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Research

Exploring first-year pharmacy and medical students' experiences during a longitudinal interprofessional education program

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Abstract

Background: Health profession schools have been tasked with implementation of interprofessional education (IPE) within their programs to better prepare students to build effective collaborative health care teams. In 2011, the IPE core competencies were introduced. There is a need to understand whether IPE experiences help students achieve these core competencies. The goal of our research was to explore student-reported experiences relating to IPE core competencies using a qualitative approach.

Methods: Pharmacy and medical students enrolled in combined longitudinal IPE courses during their first professional year were invited to participate in focus groups. Discussions were audio-recorded, transcribed verbatim, and qualitatively analyzed to produce thematic content.

Results: Overall, 18 students participated in three separate focus groups (six students per group). Emergent themes from focus group discussions relating to IPE core competencies included patient care concerns, shared feelings, disconnect between expectations and experiences, perceived role of pharmacists, new learning of pharmacist roles, strategies for effective communication, teamwork, and shared goals. Additional emergent themes were identified that differed and were similar between pharmacy and medical students.

Conclusions: These emergent themes provide evidence that students are at the preliminary stages of demonstrating IPE core competencies. Our study supports the introduction of IPE early in health profession curricula, the adoption of longitudinal course delivery, and the implementation of faculty development to promote achievement of IPE core competencies in a developmentally appropriate manner.

Abbreviations: CC, interprofessional communication competency; CCCP, Camden Community Collaborative Practice; CMSRU, Cooper Medical School of Rowan University; HIV, human immunodeficiency virus; IPE, interprofessional education; IPEC, Interprofessional Education Collaborative; M1s, first-year medical students; P1s, first-professional year pharmacy students; PharmD, Doctorate of Pharmacy; RR, roles and responsibilities competency; TT, teams and teamwork competency; USciences, University of the Sciences; VE, values and ethics competency; WHO, World Health Organization.

Keywords: Experiential education; Interprofessional education; Competencies; Collaborative practice

Introduction

The World Health Organization (WHO) defines interprofessional education (IPE) as the following: "when students from two or more professions learn about, from, and with each other to enable effective collaboration and improve

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health outcomes." This was adapted from the Center for the Advancement of Interprofessional Education's definition to better reflect the global health context.[1,2] Many organizations, most notably the WHO, the Institute of Medicine, and the Accreditation Council for Pharmacy Education, have recommended that health profession schools implement IPE within their programs to prepare future health care providers to build more effective collaborative health care teams once they enter the workforce.[1,3–5] Health care reform promotes collaborative practice as one strategy for enhancing the quality and safety of health care.[6,7] The interdependence between health profession education and collaborative practice is the theoretical basis for implementing IPE within all health profession curricula.[8,9] In 2011, the Interprofessional Education Collaborative (IPEC) introduced four core competency domains to create a coordinated effort across all health professions to incorporate essential content into all health profession curricula (Table 1).[8] Each domain is linked with behavior-based objectives that learners should demonstrate by the completion of the curriculum. The establishment of these competencies encourages purposeful learning with the goal of preparing all health professions to intentionally and effectively work together to improve the current health care system.[6]

Although the IPEC report defines the core competencies of IPE, it does not provide guidelines for implementation within curricula. As a result, there are a variety designs that have been described in the literature, including extracurricular activities, one-day on-campus events, simulation exercises, shadowing, case-based learning sessions, and voluntary student-run clinics.[10–13] A number of investigators have focused their research on objectively assessing students' attitudes and perceptions towards IPE within their respective programs.[10,13–17] There is a lack of both published instruments and qualitative evaluations that assess the effectiveness of programs in relation to the achievement of the core competencies, nor are there benchmarks for curricular planning or assessment of IPE outcomes in a developmentally appropriate manner.[8] We designed this study to begin filling in these gaps in the literature. We chose a qualitative approach to gain a better understanding of the educational experience and solicit students' observations, opinions, and descriptions of their own learning.[18] This would allow us to see through the learners' eyes what gaps exist between our intended curriculum versus the actual delivered curriculum and build on what is currently reported in the literature. The primary objective of this study was to explore student-reported experiences relating to IPE core competencies within our combined IPE courses, and secondarily to identify key emergent themes related to the overall student experience.

