from the RIPLS survey given to nursing students before and after the program. All the RIPLS survey items also did not show a statistically significant change from pre-workshop to post-workshop, just like with the pharmacy students.

The Allied medical sciences (medical laboratories) students were different from the other two groups, Table 3. Within the collaboration and teamwork subscale, two of the nine questions were substantially different. There was an increase in the mean responses to the questions "Patients would end up benefiting if health care students joined together to tackle patient problems" and "Communication skills should be acquired with other health care students" after the workshop was held. There was no statistically significant difference between the pre- and post-workshop versions of the remaining items on the RIPLS survey.

Figure 1. A: Components of the IPE workshop, **B:** Previous experiences and knowledge of participants concerning IPE

A

Components of the IPE Workshop

Activity	Description of the Activity	Designated Time (Minutes)	Teaching Method
Pretest	Distribution and explanation of surveys	30	Survey
Orientation	Explanation of the components and work flow of the workshop	20	Presentation
Introduction to interprofessional education (IPE)	Presentation that explains the need for IPE, challenges, and benefits	30	Lecture
Getting acquainted with each other	Participants introduce themselves	15	
Break		20	
Distribution of groups	Each group contains 2 members of each profession	10	
Distribution and explanation of the case	The same case is introduced to the participants	10	
Group discussions	Participants discuss the case and reach a decision	30	Group activity
Final problem solving and case presentation (each group will be given 10 minutes)	A representative of each profession presents their contribution to the problem solving	60	Verbal Presentation
Feedback from the supervisors	Supervisors provide comments to the participants according to a rubric	15	Verbal Presentation
Posttest	Distribution and explanation of surveys	15	Survey

