

A Mixed Methods Analysis of Student Attitudes in a Graduate Interprofessional Education Population Health Course

Jennifer Taylor Alderman PhD, RNC-OB, CNL, CNE, CHSE *Assistant Professor, University of North Carolina at Chapel Hill School of Nursing*

Lisa De Saxe Zerden PhD, MSW *Associate Professor, Senior Associate Dean for MSW Education, Social Work Director for Interprofessional Education and Practice, University of North Carolina at Chapel Hill School of Social Work*

Meg Zomorodi PhD, RN, CNL, FAAN, ANEF *Professor, Assistant Provost and Director of the Office of Interprofessional Education and Practice, University of North Carolina at Chapel Hill*

Abstract

BACKGROUND The imperative to increase interprofessional education (IPE) in health professions' schools has been well-established. While most IPE research has explored the impact of IPE on understanding the perspectives of other professions, this paper contributes to the examination and impact of IPE on one's own profession.

PURPOSE The purpose of this study was to determine graduate students' attitudes and perceptions of IPE and team collaboration following completion of an interprofessional population health course.

METHOD The IPE intervention was a semester-long population health management course wherein students from multiple health professions schools engaged in innovative team collaborations. Embedded measures and course evaluations provided data points for analysis.

DISCUSSION The AITCS instrument showed statistically significant improvement overall on most subscales. Qualitative analysis revealed five themes, including recognition of unique perspectives and increased clarity of roles.

CONCLUSION Findings support the importance of IPE in improving partnership, cooperation, and coordination among health professionals. Students' reflections validated quantitative findings and offered optimism about their working relationships with other healthcare professionals.

Received: 06/01/2020 Accepted: 09/11/2020

© 2021 Alderman, et al. This open access article is distributed under a Creative Commons Attribution License, which allows unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Implications for Interprofessional Practice

- Findings support the importance of IPE to improve partnership, cooperation, and coordination among health professional students which can positively impact working relationships post-graduation, when in practice.
- Awareness of students' pre-existing biases towards other professions can help clarify role ambiguity. This is important to help crystalize one's own professional scope of practice.
- Students repeatedly noted the importance of interprofessional communication and its relationship to quality and safe care. Given ineffective communication in health care is the largest contributor to health care errors (The Joint Commission, 2015), recognizing this as a vital component of team-based care will help prepare students for future practice and communication expectations.

Introduction

The imperative to increase interprofessional education (IPE) in health professions schools is well-established (Foronda, MacWilliams, & McArthur, 2016). IPE has been shown to impact the knowledge, skills, and attitudes of students in health professions schools (Lutfiyya, Brandt, Delaney, Pechacek, & Cerra, 2015) as well as impact quality and safety (Reeves, Boet, Zierler, & Kitto, 2015). Literature from the past decade has shared ways to implement IPE learning activities across academic settings (Djukic, Fulmer, Adams, Lee, & Triola, 2012; MacDonnell, Rege, Misto, Dollase, & George, 2012; Zomorodi et al., 2018), didactically in course work (Zomorodi et al., 2017), in clinical environments (Laksov, Boman, Liljedahl, & Björck, 2015), or in both traditional classroom and clinical practice settings (Lutfiyya, Brandt, & Cerra, 2016). In all instances, faculty must carefully consider the planning, implementation and outcome of these IPE experiences (Sunguya, Hinthong, Jimba, & Yasuoka, 2014). The National Center for Interprofessional Practice and Education (NCIPE)/Health Professions Advisory Committee (HPAC) (2019) document calls for more quality interprofessional education initiatives to be deliberately designed with clear evaluation metrics identified. The Interprofessional Education Collaborative (IPEC) has designed a group of four competencies for IPE. Using these competencies as a framework for IPE course development further validates the competencies, as well as adds to the IPE research base. These four competencies are roles and responsibilities, values and ethics, interprofessional communication, and teams and teamwork

(IPEC, 2016). While most IPE research has explored the impact of IPE on understanding the perspectives of other professions, this paper contributes to the examination and impact of IPE on one's own profession. The NCIPE/HPAC 2019 document supports the need for more research in this area, and recognizes that students' professional identities are shaped through experiences that allow for both uniprofessional and interprofessional identity formation. Activities that are designed to build student's identities both as a member of a distinct profession and as a member of an interprofessional team, can ultimately allow graduates to contribute their unique professional expertise to team-based care (Khalili, Orchard, Laschinger, Farah, 2013). Therefore the purpose of this study was to determine graduate students' attitudes and perceptions of IPE and team collaboration following completion of a semester-long interprofessional population health course.

