What participants learn, with, from and about each other during interprofessional education encounters: A qualitative analysis

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ABSTRACT

Background: Safe healthcare requires teamwork and collaboration. To meet the needs of healthcare organizations and professionals, inter-professional education, is no longer an optional educational trend but rather a mandate of accrediting health education agencies.

Objective: In an effort to better understand the impact of inter-professional educational activities, this study sought to explore via qualitative methods what nursing and medical students learn with, from, and about one another during a week-long, inter-professional, simulation-based patient safety course.

Design: A convenience sample of post-course survey responses from students participating in a week-long, inter-professional, simulation-based patient safety course was used to longitudinally explore what participants learn with, from, and about each other.

Settings: The setting for this study was a research university located in the southeast United States.

Participants: The participants included a total of 272 second semester accelerated option Bachelor of Nursing students and 599 medical students entering the 3rd year of their program that participated in an annual patient safety course. The study analyzed responses of students to questions in a post-course survey regarding educational outcomes while learning with students from a different profession.

Results: In the responses from 871 students collected over four years, the following key themes emerged. Students: 1) articulated learning the importance of contributions of other professions to the healthcare team, 2) expressed an appreciation for areas where their colleagues’ training was superior to their own; and 3) identified deficiencies in their own knowledge and skill sets.

Conclusion: The findings of this study provide a basis for developing more specific curricular content as part of inter-professional education endeavors to strengthen constructive views of healthcare professions, foster a more collaborative shared mental model, and to correct perceived misconceptions.

1. Introduction

The delivery of safe and efficient health care requires teamwork and collaboration. Traditionally healthcare providers have been educated and often worked in silos within their own discipline. A silo mentality of education and practice negates opportunities to understand the roles and contributions of all health care providers. In addition, silo practice does not allow health care providers opportunities to collaborate in the provision of safe high quality patient care (Sullivan et al., 2015). Today, the complexity of healthcare systems, coupled with an aging and sicker population (Cuff and IOM, 2013), makes collaboration not only a necessity, but an imperative.

Poor communication among healthcare providers and ineffective leadership has been identified as significant contributing factors in the commission of errors (Nether, 2017). Charles, et al., 2010 assert that in turn, healthcare education has had to pivot to meet the needs of healthcare organizations and in order to graduate healthcare professionals ready and willing to work in teams. Inter-professional education (IPE), defined as an optional educational activity where students from two or more professions learn with, from, and about each other to improve collaboration and quality of care (World Health Organization [WHO], 2010), is no longer the optimized educational trend that it was in the early to mid-2000s, but rather a mandate of many accrediting organizations for nursing and medicine. The American Association of Colleges of Nursing and the Association of American Medical Colleges along with a total of 6 health care professional organizations developed core competencies for interprofessional collaborative practice (Interprofessional Education Collaborative Expert Panel, 2011). The IPEC competencies were developed in part to guide efforts in developing curriculum, learning and assessment strategies aimed at incorporating the interprofessional core competencies in healthcare education to improve teamwork and collaboration. It is essential that nurse educators evaluate current teaching strategies related to interprofessional education to promote meaningful curriculum...
development and to advance educational pedagogy.

2. Background

With the expansion of IPE, it’s important to seek an understanding of what students learn from these types of educational interventions. IPE studies have primarily focused on exploring the impacts of an IPE activity or course on knowledge gained (Evans et al., 2012; Hunter et al., 2015), faculty attitudinal shifts about interprofessional education (Beck Dallaghan et al., 2016) and changes in self-reported confidence and competence specific to medical content following an interprofessional learning activity (Herring et al., 2013). Several studies have noted improvements in self-reported student attitudes and readiness to participate in interprofessional learning following an IPE educational activity through the use of the Readiness for Interprofessional Learning Scale (RIPLS) (Posey et al., 2018; Rossler and Kimble, 2016).

