



## Evaluation of team communication in an interprofessional inpatient transition of care simulation



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### ABSTRACT

**Background:** Interprofessional education (IPE) provides unique opportunities for students to better understand their roles, roles of other healthcare professionals, and prepare for teamwork for patient benefit. Interprofessional team education is recognized as a key element in the 2016 ACPE standards.

**Objective:** Assess student self-perceived competence in four IPEC domains after an inpatient simulation activity.

**Methods:** Pre/post-test design used the Interprofessional Education Collaborative Competency Survey. The activity included medical, nursing, social work, and pharmacy students working in healthcare teams to develop collaborative treatment plans for simulated patients with altered mental status.

**Results:** Ninety-seven health profession students completed the activity, while 49 second-year (P2) student pharmacists participated in the study. All completed a pre-test and 47/49 (96%) completed a post-test. At pre-test, students ranked themselves highest in abilities to respect patient privacy (100% strongly agree) and acting with honesty and integrity in relationships (100% strongly agree). They reported lower ability in describing team development process. At post-test, significant increases were seen in managing ethical dilemmas ( $p < .002$ ) and respect ( $p = .49$ ), though decreases were seen in using appropriate or respectful language ( $p < .02$ ).

**Conclusion:** Significant differences in student perceptions of ethics and communication were observed after participation in a transition of care inpatient IPE simulation.

### 1. Introduction

The World Health Organization defines interprofessional education (IPE) as an act in which “students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes.”<sup>1</sup> Skills in teamwork and communication have been increasingly valued by accreditation bodies, including the Accreditation Council on Pharmacy Education<sup>2</sup> and the Commission on Collegiate Nursing Education.<sup>3</sup> The National Academy of Medicine also recognizes the value of IPE for learners and recommends evaluating the impact of IPE on collaborative practice within teams.<sup>4</sup>

IPE provides learning opportunities for students to better understand their roles, the roles of other healthcare professionals, and to prepare to work on a team for the benefit of the patient. The Interprofessional Education Collaborative (IPEC) maps activities to four core competencies: values/ethics, roles/responsibilities, interprofessional communication, and teams/teamwork.<sup>1</sup> IPE initiatives also provide an environment that is conducive to learning and facilitates effective communication between healthcare professionals. Moreover, participation in IPE activities provides health profession students with unique learning opportunities to further develop

important communication skills such as listening, respecting the opinions of others and conflict resolution.<sup>5</sup>

This project utilized an IPE activity that encouraged face to face interaction and communication during an inpatient shift-change scenario in which student pharmacists were required to communicate with medical, nursing and social work students. Hand-offs such as shift-changes were chosen for this activity as they are a significant risk factor for medical errors and patient safety events. Poor communication contributes to up to two-thirds of sentinel events, and of those, over half are related specifically to poor transition of patient care between providers.<sup>6,7</sup> The IPE activity was designed as a teamwork experience to provide student pharmacists the opportunity to participate in an experiential educational activity with other health profession students to develop a more comprehensive approach to patient care. The objective of this project was to assess student pharmacists self-perceived competence in all four IPE domains after an inpatient simulation activity.

### 2. Methods

This project utilized a cross-sectional, self-administered paper survey, which was implemented at one school of pharmacy during September

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2019. Forty-nine second-year professional student pharmacists (P2) who were enrolled in the Patient/Professional Interactions course participated in the study. Participation in the project was completely voluntary. The study was approved as exempt by the Institutional Review Board at the University of Wyoming.

A pre/post-test design with the Interprofessional Education Collaborative Competency Survey (IPEC-CS) was utilized. The IPEC-CS is a 42-item self-assessment questionnaire designed for health profession students to rate their abilities on each competency of the IPEC domains using a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The IPEC-CS was created to assess competencies related to collaborative practice at the healthcare professional degree program level.<sup>8,9</sup> More specifically, it provides a measure of students' self-efficacy for items that were developed by the Interprofessional Education Collaborative.<sup>1</sup> This organization is a consortium of professional associations in the United States representing six disciplines (Nursing, Osteopathic Medicine, Public Health, Pharmacy, Dental Education, and Medical Schools/Colleges).<sup>1</sup> A copy of the IPEC-CS questionnaire is included as [Appendix A](#).