Literature Review

Interprofessional education (IPE) occurs when health care professionals learn from, with, and about each other (World Health Organization, 2010). Nursing, medicine, pharmacy, social work, public health, dentistry, occupational therapy, and others are examples of health care professions. Interprofessional education has been recognized as an innovative method to educate health care professionals at both the student level and after the students are practicing in their respective fields (Reeves, Fletcher, Barr, Birch, Boet, Davies, McFayden, Rivera, and Kitto, 2016). The intent of IPE at the student level is to produce health care

professionals who are ready to effectively communicate in patient care settings once they are in the health care workforce (Gilligan, Outram, and Levett-Jones, 2014). The intent of IPE at post-education level is to improve the communication skills of practicing health care professionals (Reeves et al., 2016). Communication skills have been shown to improve for students who have engaged in IPE, thus leading to effective collaboration (Gilligan, Outram, and Levett-Jones, 2014). Extrapolating this information to health care errors, it makes sense that, if ineffective communication is the number one cause of errors, then improving communication and collaboration through IPE would likely lead to decreased errors and, in turn, improved patient safety (Reeves et al., 2016).

Much research has been conducted about IPE, particularly regarding the impact of IPE on the knowledge, skills, and attitudes of students (Reeves, et al., 2016). Additionally, while the majority of literature on IPE has focused on changes in learners' attitudes, knowledge, and skills following IPE educational activities, there is a need to understand the impact of IPE on individual role development and socialization (Khalili, Orchard, Laschinger, Farah, 2013). Research suggests that when students are not given the opportunity to discuss the unique contributions that their roles can offer in healthcare, that this can be seen as a threat to their own professional identity and therefore can become resistant to collaboration (Wakefield, Boggis, & Holland, 2006). Although the literature supports the need to develop individual identities and roles, there is a lack of research exploring the impact of interprofessional education on the development of individual and team roles (Khalili, Orchard, Laschinger, Farah, 2013).

Another gap in the research currently exists related to examining the effect of IPE on patient outcomes (Brandt, Lutfiyya, King, and Chioreso, 2014). It is difficult to evaluate the effects of IPE on patient outcomes in a rigorous manner due to numerous contextual factors (Zwarenstein and Reeves, 2006). Contextual factors that affect the quality of IPE and its impact on student and patient outcomes include schedule conflicts among health professional schools, lack of faculty trained in IPE, pre-existing student attitudes about IPE, and the existence of professional stereotypes and hierarchies (Reeves et al., 2016).

Need for Qualitative Research Component in Interprofessional Education

Qualitative research can be used to investigate contextual factors to better evaluate the effectiveness and impact of IPE (Reeves, Zwarenstein, Goldman, Barr, Freeth, Koppel, and Hammick, 2010; Reeves, Palaganas, and Zierler, 2017). Qualitative data has the potential to offer enhanced understanding into the experience of students participating in IPE by providing a means through which students can describe their individual experience with IPE in rich detail (Reeves et al., 2010). Ideally, this would aid in increasing understanding of how IPE influences the attitudes and behavior of the participants and can thus be replicated in additional studies, impacting more students by enabling them to understand each other's roles on health care teams, ultimately improving communication, collaboration, and patient safety (Reeves et al., 2010).

Study Aims

This study was guided by two primary aims using a mixed methods approach. Using an established instrument, we: (1) examined how students from multiple health professions improve team collaboration over the course of a semester and (2) to qualitatively describe the lived experience of the students taking course.