Despite these findings, current research has failed to develop a complete picture of the learning that occurs during the IPE process. Nurse educators are called to evaluate the effectiveness of teaching methods to ascertain changes in student’s knowledge, skills and attitudes toward inter-professional practice. The researchers seek to assess the effects of a week-long interprofessional education activity on the participant’s knowledge acquisition regarding professional roles and contributions to health care and thus contribute to the current body of knowledge. Therefore, the specific aims of this study were to:

1. Assess what students (nursing and medical) learned with each other following a week long IPE course through qualitative methods.
2. Assess what students (nursing and medical) learned from each other following a week long IPE course through qualitative methods.
3. Assess what students (nursing and medical) learned about each other following a week long IPE course through qualitative methods.

3. Methods

3.1. Methodology/research design

Following university level institutional review board approval (IRB #MOD00031216), a convenience sample of post-course survey responses from students participating in a week-long, inter-professional, simulation-based patient safety course (Sanko et al., 2015) was used to longitudinally explore what participants learn with, from, and about each other. The five day course (intervention) took place in the setting of a private research university in the southeast part of the U.S. and consists of a variety of team based educational activities including simulation scenarios, didactic, student presentations, game-based activities, and an art based visual thinking exercise with the goal of exploring topics related to inter-professional teams, patient safety concepts and communication. Students participating in the course are nursing students enrolled in the accelerated option Bachelor of Nursing program and are in their second semester of three. The medical students enrolled in the course are entering their 3rd year of a 4 year curriculum. Learning outcomes for the program include: 1) Students will utilize effective communication and leadership skills while working in interprofessional teams to provide safe patient care.

2) Students will describe the roles of various of healthcare providers and their respective contributions to patient care.

3.) Students will demonstrate strategies to mitigate healthcare associated errors while working in interprofessional teams.

Across the four years of analysis a total of 272 second semester accelerated option Bachelor of Nursing students (avg per year = 68) and 599 (avg per year = 150) medical students entering 3rd year of the program took part in the annual patient safety course (Table 1) (Fig. 1).

3.2. Data collection

Data from post-course evaluations were used for this investigation. A total of four years of evaluations were analyzed (2013–2016) for this longitudinal study exploring what students participating in an IPE course report learning about interprofessional teams. Qualitative data from three open-ended questions included in the post-course evaluation was used for this study. The evaluations consisted of three open-ended questions asking participants about what they learned, from, with, and about participants from the other/different discipline, as well Likert scale questions assessing participants’ opinion of various aspects of the course.

Three questions were worded specifically for students from each student discipline (medicine or nursing) that participated in the courses. Medical students were asked: (1) What were the lessons you learned from the nursing students? (2) What were the lessons you learned about the nursing students? (3) What were the lessons you learned together with the other profession that you will remember?

Similarly, the nursing students received the following questions: (1) What were the lessons you learned from the medical students? (2) What were the lessons you learned about the medical students? (3) What were the lessons you learned together with the other profession that you will remember?

3.3. Data analysis

Thematic analysis was used to evaluate and summarize the themes. This is a qualitative research method for analyzing text data (Cavanagh, 1997) that describes a family of analytic approaches rather than a single approach (Rosengren, 1981). Broadly, it can be described as a research method used to analyze the content of text in order to draw inferences and conclusions - (Nachmias and Frankfort-Nachmias, 1976). The specific type of thematic analysis selected for a study is driven by theoretical frameworks and the specific questions sought to be answered (Weber, 1990). For this study, the question being explored was: what is it that students participating in IPE learn from, with, and about each other during IPE encounters. Since little is known a priori about what participants learn during IPE encounters, a conventional content analysis approach was used, thus permitting an initial exploration of participants’ learning.