Methods

Study design

This was a qualitative study involving focus groups of students enrolled in the first year of a series of required longitudinal IPE courses. Focus group discussions were used to elicit student-reported interprofessional experiences.[19] Computer-assisted qualitative data analysis techniques that rely on coding content were used to produce thematic content about student-reported experiences within IPE.[20] The study was submitted to both University of the Sciences' (USciences) and Rowan University's Institutional Review Boards and approved as exempt research.

Description of the IPE courses

Cooper Medical School of Rowan University (CMSRU) and USciences Philadelphia College of Pharmacy created an IPE experience combining two courses that run simultaneously for 24 weeks throughout the year: an ambulatory clerkship experience of 50 first-year medical students (M1s) and an introductory pharmacy practice experience of 25 selected first-professional year pharmacy students (P1s). The medical school requires participation of all students, whereas, the pharmacy school requires interested students to submit an application for admission into this course. At present, the Doctorate of Pharmacy (PharmD) program is a direct-entry, six-year curriculum and a majority of the students enrolled have earned only a

Table 1
IPE core competency domains and general competency statements

Domain	Competency statement
Values and ethics for interprofessional practice	Work with individuals of other professions to maintain a climate of mutual respect and shared values.
Roles and responsibilities	Use the knowledge of one's own role and those of other professions to appropriately assess and address the health care needs of the patients and populations served.
Interprofessional communication	Communicate with patients, families, communities, and other health professionals in a responsive and responsible manner that supports a team approach to the maintenance of health and the treatment of disease.
Teams and teamwork	Apply relationship-building values and the principles of team dynamics to perform effectively in different team roles to plan and deliver patient-/population-centered care that is safe, timely, efficient, effective, and equitable.

IPE = interprofessional education.

high school diploma. Students were divided into teams of three in a 2:1 ratio (2M1s:P1). The students were under the direct supervision of medicine and pharmacy faculty within a free, student-run clinic for the uninsured and underserved, known as Camden Community Collaborative Practice (CCCP). All roles and responsibilities were completed by all students, both medical and pharmacy, and include scheduling, rooming patients, conducting examinations, filling and dispensing medications, counseling on medications, setting up patient referrals, ordering labs, and documenting encounters. Teams alternated between the student-run clinic and various satellite sites that included a(n) community pharmacy, pediatrics clinic, retirement community, Planned Parenthood®, women's care clinic, HIV clinic, family practice, and private primary care practice. The separate curricula for P1s and M1s shared similarities in didactic courses such as physiology, pharmacology, and clinical skills. The IPE program has expanded to include first-, second-, and third-year students, with plans to include other professions, including but not limited to nursing, occupational therapy, physical therapy, physician assistant, and social work. In a workshop at the beginning of this program, all students were introduced to the concept of IPE. During this workshop, student teams were asked to develop an action plan focused on how their team would achieve IPE core competencies.

Participant recruitment

All 75 students enrolled in the combined IPE courses were invited via e-mail to voluntarily participate in focus groups. Participants were grouped by profession in order to assess whether their comments varied based on homogenous or mixed group composition. Our initial plan was to run two focus groups per category: P1, M1, and mixed. After completing one focus group per category, we found that themes were consistent across all groups. We felt this saturation of data justified limiting the study to three groups.[19]

Data collection

Focus groups were conducted towards the end of the semester after teams had rotated through the student-run clinic at least ten times. Before each focus group was held, written consent was obtained from all participants and the participants were informed of the purpose of the research. A moderator unaffiliated with the combined IPE courses conducted the focus groups. Each participant was asked to create a pseudonym to allow them to speak freely, knowing that only a transcript with pseudonyms would be seen by the investigators. The moderator used a semi-structured topic guide to conduct focus group discussions. A literature search was conducted to derive questions for the focus group topic guide. The topic guide was pilot-tested on a group of pharmacy students from USciences who participated in a different interprofessional activity not associated with this program. Following revisions, the topic guide included the following domains: (1) values and ethics, (2) roles and responsibilities, (3) interprofessional communication, (4) teams and teamwork, and (5) global impressions. For each domain of the topic guide, there was a series of open-ended questions and more specific "probe" questions to elaborate group discussion (Table 2). All participants completed an anonymous demographic survey. None of the faculty involved with the IPE courses were present at the focus group sessions. On average, the focus group discussions lasted one hour in duration. Food was provided as an incentive for participation. Discussions were audio-recorded and transcribed verbatim.