Methods

This study took place at a public university in the Southeastern United States that comprised graduate programs in nursing, medicine, pharmacy, social work, and public health. Twenty-five students from these schools enrolled in an elective population health management course in the fall semester of 2016. Students were assessed at the beginning and end of their semester using the Assessment of Interprofessional Team Collaboration Scale (AITCS) and were also assigned a reflective paper to capture qualitative data to complement quantitative data. The interprofessional population health management course was designed as a hybrid course that included on-line modules each week and face-to-face meetings about once a month (Zomorodi et al., 2017). Enrolled students completed in-class and online work in interprofessional teams, as

assigned by the course instructors to ensure interprofessional cross-pollination by profession. Institutional Review Board (IRB) approval was obtained.

Study Sample

The sample was comprised of 25 graduate students representing medicine, nursing, pharmacy, social work, public health, and health care administration professions. There were 8 medical students obtaining a dual degree in public health (MPH), 5 social work students, 4 nursing students, 4 pharmacy students, 1 public health student, 1 medical student, 1 practicing physician obtaining a Master's degree in public health (MPH), and 1 health care administration student. Years of experience in health care ranged from 0 years to 21 years. There were 14 female students and 11 male students.

Study Instrument

The Assessment of Interprofessional Team Collaboration Scale (AITCS) measures attitudes and perceptions of participants about team collaboration (Orchard, King, Khalili, & Bezzina, 2012). The tool is composed of three subscales—partnerships, cooperation, and coordination. There are 37 items in the instrument. Each item is assessed using a 5-point Likert scale: 5 = always, 4 = most of the time, 3 = occasionally, 2 = rarely, and 1 = never (Orchard et al., 2012). Reliability and validity of the AITCS was established in initial testing of the instrument. Internal consistency was 0.98, using Cronbach's coefficient alpha. Cronbach's alpha results for the three subscales—partnerships, cooperation, coordination—were 0.97, 0.94, and 0.80, respectively. Face, content, and construct validity were also evaluated. The instrument was shown to measure what it was designed to measure; a group of content experts reviewed each scale item; and, statistical testing, including factor analysis, was performed to determine construct validity (Orchard et al., 2012). While there are other IPE instruments that could have been selected, the AITCS was chosen because of its rigorous development, having gone through domain identification and generation, content validity testing and a factor analysis. The AITCS has strong psychometric properties and is recognized as a reliable and valid tool.

Prior to beginning the modules, the students complet-

ed the AITCS on their learning management system (LMS). Students then completed the AITCS following completion of the interprofessional population health course and the survey data was exported, de-identified, and cleaned. All data were uploaded into SPSS version 24 (IBM, 2015) for analysis.

Analysis of Activity

Quantitative Data Collection and Analysis

Analysis. Descriptive statistics were obtained, including mean and standard deviation. Paired-sample t-tests were used to compare item means at the beginning of the course (pre) and at the end of the course (post). Total item means were compared, as well as subscale item means. Due to the small sample size, it was not prudent to compare mean differences of specific professions. For example, there was only one health care administration student.

Qualitative Data Collection and Analysis

Collection. Twenty-five reflective papers were available for thematic analysis. Thematic analysis is a foundational method for qualitative analysis that has been used to identify, analyze, organize and describe themes (Braun & Clarke, 2006; Nowell, Norris, White, & Moules, 2017). The papers averaged between 3-5 pages in length. The qualitative paper was part of a final course reflection read by one of the course coordinators as part of a course grade. Members of the research team analyzed this content to identify themes.

Analysis. Thematic analysis of the papers occurred by the lead author, with clarification and discussion occurring by the author team. Thematic analysis occurred through multiple readings, identifying codes and then themes, ultimately reducing the data to five themes. Prolonged engagement with the data, as well as the use of field notes to document an audit trail contributed to rigor and trustworthiness of the data analysis (Nowell, Norris, White, & Moules, 2017). Particularly illustrative student quotes were identified through repeated readings of the papers. Throughout this process, the perceived impact of IPE to the students' current and future practice was examined.

Results

Quantitative Results

The quantitative data revealed statistically significant differences for total item mean scores ($p=0.009$) on

pre-and-post AITCS measures. Statistically significant differences were also found on the AITCS partnership subscale ($p=0.016$) and coordination subscale ($p=0.030$) (See Table 1). The cooperation subscale score increased but was not significant ($p=0.108$).

Means and standard deviations are depicted in Table 1.