B

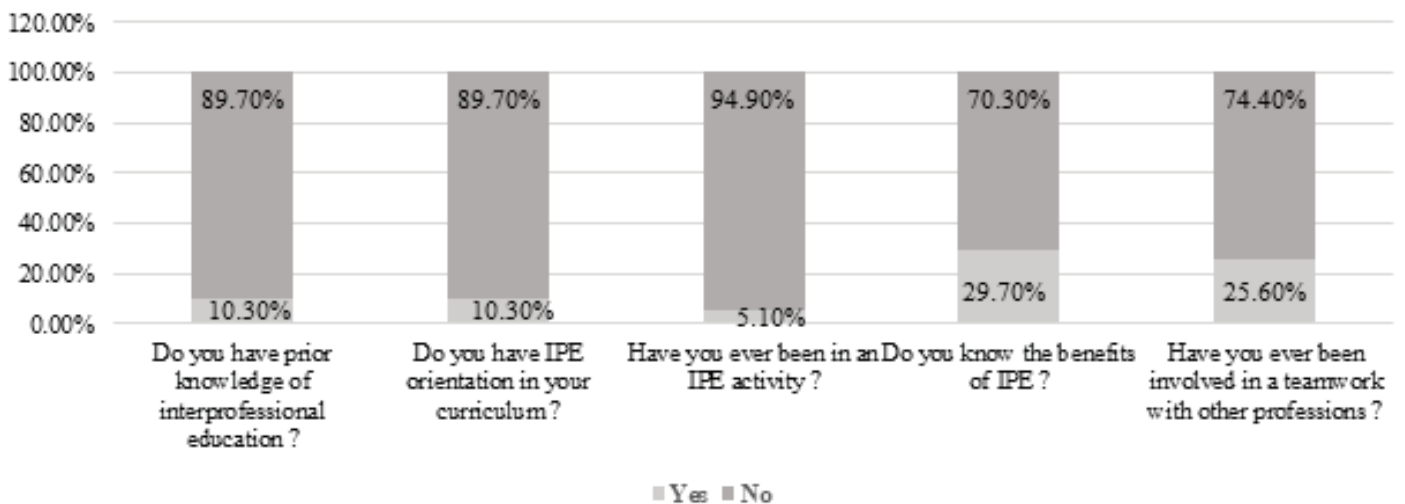


Table 1. RIPLS survey results for Pharmacy students

	Pre-workshop Mean ± SD	Post-workshop Mean ± SD	P value
Teamwork and collaboration			
1. Taking advantage of my peers' knowledge will help me grow become a more valuable part of the healthcare team.	4.27 ± 1.39	4.60 ± 1.06	0.414
2. The patients would benefit from health care students collaborating to find solutions to patient issues.	4.47 ± 1.25	4.67 ± 0.82	0.581
3. By collaborating with other future medical professionals, I will have a deeper understanding of clinical issues.	4.33 ± 1.45	4.80 ± 0.56	0.197
4. Relationships in the health care field would benefit from pre-qualification education with future healthcare providers.	4.13 ± 1.41	4.40 ± 1.06	0.518
5. Health care students should network with others to practice communication	4.07 ± 1.39	4.33 ± 1.11	0.546
6. The knowledge I get from working with others will change my perspective on them.	4.40 ± 1.40	4.80 ± 0.77	0.269
7. Students need to feel safe and respected in their small groups for learning to occur.	4.47 ± 1.41	4.80 ± 0.56	0.461
8. Learning how to work effectively in a team is a skill that all healthcare professionals must acquire.	4.47 ± 1.41	4.60 ± 1.06	0.890
9. The more I learn from others, the more I'll be able to see where I'm falling short.	4.27 ± 1.39	4.87 ± 0.35	0.160
Negative professional identity (reverse coding)			
10. As much as I would like to get an education in the medical field, I have no interest in studying alongside other students.	4.80 ± 0.41	4.73 ± 1.03	0.705
11. Undergraduates in the health care field are not required to study in cohorts.	4.53 ± 0.64	4.60 ± 1.06	0.493
12. Skills in clinical problem-solving can only be taught to students in my own division.	4.40 ± 0.74	4.60 ± 0.63	0.470
Positive professional identity			
13. Through collaboration with other future medical professionals, I will improve my communication skills	4.13 ± 1.36	4.20 ± 1.37	0.855
14. I think it would be beneficial to participate in collaborative projects with other students in the health care field.	4.13 ± 1.19	4.40 ± 0.91	0.506
15. Together, we can dig deeper into the problems that patients are facing.	4.43 ± 1.16	4.60 ± 1.06	0.683
16. As a team player, I can improve through collaborative study before certification. -worker	4.13 ± 1.13	4.33 ± 1.40	0.571
Roles and responsibilities			
17. Nursing and therapy professionals serve mostly as doctors' assistants.	2.20 ± 1.15	1.87 ± 1.13	0.429
18. I have no idea what my future career path will be.	4.27 ± 1.13	2.13 ± 1.60	0.810
19. A lot more than the average health care student, I have a lot to learn.	4.47 ± 1.44	2.93 ± 1.22	0.561

Table 2. RIPLS survey results for Nursing students

	Pre-workshop Mean ± SD	Post-workshop Mean ± SD	P value
Teamwork and collaboration			
1. Sharing what I've learned with other students will make me a stronger contributor to the healthcare team as a whole.	4.27 ± 1.39	4.60 ± 1.06	0.461
2. Collaboration between future doctors and nurses to address patient concerns will benefit everyone.	4.47 ± 1.25	4.67 ± 0.82	0.713
3. By collaborating with other future medical professionals, I will have a deeper understanding of clinical issues.	4.33 ± 1.45	4.80 ± 0.56	0.705
4. Relationships in the health care field would benefit from pre-qualification education with future healthcare providers.	4.13 ± 1.41	4.40 ± 1.06	0.680
5. Health care students should network with others to practice communication	4.07 ± 1.39	4.33 ± 1.11	1.000
6. The knowledge I get from working with others will change my perspective on them.	4.40 ± 1.40	4.80 ± 0.77	1.000
7. Students need to feel safe and respected in their small groups for learning to occur.	4.47 ± 1.41	4.80 ± 0.56	0.655
8. Learning how to work effectively in a team is a skill that all healthcare professionals must acquire.	4.47 ± 1.41	4.60 ± 1.06	1.000
9. The more I learn from others, the more I'll be able to see where I'm falling short.	4.27 ± 1.39	4.87 ± 0.35	0.705
Negative professional identity (reverse coding)			
10. As much as I would like to get an education in the medical field, I have no interest in studying alongside other students.	4.80 ± 0.41	4.73 ± 1.03	0.317
11. Undergraduates in the health care field are not required to study in cohorts.	4.53 ± 0.64	4.60 ± 1.06	0.739
12. Skills in clinical problem-solving can only be taught to students in my own division.	4.40 ± 0.74	4.60 ± 0.63	0.496
Positive professional identity			
13. Through collaboration with other future medical professionals, I will improve my communication skills.	4.13 ± 1.36	4.20 ± 1.37	0.380
14. If given the chance, I'd enjoy participating in collaborative projects with other students in the health care field.	4.13 ± 1.19	4.40 ± 0.91	0.671
15. By working together, we can better understand the root causes of patients' issues.	4.43 ± 1.16	4.60 ± 1.06	0.891
16. Because of my teamwork skills, I will benefit from studying along with other candidates for the certification. -worker	4.13 ± 1.13	4.33 ± 1.40	1.000
Roles and responsibilities			
17. Nursing and therapy professionals serve mostly as doctors' assistants.	2.20 ± 1.15	1.87 ± 1.13	0.380
18. My future career path is unclear to me at this time.	2.13 ± 1.13	2.13 ± 1.60	0.196
19. A lot more than the average health care student, I have a lot to learn.	2.73 ± 1.44	2.93 ± 1.22	0.377

