Assessing Interprofessional Education and Collaborative Practice

Among Licensed Healthcare Professionals

by

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To my husband and children, who patiently supported me throughout my journey, and my parents who instilled the value of hard work.

Many of life's failures are people who did not realize how close they were to success when they gave up.

--Thomas Edison

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While my acknowledgements appear on the second page of my dissertation, this was intentionally the last page I completed in my writing sequence. I knew that when I sat down to write this page, it would mean that I had accomplished what I had set out to do. The blank [acknowledgements page] always served as a reminder that I had work ahead of me, and exemplified a goal that I needed to reach. As I type, I watch my words appear on this *previously blank* page, and I realize that I've finally accomplished that goal.

There are a number of individuals who were instrumental in getting me to the finish line, and to whom I owe a debt of gratitude. First and foremost, I'd like to acknowledge my dissertation committee Chair, Dr, Ara Tekian, and committee members Dr. Memoona Hasnain, Dr. Dan Maggin, Dr. Yoon Soo Park, and Dr. Aria Razfar. I cannot thank you enough for your leadership, support, and continuous guidance. I could not have completed this project without your expertise, and endless understanding. I'd also like to acknowledge three people who played a pivotal role in the trajectory of my career. To Dr. Shirley Beaver, who introduced me to the world of academia, Dr. Carla Evans who always advocated for me and served as my greatest role model, and Dr. Ilene Harris who believed in me, and made my dream of earning my PhD a reality. I can say, with full confidence, that I would not be where I am today without their mentorship and support. Finally, I would be remiss if I didn't acknowledge my family and friends who provided unwavering encouragement and compassion when I felt like giving up, and offered sincere understanding when I was unavailable to attend gatherings and events. I can proudly attest that the sacrifice was worth the reward!

While I'm breathing a sigh of relief to have completed the writing process, my final defense still looms ahead. My mind continues to race in preparation, and I often awake at night

ACKNOWLEDGEMENTS (CONTINUED)

and jot down notes and key points for my presentation. Today I experienced something a bit different. While running errands, I randomly noticed a deer outside my car window. Though common in some areas, deer sightings are very rare in and around an urban city like Chicago. When I pulled over to get a closer look, I noticed nine other deer. In a distance, I could see a fawn walking alongside her mother. The deer were frolicking around, burying their noses in the snow, and nipping at the earth below. On occasion, they'd fearlessly look over at me, then continue on with their playful antics. I sat mesmerized, almost paralyzed; with the greatest pause I'd felt in years. I'm unsure how long I sat watching them, but at one point I noticed my mind, which is usually plagued by tasks and agendas, slowed down and was replaced by an unfamiliar calmness.

When I got home, my philosophical side emerged and made me think about the "why". After a lifetime of not seeing deer in the city, what does it mean that I just stumbled across a herd? I began researching the symbolism, and learned that deer represent peace, gentleness, intuition, and devotion. Seeing a deer is thought to be a good omen. It's said that if a deer crosses your path, or makes itself known to you, your spirit guides are watching over you. It's also a reminder to be in the moment, quiet, and thankful.

So, does this mean that the culmination of my PhD work has come down to symbolic insights gained from a deer sighting? Or was this a typical migration of wildlife that I intersected with through happenstance? One can only speculate, but when I look back at the dedication and perseverance that it took to get where I am today, I can relate to the resilience of the deer. When I look ahead, I aspire to become more mindful and present. My journey is now complete, and I'm thankful for everyone who helped me get here; even if one happens to be a deer.

Table of Contents

ACKNOWLEDGEMENTS ..... *ii*

ACKNOWLEDGEMENTS (CONTINUED) ..... *iii*

LIST OF TABLES ..... *viii*

LIST OF FIGURES ..... *ix*

LIST OF ABBREVIATIONS ..... *x*

LIST OF ABBREVIATIONS (CONTINUED) ..... *xi*

SUMMARY ..... *xii*

I. INTRODUCTION *1*

A. Description and Implications **2**

1. Interprofessional Education 2
2. Collaborative Practice 2
3. Context 3

B. Statement of the Problem **5**

C. Purpose of the Study **7**

D. Significance of the Study **8**

CHAPTER II. LITERATURE REVIEW *10*

A. Background **10**

1. Education Context: History of Training Programs for Health Professionals 13
2. Workforce Context: Post-licensure IPE and CP Training 29
3. Summary of Education Context and Workforce Context 35