Data Analysis

Verbatim transcripts from the focus groups were uploaded into MAXQDA 11™ (2012, VERBI GmbH, Berlin, Germany) for qualitative thematic analysis. This approach allows for identification of themes in data through user-driven coding and user identification of patterns or constellations of similar data.[18,20,21] Passages of text were isolated for coding based on both *a priori* codes and codes that "emerged from the data."[21] As a functionality of MAXQDA 11™, definitions and instructions for applying unique codes were provided for both *a priori* and emergent codes to ensure inter-coder reliability. To increase internal validity, two coders independently coded the transcripts. First,

Table 2
Example questions from focus group topic guide

Domain	Open-ended questions	Probe questions
Values and ethics	Describe an ethical dilemma that you encountered during this IPE experience and how you resolved it.	Do you feel that all health care professionals share the same values and ethics?
Roles and responsibilities	Describe your own role and responsibilities within your team.	Were roles adequately overlapped among team members?
Interprofessional communication	Describe how you communicated and shared information with other team members.	Did you use terminology that all members of the team could understand?
Teams and teamwork	Describe a time when your team had a conflict or challenge.	How was the conflict resolved?
Global impressions	Describe experiences that stand out in your mind that have changed your perceptions about health care.	Can you think of another experience that would give you this same exposure?

IPE = interprofessional education.

the coders read the transcripts for overall comprehension prior to coding. This helped identify emergent themes without losing the connections between concepts and their context.[21] After the initial reading, coders re-read and assigned *a priori* codes, which were partially derived from the focus group topic guide questions. Next, the coders met to discuss new concepts that had emerged from the data. New codes for these emergent concepts were consensually developed and applied during a second round of coding. Afterwards, similar codes were grouped together to develop emergent themes. A consensus process was used to crystallize thematic statements. Finally, coders identified key statements that represented examples of the emergent themes (Table 3). Descriptive statistics were used for participant demographics.

Results

Participant demographics

A total of 18 students participated in the three distinct groups, with six students per group. The demographics of the students who participated are presented based on student profession (Table 4). In general, the P1s were younger, had earned only a high school diploma, and had less previous health care experience compared to the M1s.

IPE core competency themes

Values and ethics for interprofessional practice

For this competency, one evident theme was "patient care concerns." All of the students consistently placed the interests of their patients as a top priority. Another theme relating to this competency was "shared feelings" for the other profession of students, specifically feelings of respect, trust, and appreciation.

Roles and responsibilities

For this competency, an emergent theme was a "disconnect between student expectations and actual experiences." Students described situations where their preceptors expected them to have a stronger knowledge base and students felt unprepared and uncomfortable in these situations. Additionally, many students' expectations about how their teams would function within the student-run clinic were different from their actual experiences. Interestingly, P1s and M1s shared the same "perceived role of a pharmacist." Both groups of students had prior experience with the traditional retail pharmacy roles. This perception changed after participating in the IPE clinic; "new learning of pharmacist roles and responsibilities" emerged as a theme when students realized the clinical role of a pharmacist during dispensing functions (e.g., medication counseling) and through pharmacist involvement in non-traditional settings (e.g., HIV clinic).

Interprofessional communication

For this competency, the results were mixed among teams. Some students reported a complete "lack of communication" among team members and attributed this mainly to inconsistent patient scheduling and physical space constraints in patient exam rooms. However, other students described "strategies used for effective communication," such as using e-mail or texting to keep all team members informed.

Teams and teamwork

For this competency, the results were also mixed among teams. Some students described "teamwork" as ensuring that their teams consistently worked together at clinic and away sites; however, others reported that they only interacted with their teams at away sites. There was a lot of teamwork described within the clinic; however, it was not typically within specific teams, but rather with other students or health care professionals. Another evident theme was "shared goals" for patient-centered care that was common among every team and student.

Emergent themes

Differences between P1s and M1s

We identified key emergent themes that differentiated the P1s from the M1s. The first theme was "problem identifiers vs. problem solvers." The P1s were more apt to be problem identifiers, specifically relating to clinic workflow and course concerns, whereas the M1s commented on how to solve the evident problems that arose during clinic. Another differentiating theme we identified was "sinkers vs. swimmers." P1s expressed that they felt like they were floundering and did not feel they had the skills or knowledge to perform certain roles. The P1s wanted more guidance from preceptors. In contrast, the M1s reported that this would be a learning experience that required them to step outside their comfort zone and participate in more experiential learning.