Table 3. RIPLS survey results for Allied Medical Sciences students

	Pre-workshop Mean ± SD	Post-workshop Mean ± SD	P value
Teamwork and collaboration			
1. Sharing what I've learned with other students will make me a stronger contributor to the healthcare team as a whole.	4.77 ± 0.44	4.92 ± 0.29	0.157
2. Collaboration between future doctors and nurses to address patient concerns will benefit everyone.	4.38 ± 0.77	4.92 ± 0.28	0.038
3. My capacity to grasp clinical difficulties will improve as a result of collaborative study with my fellow health care students.	4.69 ± 0.48	4.85 ± 0.38	0.157
4. Relationships in the health care field would benefit from pre-qualification education with future healthcare providers.	4.46 ± 0.52	4.69 ± 0.63	0.257
5. Communication skills should be learned with other health care students	4.23 ± 0.60	4.77 ± 0.60	0.008
6. The knowledge I get from working with others will change my perspective on them.	4.31 ± 0.75	4.83 ± 0.58	0.187
7. Students need to feel safe and respected in their small groups for learning to occur.	4.69 ± 0.85	4.92 ± 0.29	0.414
8. Learning how to work effectively in a team is a skill that all healthcare professionals must acquire.	4.23 ± 1.01	4.62 ± 0.96	0.238
9. The more I learn from others, the more I'll be able to see where I'm falling short.	4.23 ± 0.83	4.69 ± 0.63	0.058
Negative professional identity (reverse coding)			
10. As much as I would like to get an education in the medical field, I have no interest in studying alongside other students.	4.62 ± 0.87	4.62 ± 0.51	1.000
11. Undergraduates in the health care field are not required to study in cohorts.	4.38 ± 0.77	4.38 ± 0.77	1.000
12. Skills in clinical problem-solving can only be taught to students in my own division.	3.92 ± 0.86	4.38 ± 1.12	0.202
Positive professional identity			
13. Through collaboration with other future medical professionals, I will improve my communication skills.	4.23 ± 0.83	4.46 ± 1.13	0.408
14. If given the chance, I'd enjoy participating in collaborative projects with other students in the health care field.	4.38 ± 0.65	4.31 ± 1.18	1.000
15. By working together, we can better understand the root causes of patients' issues.	4.54 ± 0.66	4.23 ± 1.36	0.558
16. As a team player, I can improve through collaborative study before certification -worker	4.46 ± 0.52	4.38 ± 1.19	0.861
17. Nursing and therapy professionals serve mostly as doctors' assistants.	2.00 ± 0.82	1.85 ± 1.14	0.599
18. I have no idea what my future career path will be.	1.77 ± 0.83	2.31 ± 1.65	0.347
19. A lot more than the average health care student, I have a lot to learn.	3.38 ± 1.39	3.58 ± 1.56	0.829

According to the poll results, the majority of students were satisfied with the course. A majority of respondents rated each question at or above a 4. The highest averages were found in Table 4 for questions about medical laboratory workers', nurses', and pharmacists' understanding of one another's roles and duties, as well as students' understanding of the competencies necessary for such collaboration and communication.

Students inside groups were able to effectively communicate with one another, greeting and introducing themselves to one another. acted as a unit, kept eye contact, and shared in decision-making responsibilities. The students reached a collectively satisfying conclusion while dressed professionally (in lab coats or scrubs).