Data was exported from the survey system data base into a text file. The data was analyzed by a researcher experienced in qualitative research using a thematic analysis approach. Thematic analysis included an initial read through was made of the data for the purposes of becoming familiar with the data. Next, a process of coding each response was made to assist with sorting and developing an understanding of the data. A simple paper and colored pen approach was utilized for this step. Next, a secondary immersion with the coded data was made to help further understand and pull out the themes of each question from the perspective of the student type(s) and given the context of the course. Finally, a second researcher familiar with the approach looked over the data and coding structure to insure consistent interpretation of the analysis. Following completion of the thematic analysis for each year of the course, the identified themes were then reviewed both within each year as well as across the four years included in the study. This additional step allowed the researchers to examine thematic differences, develop hypotheses, and draw conclusions.

### Table 1

<table>
<thead>
<tr>
<th>Year</th>
<th>Nursing students</th>
<th>Medical students</th>
<th>Total students</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>70</td>
<td>150</td>
<td>220</td>
</tr>
<tr>
<td>2014</td>
<td>60</td>
<td>141</td>
<td>201</td>
</tr>
<tr>
<td>2015</td>
<td>74</td>
<td>154</td>
<td>228</td>
</tr>
<tr>
<td>2016</td>
<td>68</td>
<td>154</td>
<td>222</td>
</tr>
<tr>
<td>Total</td>
<td>272</td>
<td>599</td>
<td>871</td>
</tr>
</tbody>
</table>
variability in learning from year to year as well as to identify trends within each given year. This approach also provided insight into how changes in the content of the course may have impacted learning. Of note, the bulk of the content of the course remained consistent from year to year, however, there were modifications made to the curriculum made based on the previous year’s students’ evaluations and feedback from faculty and course directors. An example of a curricular change was that of revising the simulation scenarios to ensure that the students were exposed to more clinical variation across scenarios. Due to some diagnostic similarities among the simulated patients presented during the simulation encounters embedded in the course, scenarios were updated to make diagnoses more distinct. These changes, however, did not impact the objectives of the simulation scenarios themselves, nor the overall objectives of the course. All data were collected in an anonymous fashion and were, therefore de-identified.

4. Results

A total of 871 students participated in the week-long patient safety course over a four-year period (Table 1). Opinions of the course were very positive, with more than 80% of participants strongly agreeing or agreeing that the course provided ample opportunities to gain knowledge, that the course activities were valuable for professional growth, and that beyond this week, they would like more IPE opportunities (Table 2).

Overall, the themes that emerged from the open-ended prompting questions revealed the students’ realizations that both nurses and physicians play important roles in healthcare teams; “as always, two heads are better than one. So working with one another as a team, and not just individuals is crucial to adequate patient care.” Participants also noted differences in curricula that the students covered prior to the IPE course; “I learned that their (nursing) curriculum is fast-paced and clinical-based [sic], and as a result, they have much more practical and hands-on learning than the medical students.” Another student noted, “I learned almost immediately how differently we are trained. And I think that is great. If we are supposed to work together and help one another one day we should better understand each other's schooling, how and what we are taught.”

The importance of communication and collaboration also arose as a major theme; “Communication is very important in our career.,” “I learned the importance of clear, concise communication in the healthcare field”, “how critical it is to work together and have open communication between doctors and nurses[sic]”.

The analysis also sought to identify patterns or themes by course year; no significant patterns based on year of participation were found, suggesting consistency in what is learned by the students from year to year. However, themes identified based on each specific prompting question did demonstrate interesting findings as described below.

<table>
<thead>
<tr>
<th>Year</th>
<th>The course provided ample opportunities to gain knowledge</th>
<th>Overall, the activities during the course were valuable for professional growth</th>
<th>Beyond this week, I would like the opportunity to participate in more IPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>Strongly agreed/agreed (96%)</td>
<td>Strongly agreed/agreed (88%)</td>
<td>N/A*</td>
</tr>
<tr>
<td>2014</td>
<td>Strongly agreed/agreed (85%)</td>
<td>Strongly agreed/agreed (91%)</td>
<td>Strongly agreed/agreed (90%)</td>
</tr>
<tr>
<td>2015</td>
<td>Strongly agreed/agreed (88%)</td>
<td>Strongly agreed/agreed (91%)</td>
<td>Strongly agreed/agreed (84%)</td>
</tr>
<tr>
<td>2016</td>
<td>Strongly agreed/agreed (88%)</td>
<td>Strongly agreed/agreed (87%)</td>
<td>Strongly agreed/agreed (89%)</td>
</tr>
</tbody>
</table>