B. Theoretical Perspective **36**

C. Conceptual Framework 37

1. Experiential Learning Theory 38
2. Adult Learning Theory 41
3. Social Learning Theory 44
4. Contact Theory 45

D. Theoretical/Conceptual Perspective Summary 47

E. Chapter II- Summary 48

Chapter III. METHODOLOGY 49

A. Overview 49

B. Concept Map 50

C. Research Design 51

D. Research Questions 52

E. Research Permission and Ethical Consideration 54

F. Target Population and Sample 54

1. Sample- Survey Participants 54
2. Sample- Focus Group Participants 55

G. Setting 56

H. Procedure, Materials, and Instruments 57

1. Survey Overview 57
2. Survey Instrument 58
3. Validity 59
4. Focus Group Overview 60

I. Data Collection and Analysis 61

1. Quantitative Data 61

2. Qualitative Data 62

Chapter IV. RESULTS 64

A. Quantitative Data 64

1. Subjects Characteristics 66
2. Survey Pilot Test 67
3. Survey Data 67
4. Focus Group Data 74

B. Qualitative Data 75

1. Dental Professionals Focus Group 75
2. Medical Professionals Focus Group 78
3. Nursing Professionals Focus Group 80
4. Pharmacy Professionals Focus Group 82
5. Combined Focus Group Data 83

Chapter V. DISCUSSION AND CONCLUSION 86

A. Discussion 86

1. Quantitative Data Outcomes 86
2. Qualitative Data Outcomes 87

B. Study Strengths 92

C. Study Limitations 92

D. Recommendations for Future Research 93

E. Conclusion 94

REFERENCES 96

APPENDICES 108

Appendix A. Core Competencies for Interprofessional Collaborative Practice 108

Appendix B. Approved IRB 114

Appendix C. Recruitment Flyer.....116

Appendix D. Informed Consent 117

Appendix E. Debrief Form 121

Appendix F. Survey.....123

Appendix G. Answer Key for Survey Section II. 135

Appendix H. Focus Group Workflow and Script.....136

VITA* *141

LIST OF TABLES

TABLE I- PRE-LICENSURE/WORKFORCE IPE & CP LITERATURE……....18

TABLE II- POST-LICENSURE/WORKFORCE IPE & CP LITERATURE……..….32

TABLE III- SURVEY: SAMPLE BY PROFESSION ……...56

TABLE IV- FOCUS GROUP: SAMPLE BY PROFESSION ……...…57

TABLE V- IPE/CP TRAINING DURING PROGRAM……...66

TABLE VI- IPE/CP TRAINING AFTER PROGRAM ……..67

TABLE VII. INDEPENDENT SAMPLES T-TEST-CONFIDENCE ……..69

TABLE VIII. INDEPENDENT SAMPLES T-TEST- KNOWLEDGE……..71

TABLE IX. INDEPENDENT SAMPLES T-TEST- VALUES…….73

TABLE X. DEMOGRAPHICS- FOCUS GROUP SAMPLE ……75

TABLE XI. COMBINED FOCUS GROUP THEMES, SUBTHEMES, & CODES ……...83

LIST OF FIGURES

Figure 1. Experiential Learning Cycle……...39

Figure 2. Kolb's Learning Cycle ……...40

Figure 3. Adult Learning Theory…….....42

Figure 4. Bandura's Social Cognitive Learning……..45

Figure 5. Contact Learning Theory…….47

Figure 6. Concept Map……51

Figure 7. Survey: Sample by Profession…….65

LIST OF ABBREVIATIONS

ACPE	Accreditation Council on Pharmacy Education
ANOVA	Analysis of Variance
CCNE	Commission on Collegiate Nursing Education
CDS	Chicago Dental Society
CHIRP	Collaborative Health Interdisciplinary Relationship Planning Test
CIPE	Continuing Interprofessional Education
CODA	Commission on Dental Accreditation
CP	Collaborative Practice
DME	Department of Medical Education
GSE	Generalized Self-Efficacy Scale
IDFPR	Illinois Department of Federal and Professional Regulation
IFH	Interdisciplinary Family Health
IOM	Institute of Medicine
IPE	Interprofessional Education
IPEC	Interprofessional Collaborative
IPECC-SET	Interprofessional Collaborative Competency Self Efficacy Tool
IPL	Interprofessional Learning
ITC	Information Transfer Communication
JCAHO	Joint Commission on Accreditation of Healthcare Organizations
LCME	Liaison Committee on Medical Education
MHPTS	Mayo High-Performance Teamwork Scale

LIST OF ABBREVIATIONS (CONTINUED)

NEXUS	National Center for Interprofessional Practice and Education
ODP	Operating Department Practice
RFUMS	Rosalind Franklin University of Medicine and Science
RIPLS	Readiness for Interprofessional Practice Learning Scale
SPARX	Student Providers Aspiring to Rural and Underserved Experience
SPE	Standardized Patient Experience
UIC	University of Illinois at Chicago
VAS	Visual Analog Scale
WHO	World Health Organization

SUMMARY

Over the past few decades, research has generated advancements for preventing, diagnosing, managing and treating disease. However, the positive progression has also exposed multifaceted needs, which require a team-based approach to providing health care. Institutions for healthcare have attempted to address this need by redesigning curriculum to include interprofessional education and team-based collaborative practice Still, many practitioners in the workforce fell behind that trend and remain unaware or unclear about concepts for interprofessionalism.