Similarities among P1s and M1s

We identified key emergent themes that were similar for both professions. "New learning about peers" emerged when students discussed that they did not realize that their peers were starting at the same health profession educational level and shared similar classes throughout the first year (e.g., physiology and pharmacology). "Confirmation of career choice" emerged as both P1s and M1s were adamant that they were happy with their respective career choices and would not want to switch. Additionally, for "benefits of IPE program," both groups perceived that this program was a positive and beneficial experience. A popular theme was the complaint of "physical space and time constraints" to perform tasks within the student-run clinic. We also discovered "preceptor issues," specifically, the lack of consistency in preceptors' understanding of IPE. Students reported that some resident and satellite site preceptors were not as aware of the goals of IPE compared to the attending preceptors at the student-run clinic.

Table 3
Emergent themes and supporting statements

Theme	Supporting statements
Values and ethics for interprofessional practice	
Patient care concerns	"We're all there to care for the patient to make sure they get proper treatment and that their health is on track."
	"One of my patients has 9 or 10 medications…I just can't imagine taking all of that…I just try to take a step in their shoes."
Shared feelings	"We value each other because we respect each other."
	"My team members respect me not just as a pharmacy student but just overall as a future health care professional."
Roles and responsibilities	
Disconnect between student expectations and actual experiences	"I (thought) that every time I would see a patient I would be with one of my med students."
	"People expect us to know the drugs and that's what a pharmacist is to everybody, and we don't so it is hard at times for us."
Perceived role of a pharmacist	"I didn't know that there (were) clinical aspects to (pharmacy)…like I guess you picture CVS… it is more than just counting pills."
	"I actually haven't had much interaction with them other than going to pick up prescriptions that were filled for me."
New learning of pharmacist roles and responsibilities	"I met a clinical pharmacist who was educating the entire team…I wondered how does a pharmacist do this and work at CVS."
	"It has opened the field of pharmacy a lot more for me because I know that I'm not limited to certain things."
Interprofessional communication	
Lack of communication	"(We thought we) would be spending a lot of time with (our team), but you don't even see your group (except) you happen to go to the same satellite (site)."
	"For the most part my group gets a patient like, every single one of us, so I can't really assist the other members."
Strategies used for effective communication	"We always keep each other informed like e-mail our notes back and forth."
	"There was a hand-off if the other half of your group was going to see your patient…you let them know all the pertinent information about the patient."
Teams and teamwork	
Teamwork	"Our pharmacy student has definitely been in the room when either one of the medical students has seen patients…if we ever have and questions about any of the prescriptions, she is very knowledgeable about side effects and (drug) interactions."
	"My patient was supposed to come…to pick up meds…and the pharmacy student on my team knew about the meds (which was) communicated to her through the other medical students on my team…it showed me that I could trust the other half of my team."
Differences between P1s and M1s	
Problem identifiers vs. problem solvers	P1s: "It's a really small, tight area within the pharmacy…there's like about 15 rooms that we see patients in…it's a pretty small facility and it would obviously be a lot better if it was bigger."
	M1s: "You better figure it out because everyone else is running around busy too."
Sinkers vs. swimmers	P1s: "I felt like I was floundering." "It is really nerve wrecking."
	M1s: "I'm a big fan of throw me in the water and make me swim." "I think it's a matter of also learning from our peers."
Similarities among P1s and M1s	
New learning about peers	"I mean at first I think we were intimidated by the (medical students), but in reality we all were on the same level…they're just like us."
	"It's really nice to see that we are all on the same knowledge level so I don't think anyone feels beneath anyone there…(For example) 'You're in physiology? I'm in physiology!' We're learning the same things."
Confirmation of career choice	"We got the right career. They should be the ones thinking about switching."
	"Being a medical student and having to work with a pharmacist made me understand why I choose medical school instead of pharmacy…(pharmacy is) way harder than it looks"
Benefits of IPE program	"I feel like it's helpful for when we go on rotations because we will already know how clinics work…we will be more prepared in that aspect…(knowing) how patient care is with the doctors and pharmacists."
	"My other peers that don't get to do this (IPE) program don't get a lot of opportunities…this is like a peek into the future that is going to help you."

Table 3
Continued

Theme	Supporting statements
Physical space and time constraints	"I think the real problem is that they have too many people (at clinic)."
	"It was stressful…the counting…with the computers and space it makes it even more chaotic."
Preceptor issues	"I was at an away site where the doctor kind of said 'you go with the nurse and I'll take the med students and I'll show them this'."
	"The doctor who was at the site was…talking to the medical students the whole time, and I was just standing and smiling."

