BRIEF

Assessing Self-Perceived Interprofessional Collaborative Competency on Advanced Pharmacy Practice Experiences through Interprofessional Simulations

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Objective. Assess the impact of a required interprofessional (IP) simulation during advanced pharmacy practice experiences (APPEs) on students’ perception of IP collaborative competence.

Methods. Fourth-year pharmacy students completing APPEs were required to participate in one of three IP simulations during the 2016-17 academic year to assess practice-readiness for interprofessional teamwork and collaboration. Pharmacy student self-perception of IP competence was measured by the Interprofessional Collaborative Competencies Attainment Survey (ICCAS), administered in a retrospective pre-test/post-test design. The scores were computed as the mean score across the items of the subscale. The results were analysed using descriptive statistics to obtain an overview of the data. Paired t-tests were used to compare the pre-test and post-test results.

Results. During the 2016-17 academic year, 157 pharmacy students were assigned to complete an IP simulation. The subscales on the ICCAS survey were categorized into communication, collaboration, roles and responsibility, collaborative patient-centered approach, conflict management, and team functioning. All categories achieved a statistically significant difference from baseline to completion of simulation.

Conclusion. Following the IP simulations, students felt competent to engage in IP collaboration and this, along with their performance on APPEs, determined their practice-readiness for IP teamwork.

Keywords: interprofessional, simulation, ICCAS, APPE
INTRODUCTION

Interprofessional education (IPE) is when two or more students from different professions learn about, from, and with each other to support collaboration and improve health outcomes. Interprofessional collaborative practice (IPCP) in healthcare occurs when multiple health professionals from different backgrounds provide comprehensive services by working with patients, their families, caregivers and communities to deliver the highest quality of care across settings. The importance of IPE, IPCP, and teamwork, as it relates to improved patient care and safety, has been recognized since 1972 by the Health and Medicine Division of the National Academies of Sciences, Engineering, and Medicine. Currently there is a gap in literature demonstrating the effect IPE has on patient and health-system outcomes. In order to start addressing those gaps, it must be ensured that students are developing into competent healthcare professionals that can collaborate effectively as a team.

Based on this call to action, the Center for the Advancement of Pharmacy Education (CAPE) outcomes and the Accreditation Council for Pharmacy Education (ACPE) standards have incorporated IPE and IPCP into their guiding documents. CAPE outcomes require that pharmacy school curricula prepare all students to provide entry-level, patient-centered care in a variety of practice settings as a contributing member of an interprofessional (IP) team. Furthermore, ACPE standards require assessment of students’ practice-readiness to collaborate in an interprofessional (IP) team upon graduation.

Initial assessment data from our institution reports that students’ direct interaction with the IP team is highly variable, with some advanced pharmacy practice experiences (APPEs) having ample opportunities and other APPEs having minimal opportunity. Furthermore, our preliminary internal surveys to evaluate IPCP at APPE sites demonstrated even when there is a high level of IP teamwork at a site, often times the team engages directly with the pharmacy preceptor who does most of the IP communication and collaboration. This leaves the student in an observation mode rather than actively contributing to the team. Therefore, incorporation of IP simulations into the experiential curriculum
provides pharmacy students a standardized and authentic opportunity to work with students in other healthcare professions as a team.

Studies have demonstrated increased confidence in students’ perceived IP competence after completing a team based simulation. Kostoff, et al. showed an increase in early pharmacy student’s self-perceived competence and attitude towards interprofessional collaboration after completing a simulation with nursing students. Similarly, Gellis, et al. demonstrated a more positive attitude towards healthcare teams, greater self-efficacy and IP competency post simulation. Romito, et al. developed a learning activity where interprofessional, non-pharmacy, students participated in an IP simulated patient case to allow the teams to further practice their IP communication and teamwork skills. Their perceived competency was measured pre-/post-experience using the Interprofessional Collaborative Competencies Attainment Survey (ICCAS) which yielded statistically significant positive changes on all subscales. However, evaluation of standardized simulations to engage in IPCP and assessment of perceived collaborative competency during APPEs is lacking in the literature.