The purpose of this study is to investigate and compare potential differences between licensed healthcare professionals who have received formal training in interprofessional education and collaborative practice to those who have not. The inquiry assessed three factors, interprofessional knowledge, values for interprofessionalism, and confidence in demonstrating interprofessional skills. Study participants were all licensed healthcare professionals representing disciplines in dentistry, medicine, nursing, and pharmacy. The mixed-method study used surveys to gather quantitative data and focus groups to collect qualitative records.

The findings revealed that licensed healthcare professionals who received previous training in interprofessional education and collaborative practice held a more profound knowledge base and stronger values for interprofessionalism and had a greater level of confidence in demonstrating interprofessional and collaborative practice skills when compared to untrained healthcare professionals. These results can help inform the development of coursework/programs focusing on interprofessionalism and collaborative practice for untrained healthcare professionals in the workforce.

I. INTRODUCTION

Through the evolution of healthcare and advancements in medicine, life expectancy has increased drastically over the past few decades. The World Health Organization (WHO) reports that "by 2030, 1 in 6 people in the world will be aged 60 years and over" and "the number of persons aged 80 years or older is expected to triple between 2020 and 2050" (WHO, 2021). While the prospect of living longer is momentous, aging is also associated with a decline in health, a higher risk for disease, and a greater need for complex health care. Multifaceted needs require a sophisticated level of expertise, across all healthcare disciplines, for safe and optimal care delivery. Interprofessional education and collaborative practice are constructs that utilize an educational canvas to illustrate a coordinated and comprehensive approach to patient care. When practitioners from different disciplines are trained to function as a single unit, it bridges the divide between healthcare professionals and provides the fundamental tools required for team-based care.

This chapter will introduce interprofessional education and collaborative practice concepts, offer a brief description of interprofessional and collaborative terms, and define how they intersect in a patient care setting. The premise for the interprofessional healthcare team are described, and roles and responsibilities for members are highlighted. Finally, the problem and overall purpose of the study is shared to offer insight and explanations for the motivation which inspired this PhD study.

A. Description and Implications

1. Interprofessional Education

The Centre for the Advancement of Interprofessional Education (CAIPE) defines interprofessional education (IPE) as "occasions when two or more professions learn with, from and about each other to improve collaboration and the quality of care" (CAIPE, 2002). IPE is an educational concept and pedagogy that supports educating health professionals in a collaborative setting to improve healthcare delivery (Greer et al., 2011). Traditionally, health professions education formats previously utilized uni-professional methods that limited interaction and communication among students from different health professions programs. IPE is now integrated into many health professions curricula to support positive healthcare delivery (Buring et al., 2009). Additionally, IPE has become a standard requirement by accrediting bodies such as the Commission on Dental Accreditation (CODA), the Liaison Committee on Medical Education (LCME), the Commission on Collegiate Nursing Education (CCNE), and the Accreditation Council on Pharmacy Education (ACPE). With an aging population facing complex health care needs, there is a greater demand for healthcare professionals to obtain knowledge, skills, and values associated with coordinated, collaborative care (Lapkin et al., 2013). IPE promotes a team-based approach by outlining the roles and responsibilities of healthcare team members and highlighting how working together can produce more positive patient outcomes. (WHO, 2010, IOM, 2015).)

2. Collaborative Practice

Collaborative practice (CP) expands upon IPE to create clinical practice experiences using simulation and real-world experiences. The Institute of Medicine defines CP as: "an active and ongoing partnership, often involving people from diverse backgrounds who work together to

solve problems, provide services and enhance outcomes" (IOM, 2015). CP transforms healthcare by bringing communication and partnerships to the forefront. Benefits from the open line of communication include shared responsibilities, joint decision-making, and accountability, which can heighten patient safety, shorten hospital stays, and minimize unnecessary costs.