IPE = interprofessional education; M1s = first-year medical students; P1s = first-professional year pharmacy students.

Homogenous versus mixed profession groups

We did not identify differences in themes between the homogenous and mixed-profession focus groups. P1s and M1s in the mixed focus group discussed similar content as their peers, who participated in each respective homogenous focus group. The mixed focus group participants did not alter their discussions based on the presence of a different profession.

Discussion

Our findings provide evidence that first-professional year pharmacy and medical students are at the beginning stages of acquiring the knowledge, skills, and behaviors needed to achieve the IPE core competencies. The core competency domains are linked with behavioral-based objectives that integrate knowledge, skills, attitudes, and values needed to demonstrate achievement.[8] We found that our students were at the early stages of this learning process and the student-reported experiences aligned with some, but not all, of the objectives within each competency. A majority of the student-reported experiences were those foundational to the core competency domain itself. There were less student-reported experiences for objectives that require students to build upon foundational learning (Table 5). For values and ethics, students' were describing examples of patient-centered care (VE1). Their attitudes and feelings towards each other were those of respect and appreciation, which are critical to foster ongoing interprofessional relationships (VE4 and VE6). Additionally, our students demonstrated cooperation in interprofessional settings (VE5). In contrast, students were not sure how to manage ethical dilemmas since they did not perceive they had experienced any during the experience (VE7 and VE8). For roles and responsibilities, students recognized and felt uncomfortable with their limitations in knowledge and skills (RR2). Their lack of comfort is likely related to the fact that they were first year students who were expected to provide patient care. After misconceptions about each profession were dispelled, students were able to describe and distinguish roles and responsibilities of their interprofessional peers (RR4). Anecdotally, we have observed these students engage other health care professionals to meet specific care needs (e.g., medical student asking a pharmacy student to help with conducting a medication counseling session for a patient on an inhaler) (RR3 and RR9). In contrast, we did not identify that students were engaging in continuous professional and interprofessional development (RR8). This is a higher-level competency objective and not an achievable expectation for first year students. For interprofessional communication, there was a mix of experiences, which is likely attributable to team dynamics and leadership. For example, some teams chose effective tools and techniques to communicate timely patient information (CC1 and CC3), while others struggled with interprofessional communication objectives. Also, because none of the students commented on inter-team conflict, there was a lack of student-reported experiences relating to conflict management (CC6). The lack of student-reported experiences is likely due to the fact that students have limited experience in autonomous decision-making and this may be a high expectation for first year students. However, conflict management is an important objective for all practicing professionals and this finding warrants the addition of simulated learning activities in the form of case scenarios that occur in conjunction with experiential education to supplement the learning experience. For teams and teamwork, similar to interprofessional communication, the mixed experiences were also likely attributed to team dynamics and individual leadership styles. For example, some teams were effective at engaging others within the

Table 4
Demographics of focus group participants

Profession	M1s ($n = 9$) mean (range)	P1s ($n = 9$) mean (range)
Female gender	44%	89%
Age (years)	26 (23–36)	21 (20–23)
Highest degree earned		
High school diploma	0%	100%
Bachelor's degree	78%	0%
Master's degree	22%	0%
Health care work experience	78%	66%

M1s = first year medical students; P1s = first-professional year pharmacy students.

Table 5
IPE core competency achievement for first year medical and pharmacy students