AITCS	Pre-Pop Health	Post-Pop Health	<i>p-Values*</i>
	Course (Mean, SD)	Course (Mean, SD)	
Total score	4.12, 0.50	4.31, 0.39	0.009
Partnership	4.08, 0.48	4.27, 0.45	0.016
Cooperation	4.31, 0.51	4.43, 0.36	0.108
Coordination	4.02, 0.65	4.28, 0.46	0.030

Table 1. *AITCS Results* *Level of significance set at $p<0.05$

Qualitative Results

The data revealed that each of the 25 students completed the course having learned much about others' professions, as well as their own. Students also reflected upon learning about population health and how social determinants impact the health of groups. They learned practical skills about conducting quality improvement projects, performing needs assessments, and the current state of health care from a financial perspective. Five themes related to the IPEC competencies were identified from the qualitative analysis: recognition of unique skill sets, perspectives, and knowledge base; patient-centered care is the common goal of all health professions; transition from role ambiguity to role clarity; identifying the existence of biases and barriers in the health care system; optimism about the future, including recognition of the importance of each profession being able to practice at the "top" of their respective licensure.

Illustrative quotes embodying each theme are demonstrated below.

Unique Skill Sets, Perspectives, and Knowledge Base. Noting the uniqueness of each profession, one medical student wrote "*it was always a joy to hear the unique insights that each member of the team brought to the table.*" Another medical/public health student noted that "*I never fully appreciated the perspective and insight that could be gained from a multitude of*

health care providers." A social work student commented "*...I am appreciative of this course for allowing me to see that everyone has different beliefs and backgrounds and approach health care and health care advice differently.*" A nursing student noted that "*...we agreed that each profession possesses a unique body of knowledge that is critical to providing optimal care for our patients.*" A pharmacy student learned how professions "*uniquely contribute to patient care in a way only they can. The pharmacist cannot do the social worker's job and the medical doctor cannot do the nurse's job, without neglecting their own...we have to ...allow each member of the team to influence patient care with their unique expertise.*"

Shared Goal of Patient Centered Care. Remark- ing on patient-centered care being the common goal, a medical student noted that "*shared interprofessional education highlights common goals between profes- sionals for their patients, which is better for patient- centered outcomes.*" A medical/public health student stated:

At the end of the day, we are all here to achieve the same goal: to provide comprehensive...care to our patients. Our patients are priority number one and should always be treated as such. Having the luxury of working with so many different health care professionals focused on achieving the same overarching goal only enhances the potential for quality care to be provided.

Role Ambiguity to Role Clarity. Describing the transition from role ambiguity to role clarification and the presence of pre-existing biases, one social work student wrote:

This class has shifted my opinion of medical providers; I thought maybe they did not care about social work, but I think I have realized that they just are not aware of what we do. This is understandable, and it makes me think about when everyone had to state a common stereotype of their profession in class. That helped me keep an open mind and work to help others understand what my role would be in a health care setting... This course taught me the importance of speaking up and owning what I know...I had to speak up and be confident in my...role...I am now more able to articulate my role as a social worker in the health care system, as a team member, and as a leader.

A nursing student added this statement about roles: *“I am more comfortable asking questions of other professions to get a better idea of job function so that I can better utilize their time. Before this class I would not have asked such questions, but when I did I was pleasantly surprised by the responses.”* Also commenting about the transition from role ambiguity to role clarity, a nursing student noted: *“I did not consider the perspective of the other professions or how it was complementing the nursing focus of the plan of care.”* A pharmacy student remarked about role clarity: *“To my surprise, many of my colleagues were not informed about the extent of training and skills that pharmacists are able to offer...I also learned that in the many areas where my knowledge lacks, there are other students who are the experts.”*

Biases and Barriers in the Health Care System.

Recognition of biases. Noting the existence of biases, a social work student wrote *“I was pleasantly surprised to find that my knowledge was valued as much as anyone else on the health team.”* Also commenting on biases and barriers, a nursing student wrote:

Coming into this class I had these biases against the other professions that I did not realize were acting as a barrier for me to collaborating with them and improving the overall health of my patients. This class helped

me take a step back and put myself in the shoes of other professions so that I can see the patient through their eyes and improve my communication with them... One of the most insightful class activities this semester was the group activity where we expressed a stereotype about our own profession that was not true. The medical students in our group shared that they were not arrogant or careless as some would say about physicians. It was eye opening for me to see that they were aware of these stereotypes and that it was hurtful to them.