The first communication lab of the semester, held in early September, was the IPE activity. The P2 student pharmacists participated in an hour-long IPE activity with medical students, nursing students and social work students working in interprofessional healthcare teams to develop collaborative treatment plans for simulated patients with altered mental status. There were four interprofessional healthcare teams that participated in the IPE activity. Each team was comprised of approximately 12–13 student pharmacists, five medical students, three to four nursing students and one to three social work students.

The hour-long IPE activity was divided into two 30-min simulated patient cases: the first was a patient with delirium and the second was a patient with hypertensive emergency. Each patient case/scenario was briefly presented by a Medical Education faculty member to the healthcare teams at the beginning of the IPE activity.

The teams were provided a brief background on the patient, their presenting symptoms, and any interventions, assessments, and/or tests that had been conducted prior to the shift-change. Each healthcare team was divided in half so that approximately 10–12 students were called at one time to participate; the team was then allotted approximately 10 min to consult/ collaborate in order to design a treatment plan and/or order further tests/ assessments for the patient. A second round of shift-changes occurred during each of the two patient cases so that all participating healthcare students had the opportunity to fully participate in the IPE activity.

Two community volunteers role-played the patient for each of these scenarios. Students could fully interact with as well as examine the patient. For the patient with delirium, students were asked to identify drug and non-drug contributors to delirium, communicate with the patient and their family as a team, and discuss non-pharmacologic management strategies. For the patient with hypertensive emergency, students were asked to recognize the hypertensive emergency, and then identify barriers to adherence and other contributors, and to collaborate with other health profession students on a treatment plan.

Descriptive statistics were used to analyze the data. Fisher's exact-test was used to analyze categorical data due to small sample sizes. Paired *t*-tests were then used to compare the pre- and post-intervention test results. An a-priori *p*-value of < 0.05 was considered significant. All statistical analyses were performed using Microsoft Excel (Version 16.38).

### 3. Results

A total of 97 health profession students completed the activity, while 49 second-year (P2) student pharmacists participated in the study. Response rates were very high - 49/49 (100%) with all P2 students completing the pre-test and 47/49 (96%) completed the post-test. Key results are presented below; all results are available in [Appendix A](#).

At pre-test, students ranked themselves highest in their abilities to respect the privacy of patients (100% strongly agreed, median = 5) and to act with honesty and integrity in relationships (100% strongly agreed,

median = 5). The lowest pre-test scores were in describing the process of team development (10% strongly agreed, median 3.5). [Table 1](#) describes the highest overall ratings in similar areas between pre- and post-test.

At post-test, significant differences were seen in the areas of managing ethical dilemmas ( $p < .002$ ) and using appropriate or respectful language ( $p < .02$ ). Additionally, student perceptions regarding the statement that describes respect of the unique value of other health professions also significantly differed before and after the intervention ( $p = .049$ ). The direction of change for the areas of respect and ethics was positive with an increase in both the percentage of students who agreed with the statement and the level of their agreement. The direction of change for the area of language was a decrease from pre-test to post-test. Results with the most substantial changes can be seen in [Fig. 1](#).

Of the four domains of the IPEC-CS, two significant findings were identified in the Values and Ethics domain and one significant finding was identified in the Interprofessional Communication domain. There were no significant differences within the Roles and Responsibilities Domain or in the Teams and Teamwork Domain. Other responses were not significantly different ([Appendix A](#)).

### 4. Discussion

In order to graduate as collaboration-ready practitioners, students require opportunities to practice communication and teamwork skills.<sup>2</sup> Simulation allows students to perform these skills in an environment with patient populations and disease states that remain consistent. The transition of care inpatient IPE simulation evaluated in this study encouraged face to face interaction and communication in a shift-change scenario in which student pharmacists communicated with medical, nursing, and social work students. Though simulations are used frequently in health professions education, our study is noteworthy in that it focuses on hand-offs in the acute care setting.