	Specific competency objectives[8a]	
Core competency domain	Student-reported	Not reported
Values and ethics	*VE1*: Place the interests of patients and populations at the center of interprofessional health care delivery.	*VE7*: Demonstrate high standards of ethical conduct and quality of care in one's contributions to team-based care.
	VE4: Respect the unique cultures, values, roles/responsibilities, and expertise of other health professions.	*VE8*: Manage ethical dilemmas specific to interprofessional patient/population-centered care situations.
	VE5: Work in cooperation with those who receive care, those who provide care, and others who contribute to or support the delivery of prevention and health services.	
	VE6: Develop a trusting relationship with patients, families, and other team members.	
Roles and responsibilities	*RR2*: Recognize one's limitations in skills, knowledge, and abilities.	*RR8*: Engage in continuous professional and interprofessional development to enhance team performance.
	RR3: Engage diverse health care professionals who complement one's own professional expertise, as well as associated resources, to develop strategies to meet specific patient care needs.	
	RR4: Explain the roles and responsibilities of other care providers and how the team works together to provide care.	
	RR9: Use unique and complementary abilities of all members of the team to optimize patient care.	
Interprofessional communication	*CC1*: Choose effective communication tools and techniques, including information systems and communication technologies, to facilitate discussions and interactions that enhance team function.	*CC6*: Use respectful language appropriate for a given difficult situation, crucial conversation, or interprofessional conflict.
	CC3: Express one's knowledge and opinions to team members involved in patient care with confidence, clarity, and respect, working to ensure common understanding of information and treatment and care decisions.	
Teams and teamwork	*TT3*: Engage other health professionals—appropriate to the specific care situation—in shared patient-centered problem-solving.	*TT8*: Reflect on individual and team performance for individual, as well as, team performance improvement.
	TT11: Perform effectively on teams and in different team roles in a variety of settings.	*TT9*: Use process improvement strategies to increase the effectiveness of interprofessional teamwork and team-based care.

CC = interprofessional communication competency; IPE = interprofessional education; RR = roles and responsibilities competency; TT = teams and teamwork competency; VE = values and ethics competency.

[a] Competencies listed in this table were selected from IPEC report[8] and are not all inclusive.

student-run clinic to solve patient care problems (TT3 and TT11), while other teams were not for several reasons that include: not having a designated team leader, or having a team leader with poor team-building abilities, or team members lacking mutual support for teamwork. Also, there was no evidence of self-reflection on individual and team performance, and only a few teams incorporated strategies to improve team functionality (TT8 and TT9). This is evidence to suggest the value of including team-building exercises to already existing courses within the curriculum to assist students in developing skills required within their own profession. Overall, these findings support the importance of recognizing that achievement of IPE core competencies is a gradual process, requiring students to build upon knowledge and skills they acquire throughout the experience. Since our combined IPE courses are longitudinal, this design is an appropriate setting to allow for this developmental process to take place. Educators should not expect students to report these experiences after one-day events. With the information that we have gathered from the students' perspective, our findings can inform the curricular planning and assessment framework for the development of

benchmarks and objectives for longitudinal IPE courses with first year students.

Our findings from the emergent themes that differentiated P1s from M1s were likely due to differences in demographics, specifically age, highest level of education, and previous health care work experience. We believe that because the medical students were older, more experienced, and potentially more mature, they were accustomed to solving problems and working outside of their comfort zones. Pharmacy students were at least two years younger and accustomed to educational experiences in which their performance is evaluated using rubrics or other assessment tools with defined criteria. Also, many of them did not have real-world experience of working in health care prior to this course. We saw no evidence that these differences affected interprofessional teamwork. In fact, some medical students viewed "their" pharmacy student as someone who needed nurturing and expressed willingness to take them "under their wing." IPE programs that share similar differences in demographics between students may expect to see these same differentiating themes; however, we do not anticipate this will affect their students' ability to work together. Some of the emergent themes that were similar among P1s and M1s reinforce the value of IPE. When the P1s and M1s learned that they shared similar classes during their first year, this provided a basis for bonding which facilitated interprofessional teamwork. At the same time, both the pharmacy students and medical students were happy with their career choice and felt no desire to switch roles. They appreciated the work done by the other profession, but wanted to remain in their profession.

Our findings also provide evidence of ways to enhance learner experiences. We found that the physical environment can interfere with learning, which may detract from the focus of the learning experience. This has been previously reported in the literature as a barrier to implementation.[5] When developing IPE courses, it is imperative that physical space and personnel requirements are sufficient to provide an optimal learning environment. Additionally, we found that the preceptors involved in the IPE courses must share the same ideals and goals, which is a suggestion of current literature.[5] It is extremely important to ensure that learners are exposed to clinicians who are participating in actual interprofessional collaborative practice settings; however, we discovered this is a challenge in traditional patient care settings. For example, one student described an experience at a satellite site that involved the physician separating a team. The physician took the medical students, while sending the pharmacy student with the nurse, which is clearly not reflective of the collaborative spirit of IPE. Educators must recognize that concepts of IPE may be foreign to some preceptors and provide ongoing development to promote shared goals of IPE. Additionally, it is recommended that IPE be implemented early in the curricula and we found benefits of enrolling our students at the beginning of their professional education.[22] From a behavioral standpoint, a majority of P1s and M1s were unaware of traditional patient care settings that do not incorporate collaborative practice. This was pedagogically useful as we did not have to overcome the barriers of negative stereotyping and/or intergroup discrimination that have been described in other studies.[15,23] However, this can also be a challenge if students perceive that in all practice settings collaborative teams exist and are effective, when in fact, this may not be true. This finding should inform educators about the importance for students to understand that when they enter practice they may have to act as agents of change in some circumstances. These collaborative-ready students may have to re-educate many seasoned practitioners about interprofessional collaborative practice. In addition to the behavioral aspect, from a knowledge standpoint, both P1s and M1s had similar clinical knowledge bases, resulting in an equal initial knowledge status for all participants, despite the choice to pursue different professional paths. This aspect facilitated cooperative student working and learning environments. In fact, we noticed that this finding resulted in a "leveled playing field" in which the P1s, although younger, felt confident in their ability to teach their M1 counterparts didactic topics and physical assessment skills.