Barriers to communication. Illustrative of existing barriers, communication was a common theme that emerged. One medical/public health student wrote *“... most interaction between medical students and other interdisciplinary team members occurs through the electronic health record. This medium is impersonal and has an elevated risk of miscommunication.”* A nursing student wrote about barriers in current system: *“Too often at work we only interact with our own professions, which creates divisions that hinder the care we give to our patients.”*

Optimism for the Future in Health Care. Noting both optimism and the importance of professions operating at their full scopes of practice, a medical/public health student stated *“I plan to surround myself with a team that includes health professionals from several disciplines each working at ‘the top of his or her license’ and that meets routinely to discuss care for individual patients and the clinic population as a whole.”* A social work student wrote about optimism: *“It is my hope that the health care system will eventually shift to a complete interdisciplinary and integrative system that incorporates physical and mental health for every patient it serves.”*

Discussion

This study examined and measured the perception of partnership, cooperation, and coordination among health professional students. Qualitative students' reflections validated the quantitative findings and offered optimism about their working relationships with other healthcare professionals, fulfilling the two study aims. While adding to an increasing body of IPE literature, the findings of this study also reinforced the IPEC competencies.

The two study aims were fulfilled. The first aim was to show that students from multiple health professions improved in team collaboration over the course of a semester. Scores on the AITCS supported this aim. The quantitative analysis and interpretation that highlighted the overall increase in AITCS scores, with overall scale score and two of the subscale score showing statistical significance. The second aim of this study was to examine the lived experience of the students taking course. Qualitative results supported this aim and revealed important findings related to reduced role ambiguity, increased clarity, recognition of biases, and increasing knowledge about population health management and its impact on the larger health care system.

Study findings add to the body of knowledge about how IPE enhances team collaboration and provides valuable personal and professional insights to the students who engage in IPE (Brashers, Erickson, Blackhall, Owen, Thomas, & Conaway, 2016; Chan, Chi, Ching, & Lam, 2010; Cusack & O'Donoghue, 2012; Keller, Eggenberger, Belkowitz, Sarsekeyeva, & Zito, 2013; Meffe, Moravac, & Espin, 2012; Mellor, Cottrell, & Moran, 2013; O'Brien, McCallin, & Bassett, 2013; Paterson, Medves, Dalgarno, O'Riordan, & Grigg, 2013).

The qualitative findings can be linked back to the IPEC competencies. The IPEC competency of roles and responsibilities was addressed by the themes of 'unique skill sets, perspectives, and knowledge base' and 'role ambiguity to role clarification.' Illustrative quotes exemplified how increased understanding of one's own role in addition to understanding the roles of others on the health care team enhance communication, thus optimizing patient outcomes (IPEC, 2016). The IPEC competency 'values and ethics' was reinforced by the themes of 'shared goal of patient-centered care' and 'optimism about the future in health care.' Students appreciated the importance of the interprofessional team in managing patient care. Placing patients at the center of the care provided was valued by the students in this course (IPEC, 2016).

The IPEC competency 'interprofessional communication' was highlighted by the theme of 'biases and barriers in the health care system.' Students repeatedly noted the importance of interprofessional communication and its relationship to quality and safe care. Ineffective communication in health care is the largest contributor to health care errors (The Joint Commis-

sion, 2015). Power dynamics among health care team members, misunderstandings about roles, and lack of effective communication strategies have been identified in the literature as reasons why poor communication leads to health care errors (Foronda, MacWilliams, & McArthur, 2016). A course such as this made strides to alleviate such issues, as shown by the improved collaboration scores and the themes that emerged from the qualitative analysis. Of note, some students did identify power gradients as an existing problem in health care settings; this did not emerge as an overarching theme, but is worth mentioning, as it has been identified as an existing barrier to effective communication in health care settings.