* Not asked in 2013.
4.1. What students learned together with one another

Themes for the question related to what students learned together included: the importance of collaboration and teamwork, application of book knowledge to clinical settings, the need for effective communication, the need for team leadership and designated roles, and the value of varied perspectives within a team.

“Together, we learned that working together across disciplines is not only enjoyable, but it can result in a higher chance of successful patient care. We learned that even though we have different titles and different training, we are all very important parts of providing care”.

4.2. What nursing students learned from medical students

Themes from the question addressing what nursing students learned from the medical students included: the importance of teamwork, the need for effective communication, and the importance of roles. Exemplar comments included:

“I learned that it is incredibly important to get a different perspective in all situations. I also learned that teamwork is incredibly important and that there are times to talk and times to listen”, “Everyone has the same goal but different perspectives in a clinical case. If we embrace our differences, each person can make a valuable contribution and work together as a team”, “Communication and respect between each other will facilitate the best and safest patient centered care possible. We have also learned how important it is to have a leader in a situation with assigned roles and tasks to be done”.

Working with the medical students made some nursing students aware of perceived gaps in knowledge especially in the areas of pharmacology and making diagnoses;

“Medical students have a better understanding of pathophysiology to make a diagnosis ”, “It is important to know the drugs and to have the vocabulary and knowledge to understand how the patient will be treated and what diagnosis to expect”, “During patient treatment it is important to keep in mind possible drug interactions and to start with a broad variety of differential diagnoses”, “I need to be more aware of the pharmacology”, “I need to hone up on my science. Also, I learned what a differential diagnosis was and how they [the medical students] arrive at it”.

4.3. What medical students learned from nursing students

Responses to the question; ‘If you are a medical student what did you learn from the nursing students’ included themes having to do with skills, paying attention to details, nurses’ roles in healthcare, quality of communication, and the knowledge base of nursing students.

Quotes exemplifying the themes demonstrate the practical lessons the medical students gained from their interactions with the nursing students.

“I learned how to put on an oxygen mask and change the oxygen going to the patient.”, “Obvious details are important – what does the patient’s bracelet say? Is their medication connected to anything?”, “One lesson I learned from the nursing students is to never forget to check on the respiratory rate.”

While much of what the medical students reported that they learned from the nursing students was found to be technical in nature, they also stated that they learned about the nursing students’ contributions to the team;

“We are all part of a team, everyone has an important role and everyone contributes according to their roles”, “I am humbled by their knowledge and have the utmost respect for their abilities”, “They are just as enthusiastic and knowledgeable as we are and should be considered team members and our partners rather than separate healthcare providers”.

Some reflections by the medical students were reflective of the perceived differences in the emphasis of their respective curricula.

“I learned from the nursing students more how the nurses view the role of the physician vs the role of the nurse [sic]. It seems their curriculum focuses more on the nurse-doctor relationship and appropriate interactions, whereas we have very little mention of nurses at all in our curriculum (beyond this week)”. “I learned that their curriculum is fast-paced and clinical-based [sic], and as a result, they have much more practical and hands-on knowledge than the medical students”, “They were more familiar with the equipment and protocols compared to the medical students. As medical students we had little to no knowledge about the clinical setting.”, “I learned much more about how to talk to patients about their social histories (i.e. how to ask about domestic violence, abuse, etc.). In medical school, we are not really given opportunities to talk to patients who are victims of abuse in our first two years. Nursing students helped us feel more comfortable interviewing a patient about their social histories.”