A study by Baumgartner and colleagues described implementation of acute care simulations. These simulations had strong inter-rater reliability and predictive validity. The authors recommended that other researchers develop acute care simulations and evaluate them with a validated assessment, both of which were a focus in this study.<sup>10</sup>

Student pharmacists' self-perceived competence in each of the four IPEC domains after an inpatient simulation activity was assessed. As the activity focused on communication and teamwork, we anticipated a change in responses in these areas. At post-test, significant increases for student perceptions of ethics and respect for other professions were observed. Students consistently ranked their abilities highly in respecting patient privacy.

A significant difference was observed for the IPEC competency of values and ethics: managing "ethical dilemmas specific to interprofessional patient centered care situations." Though there are evaluative studies of IPE activities using comprehensive assessments, we were unable to identify any that specifically assess ethics in IPE activities with student pharmacists. A recent study involving nursing, midwifery, and law students received positive feedback from students and demonstrated an increase in knowledge and engagement in the area of healthcare ethics.<sup>11</sup> Though the cases did not specifically focus on ethics, reflection on the roles of value and ethics in a healthcare team scenario may have contributed to these results. Significant

**Table 1**  
IPEC Survey Areas with Highest Ranking of Responses.

IPEC Item Focus Area	Median Response (1–5)	Strongly Agree + Agree (%)
<i>Pre-test</i>		
Privacy/Confidentiality	5	98.0
Honesty/Integrity	5	98.0
Patient-Centered Care	4	95.9
<i>Post-test</i>		
Privacy/Confidentiality	5	97.9
Honesty/Integrity	5	95.7
Respect	4	95.7

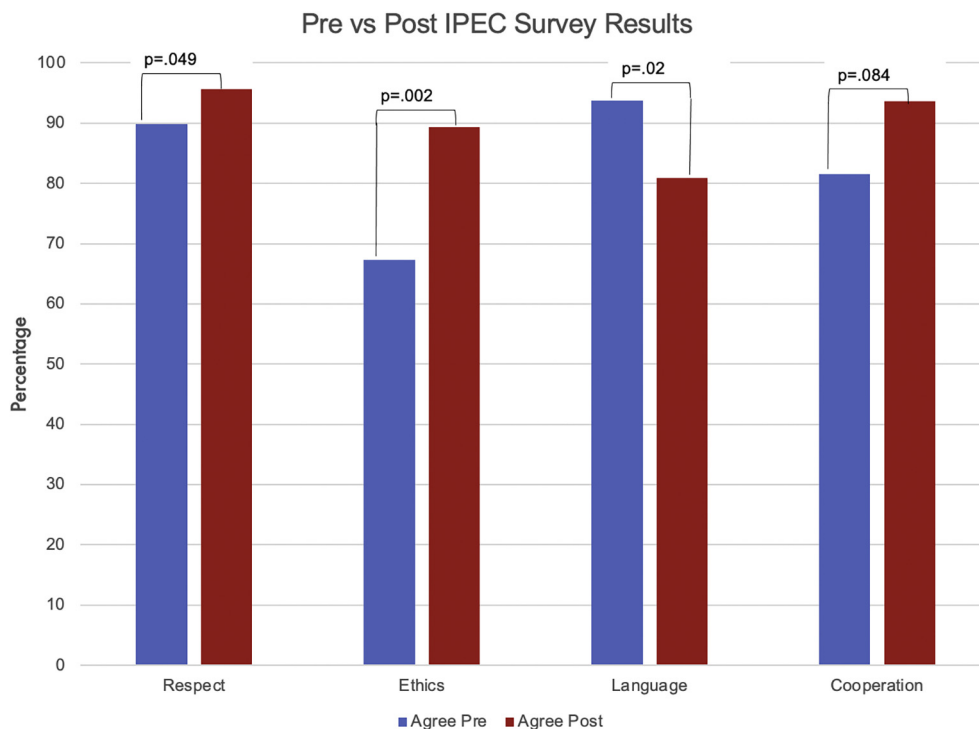


Fig. 1. IPEC Survey Pre & Post Survey (Responses of Agree + Strongly Agree).

increases in student ability to manage ethical situations will be beneficial for subsequent performance on an interdisciplinary team.