Table 4. Satisfaction with the IPE workshop

	Mean ± SD
1. The workshop's goals were articulated to the students.	4.85 ± 0.53
2. The workshop should be required for senior-level students, and its implementation is desired.	4.34 ± 1.22
3. There was a satisfactory amount of time allotted for the workshop's activities.	4.78 ± 0.53
4. Overall, it was a well-organized workshop.	4.93 ± 0.26
5. The workshop accomplished what it set out to do.	4.90 ± 0.30
6. To accomplish some of the workshop's goals, role-playing proved to be an invaluable tool.	4.73 ± 0.55
7. Understanding the value of teamwork was facilitated by the workshop.	4.90 ± 0.49
8. The workshop provided valuable insight into the importance of IPE.	4.88 ± 0.64
9. I learned a lot about the job of different health professionals from this program.	4.95 ± 0.22
10. The course was informative in that it clarified the skill-set needed for effective cooperation and communication amongst medical laboratory technicians, nurses, and pharmacists.	4.95 ± 0.22
11. The teachers facilitated group work among their healthcare students.	4.95 ± 0.22
12. The professors gave constructive criticism to the students	4.85 ± 0.65
13. The workshop has met my expectations overall.	4.88 ± 0.51
14. Future pupils need access to this program.	4.95 ± 0.31
15. I plan to take part in further initiatives with a similar focus.	4.95 ± 0.22

Discussion

Interprofessional education is a new concept for educational institutions in Jordan. In 2006, the World Health Organization (WHO) declared that there is a worldwide shortage of health workers that can be addressed by many strategies, including “innovative approaches to teaching in industrialized and developing countries”. Interprofessional education was the most promising solution.

The health workforce in Jordan includes physicians, nurses, pharmacists, dentists, laboratory scientists, midwives, physiotherapists, nutritionists, and medical radiation technicians. In 2013, statistics showed that for every 10,000 Jordanians, there were 44.8 nurses, 28.6 physicians, 10.4 dentists, and 17.8 pharmacists. However, this ratio changed in 2017, where for every 10,000 Jordanians, there were 26.5 nurses, 22 physicians, 7.1 dentists, 16.3 pharmacists, and 30 doctors. Furthermore, after the recent flood of Syrian refugees into Jordan, the population has increased tremendously and exerted a heavy burden on the health system and health workforce. In view of previous information, healthcare care providers must collaborate to fill the gaps and work efficiently to meet the increasing demands for healthcare services. This collaboration must start at the undergraduate level, where IPE is implemented in different activities to establish grounds for future collaboration, respect, and trust.

The importance of this study arises from the fact that, to our knowledge, this is the first documented and assessed workshop on IPE in Jordan. Students from three professions interacted with each other, exchanged scientific information, and had their attitudes assessed for the first time.

As expected, most of the students have never been in an IPE activity, have no IPE orientation in the curriculum, and have no knowledge of interprofessional education. Consequently, the gradual introduction of different IPE activities among the specialties involved in healthcare is necessary.

Any training program can be evaluated on four levels: reactions, which measure their engagement and contribution; learning, which measures what they learned; behavior, which measures how people apply what they learned; and results, which measure the outcomes of the program (Aravamudhan, et al., 2015). In our study, we decided to start at the first level since

we are still in the introductory phase and assess the learners' reactions to an IPE workshop. Results demonstrated that, like with other IPE events, participants' preparedness to operate in an interprofessional collaborative context was high to begin with and maintained itself after the workshop (Raymond Chu, O., 2017). Contrary to nursing and pharmacy students, the workshop increased the optimistic outlook of the medical laboratory students regarding communication skills and shared learning. This suggests differences among different professions in terms of the type of suitable IPE activity, their previous attitudes, and their willingness to embrace interprofessional collaboration.

The limited efficacy of the program in changing attitudes suggests that future workshops or IPE activities must be more comprehensive, multifaceted, and provide more time and increased opportunities for discussion, collaboration, and partnership.

In addition, the high positive attitudes before the workshop reflect the willingness of the students, from a theoretical point of view, to cooperate with other professions.

The workshop achieved high scores in terms of the satisfaction of the students, especially on the importance of collaboration and understanding the roles and responsibilities of other health professionals. Participation in future activities with similar objectives, and the importance of providing the workshop to future students. Similar levels of satisfaction were reported by Jung et al. (2020) when an IPE program was implemented among medical, nursing, and pharmacist students in Korea. The workshop implemented in the final year received the lowest satisfaction rating, suggesting that IPE activities would be most beneficial if introduced earlier in students' academic careers. Limitations of the study include a small sample size; further IPE activities should involve a larger sample size. In addition, higher levels must be assessed, such as learning, behavior, and outcomes.