4.4. What nursing students learned about medical students

The prompt question asking the nursing students what they learned about the medical students elicited themes around communication, collaboration, and differences in training, education and knowledge.

“I learned that at the end of the day, we all have the same goal but our approaches may be different. Our different curriculums [sic] are actually an asset because together we can see the whole picture. While they view the patient and their illness more technically, I am looking at the patient on a more psychosocial level and I realized this early on with the first simulation. The medical student asked about her symptoms immediately while I addressed her need for the sunglasses inside. Both are equally valid approaches so we need to work together and join our different ways of seeing things.”

The nursing students also commented on how the IPE course changed their outlook on their future work on healthcare teams, are great people. It totally changed my outlook on the newer generation of future doctors. They are humble, great communicators and great listeners”. “The medical students are very willing to accept nurses with open arms. They see us as a valuable team member. This made me realize that we can have a very effective team without a power gradient.”

4.5. What medical students learned about nursing students

The medical students’ reflections on the question about what they learned about nursing mirrored many of the themes found in the prompt about what they learned from the nursing students, including the practical knowledge the nurses had compared to their book/theoretical knowledge;

“I never realized how much more they know about the practical application of the things we learn in class, and the actual skills needed to work equipment and administer meds [sic].” The medical students also commented on how their expectations of nursing were changed by the course experience “I expected them to be more acquainted with the medical equipment and devices than the medical students. What I did not anticipate was their proficiency in taking the history and physical as well as their ability to make “nursing diagnoses.” “Wow – so this was the best part! I realized that I basically know nothing about lines, catheters, etc.”
The nursing students were amazing and it was so good to get this exposure before I get into the hospital and inherit my intern or resident's opinion about nurses (especially if it's a negative opinion).", "I was surprised with how knowledgeable they were after only one year of coursework.", "I learned that nursing students learn different information than medical students, rather than just less information as I assumed in the past".

A related theme emphasized the unique value nurses bring to a team,

"I learned that they possess different knowledge which complements the doctor's", "The nursing students have a specific expertise that we do not have at all and will probably never have. They are the first and last people to be in contact with the patient and hold a valuable role in preventing errors made by physicians and other medical professionals."

Differences in the curricula were highlighted, "They know more than us regarding most aspects of clinical medicine. Our curriculum could be stronger in that area during the first two years." Finally, differences in respective outlooks emerged as a theme, "The nursing students bring a whole different perspective on things.", "I learned the unique and valuable perspective that nurses can bring to a team, and how to utilize our different perspectives.", "The nursing students provide a unique perspective to the care team and can be utilized in really effective ways to provide prompt and adequate care.", "It was good to see the perspective they bring to patient care."

5. Discussion

Most IPE courses have the goal of learners gaining knowledge from, with, and about each participating health care providers respective discipline; however, it is often not clear if this goal is being reached, or what is the exact nature of the knowledge gained from participation in such courses. While our program also seeks this goal, an additional goal is to have an overall impact on patient care as these students leave the course and continue on their educational pathway toward professional independence. The course evaluates students' learning outcomes on several levels that align with Kirkpatrick's frame work (Kirkpatrick, 1994, 1996). Students' reactions (level 1) are found following each of the course's simulation encounters during the debriefing phase of these learning opportunities. Learning (level 2) is assessed mid-week and during the final day of the course where the students are evaluated on their teamwork. A mid-week teamwork evaluation takes place as a part of the usual course using trained raters who score each team during a simulated multi-patient simulation encounter using the UM-CRM tool. Based on the scores from this mid-week team level evaluation two teams are selected to compete in the end of course Simulation Olympics where they are evaluated again using the same tool by their peers. Further details on the educational rational of this learning approach are provided as part of a prior study completed by our team (Sanko et al., 2015). Additionally, learning is assessed through the final course evaluation, and assignments that are embedded in the course.