Students also ranked their ability to respect the unique role of other health professions significantly higher after this experience; “Respect the unique cultures, values, roles/responsibilities, and expertise of other health professions”. An increase in the area of respecting team members is consistent with a recent study by Southall, et al. After a simulated IPE experience, students reported significantly higher agreement that respect was needed in order for small groups of students to work well together.<sup>12</sup> By having this IPE experience, students may have learned more about the role of other health professions and as such, their level of respect increased. Increases in mutual respect among health profession students have been identified as benefits of IPE experiences in other settings.<sup>13</sup>

It is unclear why the ranking of the statement on language decreased from pre-test to post-test. It is possible that the simulation experience may have led to student self-reflection in their communication skills, since it was part of the core pharmacy communication course. Teams may also have differed in the amount of conflict that occurred, so the results may be heterogeneous. Language may be a challenging skill to address in IPE activities. A similar study also found that language was the primary area that did not significantly change after an IPE experience.<sup>14</sup>

## 5. Limitations

This study utilized a convenience sample of health profession students, which limits the external generalizability. This study only evaluated second-year student pharmacist perceptions of their abilities in each IPE domain after two different inpatient simulation activities. Data from other health profession students were not collected, which limits the evaluation of this activity regarding its usefulness and applicability. This was P2 students first time participating in an IPE activity of this nature. Hence, their responses may have been influenced by their level of exposure to IPE activities. Interactions within a team on a subsequent activity may result in different behavior and attitudes

than those reflected in self-perceived abilities. Student participants did not have the opportunity to collaborate on other disease states. There is the potential for social desirability bias in these data since this activity was evaluated during a required pharmacy course.

The generalizability of the study results is limited since all interprofessional healthcare team participants were students at one College of Health Sciences. The IPE activity was of short duration. Students engaging in IPE activities for longer durations may have had different perspectives regarding their abilities in each IPE domain.

## 6. Conclusion

Significant differences in student pharmacist perception of ethics and communication were observed after participation in a transition of care inpatient IPE simulation. The results of this study provide a framework for additional quantitative research in IPE activities among student pharmacists and other health profession students. Future work is needed to further validate and extend these findings.

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## Declaration of Competing Interest

The authors have no conflicts of interest to report.

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**Appendix A. Interprofessional Education Collaborative (IPEC) Competency Survey Results**