The purpose of this study was to determine the impact of participation in an IP simulation during APPEs to serve as standardized exposure to IP collaboration, and to measure students’ readiness to collaborate as an interprofessional team member upon graduation utilizing the ICCAS.

METHODS

The University of Kansas (KU) offers a four-year doctor of pharmacy (PharmD) degree to approximately 140-160 students per class and is the only school of pharmacy in the state of Kansas. The students are divided between two campuses, with the majority of students (120-140) located on the main campus in Lawrence and the remaining students (20) on the Wichita campus. Both campuses have access to collaborate with students from multiple healthcare professions (both prescribers and non-prescribers) and opportunities to complete APPEs in a variety of pharmacy practice settings across the state. Additionally, as part of the IP curriculum, all students participate in TeamSTEPPS® program Level 1 and Level 2 during their first and second year of pharmacy school as early IP experiences.
The final year of the KU PharmD program is spent learning through APPEs. These APPEs consist of nine one-month blocks of 160 contact hours each in various health care settings. Such practice settings may include acute care, ambulatory care, community pharmacy, institutional pharmacy, managed care, specialty pharmacy, academia, and pharmaceutical industry. Each APPE provides an academically structured environment that enables the student to gain practical experience under the guidance of a practicing pharmacist or designated healthcare professional preceptor. During these APPEs, students are required to meet and document a variety of requirements, one of which is being an active IP team member. According to internal survey data, this requirement varied widely for each student and there was not a consistent approach to how much exposure and interaction students were getting during their APPEs. Thus we incorporated the requirement of completing a standardized IP simulation to address this concern and provide a minimum opportunity of consistent exposure for students in conjunction with their practice-based APPE activities.

Fourth-year pharmacy students completing APPEs during the 2016-17 academic year were required to participate in one of three IP simulations. Summaries of the IP patient case scenarios are described further in Figure 1. The three simulations included standardized patient actors who were trained prior to participating in the simulation. Three simulations were included to ease scheduling and other logistical factors encountered when collaborating with other health professional schools. For example, in the nursing school an annual offering of a primary care simulation was needed but could not accommodate all of the pharmacy students due to a mismatch in student numbers. Therefore, offering all three simulations longitudinally throughout the year provided the correct number of simulations for the pharmacy students to participate in one simulation and allowed our collaborators to meet their specific needs as well. All three simulations provided an opportunity for each pharmacy student to collaborate with at least one student prescriber from the school of medicine or physician assistant, along with nursing, dental hygiene, and/or physical therapy, in varying levels. All the simulations included about 20-30 minutes of preparation work before the simulation to review expectations, key clinical concepts, and set student expectations that the simulation was focused on their teamwork and collaboration skills. For two of the simulations, students were required to complete the prework independently via a podcast prior to the simulation. For the third simulation,
students received this information in an interprofessional discussion prior to starting the simulation. After each simulation, students participated in a faculty-led debrief focused on teamwork and collaboration.

Following the IP simulations, the pharmacy students’ self-perception of interprofessional competence was measured by the psychometrically validated ICCAS, administered in a retrospective pre-test/post-test design. The ICCAS validation study included over 15 different institutions that utilized the survey in a variety of IPE experiences and included both trainees and healthcare professionals, making it widely applicable to a variety of professions and experiences. The ICCAS contains 20 measures on a 7-point Likert scale from strongly disagree to strongly agree which yield six subscale scores. The ICASS subscales reflect the widely accepted interprofessional education collaborative core competencies for practice. The six subscales included in the ICCAS are: communication, collaboration, roles and responsibility, collaborative patient-centered approach, conflict management, and team functioning. The ICCAS requires that learners reflect and self-assess their level of competency prior to and following completion of an IP simulation using the ICCAS survey. The ICCAS is emerging as a preferred IPE survey instrument as evidenced by the National Center for Interprofessional Practice and Education recommending it as one of 50 best practice recommendations. Immediately after the simulation, students were provided a link to complete the survey electronically using REDcap 8.1.20 electronic data capture tools hosted at the University of Kansas. The survey was identified and students were required to complete it in order to receive credit.