Conclusion

IPE is a solution for the shortage of health care professionals. Cooperation at the professional level must be preceded by IPE activities between students in different health professions. Conducting workshops and sessions is the first step in a versatile group of future steps in IPE implementation, which includes redesigning courses and sessions that achieve interprofessional

collaboration. Because of this, healthcare education institutions need to coordinate their efforts and effectively manage their time in order to face challenges.

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Conflict of interest

The researchers have no conflict of interest to disclose.

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Contribution of the authors

Lobna Gharaibeh, PhD: Conceptualization, data curation, supervision, project administration, Reading and approving the final draft, Data analysis, writing the first draft

Mariam Ahmad Alameri, PhD: Conceptualization, data curation, supervision, project administration, Reading and approving the final draft, writing the first draft

Mai Hawamdeh, MSc: Conceptualization, data curation, supervision, project administration, Reading and approving the final draft, Data analysis

Aseel Abu Rumman, MSc: Conceptualization, data curation, supervision, project administration, Reading and approving the final draft, Review and editing the final Manuscript and rewriting the references.

Husni S. Farah, PhD: Conceptualization, data curation, supervision, project administration, Reading and approving the final draft.

Khaldoun Hamdan, PhD: Conceptualization, data curation, supervision, project administration, Reading and approving the final draft

Salam Al Hyasat, PharmD: Conceptualization, data curation, supervision, project administration, Reading and approving the final draft

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Authors biography

Lobna Gharaibeh: Obtained her PhD in Pharmacy from Jordan University, obtained her MSc in Pharmacy from Jordan University, obtained her BSc in Pharmacy from Jordan University. Currently she is assistant professor of Hospital clinical training at Al-Ahliyya Amman University. Her research interests are clinical pharmacy, pharmacology, Bioethics.

Mariam Ahmad Alameri: Obtained her PhD in Clinical Pharmacy from Universiti Sains Malaysia (USM), Obtained her MSc in Clinical Pharmacy from Jordan University, obtained her BSc in Pharmacy from Jordan University. Currently she is an assistant professor of clinical training at Al-Ahliyya Amman University. Her research interests are Cancer biomarkers, patients' educational programs, clinical research.

Mai Hawamdeh: Obtained her MSc in Pharmacy from Jordan University, obtained her BSc in Clinical Pharmacy from Jordan University. Currently she is responsible of the virtual pharmacy at Alahliyy Amman University. Her research interests are Clinical Pharmacy, Pharmacy Practice, Pharmacology and therapeutics.

Aseel Abu Rumman: Obtained her MSc in Pharmaceutical Sciences from Al-Ahliyya Amman University, obtained her BSc in Pharmacy from Al-Ahliyya Amman University. Currently she is a Lecturer of Drug Delivery Systems, Practical Pharmaceutics, Pharmacy Law and Legislation, and Cosmetic Profession Ethics & Regulations at Al-Ahliyya Amman University. Her research interests are drug technology and cancer studies.

Husni S. Farah: Obtained his PhD in Biochemistry from University college Dublin, obtained his BSc in Biochemistry from Kuwait University. Currently he is a professor of clinical Biochemistry practical, clinical Biochemistry, Biochemistry practical, clinical biochemistry 1, clinical biochemistry 2, Biochemistry, in born errors and metabolic disorders at Al-Ahliyya Amman University. His research interests are Clinical Enzymology and Plasma proteins

Khalidoun Hamdan: Obtained his PhD in critical care nursing from University of Jordan, obtained his MSc in clinical care nursing-critical care from University of Jordan. Obtained his BSc in Nursing from Jordan University of Science and Technology. Currently he is an assistant professor of, adult 1 health nursing, adult 2 health nursing, physical examination, communication skills, medical terminology, intensive clinical training, pathophysiology, clinical judgement, clinical judgement at Al-Ahliyya Amman University. His research interests are critical care nursing - palliative care

Salam Al Hyasat: Obtained her MSc in project management from Al Balqa applied university, obtained her BSc in PharmD from Jordan university. Currently she is the head of development and quality department of PDRC in Al-Ahliyya Amman University. MSc in project management from Al Balqa applied university