<i>Using a 5 point scale, (1 = strongly disagree and 5 = strongly agree), please rate the items based on your educational experience. I am able to...</i>	Pre Median, (Range)	Post Median, (Range)	P-value (t-test)
<b>Values and Ethics Domain</b>			
Place the interests of patients at the center of interprofessional health care delivery.	4, (3–5)	4, (2–5)	0.7866
Respect the privacy of patients while maintaining confidentiality in the delivery of team-based care.	5, (3–5)	5, (3–5)	0.9969
Embrace the diversity that characterizes patients and the health care team.	4, (3–5)	4, (2–5)	0.3143
Respect the unique cultures, values, roles/responsibilities, and expertise of other health professions.	4, (3–5)	4, (3–5)	0.0496 <sup>†</sup>
Work in cooperation with those who receive care and those who provide support or care.	4, (3–5)	4, (2–5)	0.0846
Develop a trusting relationship with patients, families and other team members.	4, (3–5)	4, (3–5)	0.4793
Demonstrate high standards of ethical conduct and quality of care in my contributions to team-based care.	4, (3–5)	4, (3–5)	0.5494
Manage ethical dilemmas specific to interprofessional patient centered care situations.	4, (2–5)	4, (3–5)	0.0024 <sup>†</sup>
Act with honesty and integrity in relationships with patients, families, and other team members.	5, (3–5)	5, (3–5)	0.5830
Maintain competence in my own profession appropriate to my scope of practice or level or training.	4, (2–5)	4, (1–5)	0.1991
<b>Roles and Responsibilities Domain</b>			
Communicate my roles and responsibilities clearly to patients, families, and other professionals.	4, (2–5)	4, (1–5)	0.5132
Recognize my limitations in skills, knowledge, and abilities.	4, (2–5)	4, (1–5)	0.5757
Engage diverse healthcare professionals with complementary professional expertise to develop strategies to meet specific patient care needs.	4, (3–5)	4, (1–5)	0.9870
Explain the roles and responsibilities of other care providers and how the team works together to provide care.	4, (2–5)	4, (1–5)	0.1115
Use the full scope of knowledge, skills, and abilities of available health professionals and healthcare workers to provide care that is safe, timely, efficient, effective, and equitable.	4, (2–5)	4, (1–5)	0.4671
Communicate with team members to clarify each member's responsibility in executing components of a treatment plan or public health intervention.	4, (2–5)	4, (1–5)	0.9252
Establish interprofessional relationships to improve care and advance learning.	4, (3–5)	4, (1–5)	0.4570
Engage in continuous professional and interprofessional development to enhance team performance.	4, (3–5)	4, (1–5)	0.5287
Use unique and complementary abilities of all members of the team to optimize patient care.	4, (3–5)	4, (1–5)	0.6282
<b>Interprofessional Communication Domain</b>			
Choose effective communication tools and techniques to facilitate discussions and interactions that enhance team function.	4, (3–5)	4, (1–5)	0.9836
Communicate information with patients, families, and healthcare team members in a form that is understandable.	4, (3–5)	4, (1–5)	0.5138
Avoid discipline-specific terminology when possible.	4, (2–5)	4, (1–5)	0.3153
Express my knowledge and opinions to team members involved in patient care with clarity and respect.	4, (2–5)	4, (1–5)	0.5097
Listen actively and encourage ideas and opinions of other team members.	4, (3–5)	4, (1–5)	0.8848
Give timely, sensitive feedback to others about their performance on the team.	4, (2–5)	4, (1–5)	0.6390
Respond respectfully to feedback from others on my healthcare team.	4, (2–5)	4, (1–5)	0.8878
Use appropriate, respectful language in a given	4, (3–5)	4, (1–5)	0.0210 <sup>†</sup>

(continued)

<i>Using a 5 point scale, (1 = strongly disagree and 5 = strongly agree), please rate the items based on your educational experience. I am able to...</i>	Pre Median, (Range)	Post Median, (Range)	P-value (t-test)
difficult situation such as interprofessional conflict.			
Recognize how my experience and expertise contributes to communication, conflict resolution, and interprofessional working relationships.	4, (2–5)	4, (1–5)	0.7967
Recognize how my position in the hierarchy of the healthcare team, contributes to communication, conflict resolution, and interprofessional working relationships.	4, (2–5)	4, (1–5)	0.7042
Consistently communicate the importance of teamwork in patient-centered and community-focused care.	4, (2–5)	4, (1–5)	0.9892
<b>Teams and Teamwork Domain</b>			
Describe the process of team development.	4, (2–5)	4, (1–5)	0.2359
Describe the roles and practices of effective healthcare teams.	4, (3–5)	4, (1–5)	0.4473
Engage other health professionals in shared problem-solving appropriate to the specific care situation.	4, (2–5)	4, (1–5)	0.7919
Inform care decisions by integrating the knowledge and experience of other professions appropriate to clinical situation	4, (3–5)	4, (1–5)	0.5657
Apply leadership practices that support collaborative practice and team effectiveness.	4, (3–5)	4, (1–5)	0.3940
Engage others to constructively manage disagreements that arise between healthcare professionals, patients, and families.	4, (2–5)	4, (1–5)	0.6140
Share accountability with other professions, patients, and communities for outcomes relevant to prevention and health care.	4, (3–5)	4, (1–5)	0.5372
Reflect on my individual performance for my improvement.	4, (3–5)	4, (1–5)	0.6065
Reflect on my healthcare team's performance for my team's improvement.	4, (3–5)	4, (1–5)	0.7014
Use strategies that will improve the effectiveness of interprofessional teamwork and team-based care.	4, (2–5)	4, (1–5)	0.7190
Use available evidence to inform effective teamwork and team-based practices.	4, (3–5)	4, (1–5)	0.8957
Perform effectively on teams and in different team roles in a variety of settings.	4, (3–5)	4, (1–5)	0.7026

<sup>†</sup> *p* < .05 for the difference between the pre- and post-survey responses.

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