The IPEC competency 'teams and teamwork' was illustrated by the themes 'shared goal of patient-centered care' and 'optimism about the future of health care.' This competency outlines the importance of engaging all members of the health care team in population-focused problem-solving and using process improvement methodologies to increase the effectiveness of policies (IPEC, 2016). The framework of this course centered around population health management in an effort to address an identified gap regarding the impact of IPE. This gap was identified by Brandt, Lutfiyya, King, & Chioreso (2014), who suggested that IPE improving population health has yet to be supported by strong research evidence. The findings of this study at least are moving in this direction, as decreasing health care costs and improving the quality of care are topics covered in this population health management course within the context of working in interprofessional teams.

Implications for Interprofessional Education and Practice

Education. The purpose of this study was to examine how students from multiple health professions can improve team collaboration over the course of a semester-long course. Findings help reinforce how IPE can better align with cultivating IPEC competencies. This study contributes to the IPE education literature by examining the lived experiences of students enrolled in an IPE course as a health professions student. Educators can replicate the premise of this course and utilize the IPEC competencies to develop their own IPE courses to advance collaboration and practice-ready students.

Practice. A core principle of IPE is to educate health professions students so that they will be able to function most effectively in practice settings once they complete their education. Study findings suggest that this population health management course may better prepare health professions students to enter the workforce more knowledgeable about their own roles as well as those of their colleagues. The quantitative findings show that communication and collaboration skills obtained in a course such as this could translate well into professional practice.

Study Limitations

While this sample size yielded some rich qualitative data, it is not possible to draw any generalizable conclusions from the quantitative data of a sample this small. Another limitation regarding sample size was the disproportionate representation from the health professions. Relatedly, while efforts were made to remove names associated with qualitative data, the distribution of students who participated by profession made complete anonymity impossible. Moving forward, as this class will be repeatedly offered, data will be collected over time to increase the sample size and to create a longitudinal study approach. Another limitation of this study was that the course offered was an elective course, meaning the students self-select to take the course, likely indicating an interest in IPE and a desire to improve or learn more about interprofessional collaboration. This could have a potential impact on initial scores, meaning these scores would be higher to begin with, making it more difficult to detect any statistically significant changes. Finally, although reliability and validity of the AITCS have been supported in early testing of the measure, more studies are needed to ensure the utility of this instrument.

Conclusions

Findings from this study offer health professions students perceptions regarding partnership, cooperation, and collaboration. Results add to the literature that shows student gain and professional awareness for those enrolled in health professions' education. The IPEC competencies were upheld through the implementation of this interprofessional population health management course and were reflected back in qualitative themes that emerged. As IPE is a teaching strat-

egy that continues to gain traction, more research is needed to assess how courses such as this one translate to practice change and patient outcomes. This requires longitudinally tracking students while in school, post-graduation, and in their professional roles. As more research is conducted in this area and results show the impact IPE has on patient outcomes, then IPE will be further legitimized (Cox, Cuff, Brandt, Reeves, & Zierler, 2016). With IPE now being a part of health professions' schools' accreditation, it will be required and not optional (Lutfiyya, Brandt, Delaney, Pechacek, & Cerra, 2015). This course is an example of one way to include key IPE competencies in required coursework and how measure students' perceptions about themselves and others can be measured to advance interprofessional collaboration.

References

- Brandt, B., Lutfiyya, M., King, J., Chioreso, C. (2014). A scoping review of interprofessional collaborative practice and education using the lens of the Triple Aim. *Journal of Interprofessional Care*, 28(5), 393-399. <https://doi.org/10.3109/13561820.2014.906391>
- Brashers, V., Erickson, J. M., Blackhall, L., Owen, J. A., Thomas, S. M., & Conaway, M. R. (2016). Measuring the impact of clinically relevant interprofessional education on undergraduate medical and nursing student competencies: A longitudinal mixed methods approach. *Journal of Interprofessional Care*, 30(4), 448-457. <https://doi.org/10.3109/13561820.2016.1162139>
- Braun, V., Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Chan, E. A., Chi, S. P., Ching, S., & Lam, S. (2010). Interprofessional education: The interface of nursing and social work. *Journal of Clinical Nursing*, 19, 168-176. <https://doi.org/10.1111/j.1365-2702.2009.02854.x>
- Cox, M., Cuff, P., Brandt, B., Reeves, S., & Zierler, B. (2016). Measuring the impact of interprofessional education on collaborative practice and patient outcomes. *Journal of Interprofessional Care*, 30(1), 1-3. <https://doi.org/10.3109/13561820.2015.1111052>
- Cusack, T. & O'Donoghue, G. (2012). The introduction of an interprofessional education module: Students' perceptions. *Quality in Primary Care*, 20, 231-238.