Our study is unique from other published studies in multiple aspects. A study conducted by Rosenfield et al. utilized focus groups of students from different professions to elicit information relating to the students' first exposure to IPE; however, the IPE intervention being studied was a one-day event, compared to our 24-week courses. Interestingly, student suggestions from the Rosenfeld study included that IPE should "form a regular, longitudinal part of undergraduate education" and "be well integrated into existing curricula," both of which are characteristics of our combined courses. Most IPE experiences are not required, longitudinal courses and students have deemed these designs as less relevant due to the limited exposure.[16] Also, our study is unique because we utilized focus groups to collect data, allowing us to obtain detailed information that surveys are not typically able to capture.[24] While many studies have quantitatively assessed attitudes and perceptions of IPE, to our knowledge, no other study has sought to qualitatively assess student experiences related to IPE core competencies. One study presented a post hoc comparative analysis of reflections after an IPE intervention to the core competencies and found congruency.[10] Our study reinforces these findings and provides a deeper understanding of students' overall experiences. Ultimately, the findings of our study can be used to develop standards and developmental benchmarks to inform curricular planning. We have proposed expectations in core competency achievement for first year medical and pharmacy students who participate in longitudinal, IPE practice experiences in Table 5. Additionally, evaluation of learners and their experiences can identify gaps and overlaps within the intended curriculum, delivered curriculum, and achieved curriculum which can be used to develop and improve IPE courses.

There were a few limitations to our study. First, our results may not apply to IPE courses with different professions or pharmacy schools that are not direct-entry, six-year

PharmD programs. Also, the lack of faculty development affected some of our students' experiences which may not apply to programs that implement faculty development. Second, our P1s and M1s had obvious demographic differences, and so the differentiating themes that emerged may be related to this factor. Third, the focus group participants' experiences may not reflect those of other students in the program who did not choose to participate; however, from a demographic standpoint, we do feel this sample is representative of our IPE courses. Fourth, our sample size was small, even by the standards of qualitative research. Given the overlap of comments made by the three focus groups of students, we do not believe that additional groups would have provided any more insight.[19] Also, due to low student participation rates and resource limitations, this could not be accomplished. Lastly, the two coders were both pharmacists, which may affect the interpretation of the results. To reduce this bias, both coders discussed themes with the moderator, who was not a pharmacist.

Conclusions

Overall, our findings suggest that first-professional year students are at the beginning stages of acquiring the knowledge, skills, and behaviors needed to work effectively in an interprofessional patient care environment. We believe that IPE programs that share similarities to ours can expect to observe similar IPE core competencies in their students at the end of the first year and should consider integrating related IPE core competency objectives (e.g., team building and conflict management) into already existing didactic or experiential coursework to supplement student learning. Our results support the introduction of IPE early in health profession education, the adoption of a longitudinal course delivery format to allow students to achieve IPE core competencies in a progressive manner, and the incorporation of required faculty development for all practitioners involved. Moreover, even though implementation of IPE has become a standard for many health profession curricula across the country, students should be aware that some practitioners may lack interprofessional core competencies. Learners should anticipate this existing disconnect between "what, how, and with whom" they are learning in school versus "what, how, and with whom" they will practice outside of school. They are a new generation of collaboration-ready providers that will enter the health care workforce equipped with not only the knowledge and skills unique to their own profession, but the core competencies shared by all health care professionals essential for the delivery of true interprofessional patient-centered care.

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