The quantitative survey was analyzed using descriptive statistics to obtain an overview of the data using Microsoft Excel (version 15.39 computer software). Paired t-tests were then used to compare the pre-test and post-test results using SPSS (version 22 computer software). This study was approved by the University of Kansas institutional review board (#STUDY00140041).

RESULTS

During the 2016-17 academic year, 157 APPE pharmacy students were assigned to complete an IP simulation. One hundred fifty students (95.5% response rate) completed the ICCAS. The
subscale means were compared from baseline to completion of the simulation. The breakdown of each subscale and their scores are provided in Table 1.

All subscales achieved statistical differences and improved from baseline to completion of simulation (p<0.001). All individual measures within each subscale also achieved statistical significance as demonstrated in Table 1. The greatest change was observed in the *address* measure of the subscale collaboration with a pre to post score of 5.70 to 6.47 respectively. The *address* measure assessed student’s perceived competency in seeking out IP team members to address issues. There was a similar improvement in the *plan* measure of the team functioning subscale with a pre to post score of 5.80 to 6.57 respectively. The *plan* measure assessed student’s perceived competency in developing an effective patient care plan with IP team members. The *feedback* and *responsibility* measures had the lowest pre-simulation scores at 5.47 and 5.59 respectively.

**DISCUSSION**

In an effort to achieve accreditation standards and ultimately provide safe and effective patient care, all students must be prepared to provide entry-level, patient-centered care in a variety of practice settings as a competent member of an IP team. Our study showed similar results to Romito’s and Kostoff’s studies, further demonstrating a positive impact on students self-perceived competency in all domains of the ICCAS after participating in an IP simulation. However these studies had a low response rate and minimal pharmacy student participation. Despite previous literature focused on interventions that demonstrate student perceived IP growth, a study that specifically assessed pharmacy students IP competency during APPEs is missing in the literature. We designed this study using the ICCAS to determine the impact of IP simulations during APPEs (as a means for standardized exposure to IP collaboration) on pharmacy students’ self-perception of their IP competence.

Our study adds many strengths to the current literature. IP simulations provided standardized and guaranteed opportunities for pharmacy students to participate as part of the IP team. This can enhance pharmacy students’ confidence in IP competency across the IP skill areas during APPEs prior to graduation. The simulations also included various healthcare professionals within a patient care
team to provide a broad understanding of the skillset of different health care professionals, and in turn prepared them for their practical IP experiences upon graduation. A high response rate (95.5%) provided an accurate depiction of the results and prevented any significant non-response bias. Though the IP simulation and ICCAS completion was required to receive credit, as this was the first year implementing this process the seven students who did not complete the ICCAS did not receive any repercussions. A change moving forward is to be more strict with these requirements.

A major limitation of the study was the varying level of IP clinical experiences that students may have been exposed to during their APPEs prior to participating in the IP simulation. Students participated in their assigned simulation in cohorts throughout their final year of pharmacy school which led to varying levels of experiences prior to completing the simulation, dependent on if they completed the simulation earlier versus later in the academic APPE year. Another limitation is that ICCAS is a self-rated scale which could result in over- or under-estimation of the student’s self-perceived IP collaborative competencies. However, the ICCAS is validated and a widely accepted assessment tool for IPE as mentioned earlier. Despite ICCAS not being utilized with pharmacy students during their APPEs prior to this study, it has been validated with healthcare trainees and established healthcare professionals in a variety of IPE experiences making it applicable to this study. Additionally, ICCAS is now being used to assess competence after being immersed in interprofessional practice-based settings as well. The retrospective pre-post design can present with bias associated with social desirability, effort justification and cognitive dissonance which may have impacted the results. Moreover, the varying level of education of students from other professional schools could have also had an effect on the accuracy of the results. Lastly, there were no internal comparisons of the different simulations to determine if a difference existed between the three simulations.