Organizational performance (level 4) is also evaluated during the mid-week and Simulation Olympics activities that occur. Finally, since the course simulation activities become progressively more challenging and build in the prior days' lessons they provide a forum to see behavioral change (level 3). Examples of behavior change that have been noted from simulation encounter to simulation encounter are the improvements in hand washing, calling for help, forming a team replete with a team leader, task delegation, and communication.

The findings of this study have helped to clarify what participants taking part in an IPE course are “taking away” from IPE experiences, how such courses are changing the views of the various disciplines among participants, and how they learn to value, trust, and support one another within a team. Interestingly, the general themes identified from the analysis of the open-ended responses were found to generally align with the Interprofessional Education Collaborative (IPEC) competency domains of roles/responsibilities, interprofessional communication, teams/teamwork and values for interprofessional practice (Interprofessional Education Collaborative Expert Panel, 2011). The IPEC competencies were developed in part to guide health care educator's efforts in developing curriculum, learning and assessment strategies aimed at incorporating core competencies identified as essential to working in teams.

From the narrow perspective of educational impact and value, it is important to capture what lessons and insights learners obtain following participation in an IPE course. However, from a broader perspective, it is perhaps of greater value to know the ways that various professions view other professions (Gillette et al., 2019), how individuals develop trust and respect within and among various disciplines (Oxelmark et al., 2017) as well how insights into how all members of a healthcare team work toward mutual goals are gained. It was not entirely surprising to discover from this study that there were stereotypical views, biases, and misunderstandings about both nursing and medicine as this has been noted among various pre-licensure healthcare students in other studies as well (Oxelmark et al., 2017; Thurston et al., 2017; Gillette et al., 2019). Furthermore, it was interesting to gain insights into how pre-licensure students viewed their futures in terms of membership in an inter-disciplinary team. Finally, it was thought-provoking be able to see how little each nursing student and medical student knew about how the ‘other’ is trained, or what their knowledge bases and skill sets are. This newfound perspective sheds light on why nursing and medicine may have unique challenges in working on teams together. In the absence of knowing what the other health care provider knows or does, it is hard to navigate where one belongs and how one contributes to team goals. As educators, we need to do more to expose learners to the unique knowledge and skills of other disciplines so they gain a more solid understanding of team roles (Gillette et al., 2019; Oxelmark et al., 2017).

This rare view into the perspectives and views of healthcare disciplines that has been captured should be broadly interesting to educators involved in IPE. The findings of this study adds to what is known about the impacts of IPE and further provides a basis for the development of more specific curricular content as part of IPE endeavors to further strengthen positive views of healthcare professions, to foster a more collaborative mindset, and to correct misconceptions or discipline-specific falsehoods (Oxelmark et al., 2017). Future work in this area might include further exploration into where these ideas, perspectives and views stem from, so that interventions to correct misconceptions or codify positive behaviors can be appropriately placed in educational programming.

Strengths of this study include the longitudinal view, and the evaluation of learning within the context of a stable long-standing course taught by an interdisciplinary team of experts in patient safety, simulation-based education and IPE. Limitations of this student include the single educational setting in the context of a single IPE patient safety course. It is possible that the findings were a reflection of a narrow view created by the educational environment as opposed to themes that might be found more broadly. The use of a multi-year analysis helps to mitigate this risk, but further research utilizing a multi-site/course approach would help to answer this question.

6. Conclusion

Inter-professional education provides a unique platform from which students can learn not only from, but also with, and about those professionals with whom they will eventually work on teams. IPE can help to build a foundation of understanding about working with other professionals that may be important to future successes when working as part of a team. IPE also provides an opportunity for students to gain knowledge that may not be included in their own curricula, to establish trust of the other profession early on and throughout their pre-
professional education, and learn how each profession contributes to the goals of the work of caring for patients.

Author statement

All authors (Jill Sanko, Mary Mckay, Ilya Shekhter, Ivette Motola, David Birnbach) contributed to the conceptualization, methodology, research process and manuscript preparation.

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Ethical approval

IRB approval was granted for this research study.

Declaration of competing interest

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

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