- Djukic, M., Fulmer, T., Adams, J. G., Lee, S., & Triola, M. M. (2012). NYU3T: Teaching, technology, teamwork: A model for interprofessional education scalability and sustainability. *Nursing Clinics*, 47(3), 333–346. <https://doi.org/10.1016/j.cnur.2012.05.003>
- Foronda, C., MacWilliams, B., & McArthur, E. (2016). Interprofessional communication in healthcare: An integrative review. *Nurse Education in Practice*, 19, 36-40. <https://doi.org/10.1016/j.nepr.2016.04.005>
- IBM Corporation. (2015). SPSS version 24.0.
- Gilligan, C., Outram, S., & Levett-Jones, T. (2014). Recommendations from recent graduates in medicine, nursing, and pharmacy on improving interprofessional education in university programs: A qualitative study. *Biomedcentral Medical Education*, 14, 1-10 <https://doi.org/10.1186/1472-6920-14-52>
- Interprofessional Education Collaborative (IPEC). (2016). *Core competencies for interprofessional collaborative practice: 2016 update*. Washington, D. C.: Interprofessional Education Collaborative.
- The Joint Commission. (2015). Sentinel event data: Root causes by event type: 2004-3Q2015. Retrieved from http://www.joincommission.org/sentinel_event_statistics/
- Keller, K. B., Eggenberger, T. L., Belkowitz, J., Sarsekeyeva, M., & Zito, A. R. (2013). Implementing successful interprofessional communication opportunities in health care education: A qualitative analysis. *International Journal of Medical Education*, 4, 253- 259. <https://doi.org/10.5116/ijme.5290.bca6>
- Khalili, H., Orchard, C., Laschinger, H.K., Farah, R. (2013). An interprofessional socialization framework for developing an interprofessional identity among health professions students. *Journal of Interprofessional Care*, 27(6), 448-453. <https://doi.org/10.3109/13561820.2013.804042>
- Laksov, K. B., Boman, L. E., Liljedahl, M. & Björck, E. (2015). Identifying keys to success in clinical learning: A study of two interprofessional learning environments. *Journal of Interprofessional Care*, 29(2),156-158. <https://doi.org/10.3109/13561820.2014.942777>
- Lutfiyya, M. N., Brandt, B., Delaney, C., Pechacek, J., & Cerra, F. (2015). Setting a research agenda for interprofessional education and collaborative practice in the context of United States health system reform. *Journal of Interprofessional Care*. <https://doi.org/10.3109/13561820.2015.1040875>
- Lutfiyya, M. N., Brandt, B. F., & Cerra, F. (2016). Reflections from the intersection of health professions education and clinical practice: The state of the science of interprofessional education and collaborative practice. *Academic Medicine*, 91(6), 766–771. <https://doi.org/10.1097/ACM.0000000000001139>
- MacDonnell, C. P., Rege, S. V., Misto, K., Dollase, R., & George, P. (2012). An introductory interprofessional exercise for healthcare students. *American Journal of Pharmaceutical Education*, 76(8), 154–160. <https://doi.org/10.5688/ajpe768154>
- Meffe, F., Moravac, C. C., & Espin, S. (2012). An interprofessional education pilot program in maternity care: Findings from an exploratory case study of undergraduate students. *Journal of Interprofessional Care*, 26, 183-188. <https://doi.org/10.3109/13561820.2011.645089>
- Mellor, R., Cottrell, N., & Moran, M. (2013). “Just working in a team was a great experience...”—Student perspectives on the learning experiences of an interprofessional education program. *Journal of Interprofessional Care*, 27, 292-297. <https://doi.org/10.3109/13561820.2013.769093>
- National Center for Interprofessional Practice and Education/ Health Professions Accreditors Collaborative. (2019). Guidance on developing quality interprofessional education for the health professions. <https://doi.org/10.31496/rpd.v19i40.1288>
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, 16(1), <https://doi.org/10.1177/1609406917733847>
- O’Brien, D., McCallin, A., & Bassett, S. (2013). Student perceptions of an interprofessional clinical experience at a university clinic. *New Zealand Journal of Physiotherapy*, 41(3), 81-87.
- Orchard, C. A., King, G. A., Khalili, H., & Bezzina, M. B. (2012). Assessment of interprofessional team collaboration scale (AITCS): Development and testing of the instrument. *Journal of Continuing Education in the Health Professions*, 32(1), 58-67. <https://doi.org/10.1002/chp.21123>
- Paterson, M., Medves, J., Dalgarno, N., O’Riordan, A., & Grigg, R. (2013). The Timely Open Communication for Patient Safety Project. *Journal of Research in Interprofessional Practice and Education*, 3(1), 22-42.
- Reeves, S., Boet, S., Zierler, B., & Kitto, S. (2015). Interprofessional Education and Practice Guide No. 3: Evaluating interprofessional education. *Journal of Interprofessional Education*, 29(4), 305-312. <https://doi.org/10.3109/13561820.2014.1003637>
- Reeves, S. Zwarenstein, M., Goldman, J., Barr, H., Freeth, D., Koppel, I., & Hammick, M. (2010). The effectiveness of interprofessional education: Key findings from a new systematic review. *Journal of Interprofessional Care*, 24(3), 230-241. <https://doi.org/10.3109/13561820903163405>
- Reeves, S., Fletcher, S., Barr, H., Birch, I., Boet, S., Davies, N., McFayden, A., Rivera, J., & Kitto, S. (2016). A BEME systematic review of the effects of interprofessional education: BEME Guide No. 39. *Medical Teacher*, 38(7), 656-668. <https://doi.org/10.3109/0142159X.2016.1173663>