There were challenges faced with coordinating each of these simulations as multiple professions were included, all with varying schedules and at different time-points in their curriculum. Advanced planning with all professions involved helped to overcome these challenges. Due to some of these limitations, especially having students miss a few hours of one of their APPEs to complete the simulation, changes were made to address these concerns. The largest change was to move the IP
simulations to P3 year as they are easier to schedule during the didactic curriculum. In addition, student feedback also agreed they desired to participate in these simulations prior to starting APPEs. While the simulations during APPEs did serve as a method for ensuring consistent IP exposure, we have found alternative ways to improve this during practice-based APPEs. The two most impactful methods to enhance exposure to IP collaboration include completing their acute care rotation only on hospital services that have IP rounds and providing preceptor development regarding intentional IP collaboration. The IP simulations now serve as a measure of students competence for pre-APPE team-readiness. Future areas of research include determining if there are differences in ICCAS scores between the different simulations and determining the impact of enhancing practice-based experiences for more intentional IP exposure using the ICCAS instrument. Finally, addressing the domains with the lowest scores, which included feedback and responsibility, by incorporating more opportunities to practice those interprofessional collaboration skills earlier in the IPE curriculum.

CONCLUSION

After participating in an IP simulation during the APPE curriculum, students demonstrated a significant improvement in their self-reported attainment of IP competencies. Utilizing an IP simulation during APPEs may be considered especially if there is concern about all students being exposed to intentional IP collaboration during their rotations.

REFERENCES


Figure 1: Simulation case description

**Emergency Department Case**

**Case Scenario:** An 80-year-old patient presents to the emergency department with their grandchild who is not their usual caregiver. The grandchild reports a two-day history of concerns with increased confusion and agitation. The patient has a medical history of treated dementia, depression, and constipation.

**Professions Involved:** Medical, Nursing, and Pharmacy students

**Time:** 2 hours, 45 minutes which included 2 cycles of the case with two different standardized patients and team members. The cycle included 15 minutes of a team huddle, 30 minutes in the simulation, and 30 minutes in a team debrief.

**Debriefers:** One interprofessional faculty from either medicine, nursing, or pharmacy observed the team’s simulation and facilitated the debrief.

**Primary Care Case**

**Case Scenario:** A 55-year-old patient presents to establish care after recently moving and obtaining a job where health insurance is provided. The patient reports non-adherence to their prescribed diabetes regimen due to adverse reactions, poor understanding of the disease, lack of awareness of self-management, and cost and insurance concerns.

**Professions Involved:** Medicine, Nursing, and Pharmacy students

**Time:** 1.5 hours, 10 minute introduction, 20 minute pre-visit huddle, 20 minute patient encounter, 30 minute debrief, 10 minutes wrap-up

**Debriefers:** One interprofessional faculty from either medicine, nursing, or pharmacy observed the team’s simulation and facilitated the debrief.

**Primary Care- Transitions of Care Case**

**Case Scenario:** A 52-year-old patient who is a homeless veteran presents to establish care, brought in by their nephew. The patient also suffers from alcohol use disorder and has not been seen by a medical provider for at least 10 years. The patient’s main concern is hip and knee pain.

**Professions Involved:** Medicine, Nursing, Pharmacy, Dental Hygiene, Physical Therapy, and Physician Assistant students

**Time:** 3 hours which includes 30 minutes of pre-work, followed by three different 20 minute case-scenarios involving the same patient, with three 15 minute debriefs between each scenario, and ending with a 30 minute overall debrief.

**Debriefers:** One to four interprofessional faculty members from either medicine, nursing, dental hygiene or pharmacy observed the team’s simulation and facilitated the debrief.
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* Paired t-test was used to determine significance, defined as <0.05, between students’ pre-simulation score and post-simulation score

Pre Score = Mean pre simulation score of 155 students that completed the survey

Post Score = Mean post simulation score of 155 students who completed the survey

Pre and Post score were measured on a 1 to 7 scale where 1 was strongly disagree and 7 was strongly agree