Reeves, S., Palaganas, J., & Zierler, B. (2017). An updated synthesis of review evidence of interprofessional education. *Journal of Allied Health, 46*(1), 56-61.

Sunguya, B. F., Hinthong, W., Jimba, M., & Yasuoka, J. (2014). Interprofessional education for whom? —Challenges and lessons learned from its implementation in developed countries and their application to developing countries: A systematic review. *PloS One, 9*(5), e96724, 1–17. <https://doi.org/10.1371/journal.pone.0096724>

Wakefield, A., Boggis, C., & Holland, M. (2006). A teaching ward experience: Role blurring is not the answer. *Medical Teacher, 28*(6), 580-581.

World Health Organization. (2010). Framework for action on interprofessional education and collaborative practice. Retrieved from http://www.who.int/hrh/resources/framework_action/en/

Zomorodi, M., Odom, T., Askew, N. C., Leonard, C. R., Sanders, K. A., & Thompson, D. (2018). Hotspotting: Development of an interprofessional education and service learning program for care management in home care patients. *Nurse Educator, 43*(5), 247–250. <https://doi.org/10.1097/NNE.0000000000000523>

Zomorodi, M., Zerden, L. D., Nance-Floyd, B., Alexander, L., Wilfert, R., & Byerley, J. (2017). Impact of an interprofessional population health course and clinical immersion experience: Students and practice outcomes. *Journal of Interprofessional Education & Practice, 9*, 91–94. <https://doi.org/10.1016/j.xjep.2017.08.008>

Zwarenstein, M., & Reeves, S. (2006). Knowledge translation and interprofessional collaboration: Where the rubber of evidence-based care hits the road of teamwork. *The Journal of Continuing Education in the Health Professions, 26*(1), 46-54. <https://doi.org/10.1002/chp.50>

Corresponding Author

Jennifer Taylor Alderman,
PhD, RNC-OB, CNL, CNE, CHSE

The University of North Carolina at Chapel Hill
School of Nursing
Carrington Hall, CB #7460
Chapel Hill, NC 27599-7460

jgtaylor@email.unc.edu