3. Context

As an educator, I have actively taught courses on interprofessional education and collaborative practice. The educational goal is that students will gain an advanced understanding of coordinated patient care, embrace and value the expertise held by other healthcare professionals, and have confidence demonstrating collaborative skills when they enter the workforce. Some examples of my IPE and CP work with students include:

- Serving as a course director for over 400 students enrolled in an interprofessional practice course. The two-semester course includes health professions students from programs for medicine, nurse anesthesia, pathologists' assistant, pharmacy, physical therapy, physicians' assistant, podiatric medicine, and psychology.
- Leading a workshop to train dental and medical students about co-treating geriatric patients with complex health needs. Students were assigned to interprofessional teams and were tasked with evaluating a standardized patient (who presented with both dental and medical concerns), and were instructed to gather the appropriate history and physical, assess the patient's needs, identify a diagnosis and treatment plan, and provide a coordinated sequence for care.
- Integrating dental residents and pediatric medical residents, using curriculum, programming, and collaborative experiences, aimed at increasing access to care for underserved children.

- Participating as a faculty facilitator in a co-institutional, interprofessional team immersion experience for students.
- Designing various interprofessional panels, round table discussions, and lecture series. In a recent talk, a hospital pharmacist provided medical students with an overview about:
    - administration and modifications for medications
    - assessing a patient's response to medications
    - arranging a pharmacy consultation for patients who are discharged from the hospital with new or complex prescriptions
    - understanding how certain medications can affect lab test results
    - overall patient education for medication-associated needs

The examples listed above represent a portion of the work that I have led to instill students with a deep appreciation and awareness for the intersection between their roles. Furthermore, my PhD line of inquiry included an in-depth appraisal of literature, adding to my knowledge and interprofessional understanding.

To look at things from a larger context, health professions programs across the United States are increasingly being required by accrediting bodies to deliver interprofessional education and ensure students graduate with interprofessional skills and are collaborative practice-ready. While this educational reform mandates a significant change in health care education, IPE and CP trained professionals continue to enter the workforce and practice along-side health care professionals who are untrained and unaware of concepts for IPE and CP (WHO, 2010). The absence of training leaves practitioners ill-equipped to apply a collaborative approach to care and makes them less likely to engage with IPE and CP philosophies and methods.

I learned about this unfortunate reality during a conversation with a former student of dentistry. The recent graduate shared an account of an incident in the workplace. He described a situation where he was reprimanded by a seasoned oral surgeon in his dental organization for consulting with the patient's cardiologist about treatment needs. The veteran oral surgeon exclaimed that he had opened himself (and the organization) up for liability and remarked that it was the patient's responsibility to gain information from his physician. The new graduate tried to explain what he had learned about IPE and CP during dental school but was immediately shut down and subjected to listen to the oral surgeon boast about his superiority in knowledge and years of experience. The conversation with the new dentist left me feeling disheartened and wondering if the untrained workforce might undo all the hard work achieved through IPE and CP educational programs. At the same time, it helped outline the premise for this PhD project.

B. Statement of the Problem

While IPE and CP have enriched the education and practical skills for current students and recent graduates from health professions education programs, many practicing healthcare professionals have had little to no exposure to IPE and CP theories and practices. These educational gaps can impede the positive momentum developed through the IPE framework when clinicians educated with IP and CP philosophies enter practice with those untrained in IPE and CP. While studies support the paradigm shift toward collaborative healthcare practice, research focusing on inconsistent collaborative education and training among practitioners in the workforce has been largely overlooked. Generational and philosophical differences held by seasoned practitioners can create additional barriers in promoting advancements for collaborative healthcare education. It is vital to understand the negative impact that untrained, disconnected healthcare models create to address IPE and CP deficiencies across the workforce. Additionally,

comparative data between trained and untrained practitioners can support an urgency for establishing universal IPE and CP proficiency in the workplace.

In 1999, the Institute of Medicine published an eye-opening report, *To Err is Human*, which indicated that approximately 98,000 individuals die each year from medical errors (IOM, 1999). Current data compiled estimates that over 400,000 deaths occur annually from needless mistakes. Prior to the COVID-19 pandemic, medical errors were alleged to be the third leading cause of death behind heart disease and cancer. Medical errors have been attributed to:

- lack of complex knowledge required for diagnosing or treating a particular health condition
- lack of communication between clinicians
- ack of information, unclear information, or misinterpretation of information
- healthcare professionals practicing outside their scope instead of collaborating or referring

To echo these claims, Murphy and Dunn (2010) deemed team-based infrastructure in health care as a key component for patient safety and underscored miscommunication as a primary cause for preventable medical errors. Fein et al. 2007, also reported patient safety concerns regarding communication and disclosure of errors related to a lapse in communication.

Growing apprehensions about patient safety, quality of care, and treatment outcomes highlight the importance of communication, collaboration, and care coordination. Although practitioners often recognize the importance of communicating with other healthcare professionals, effective communication across healthcare teams is not inherent; it is learned. The IPE framework for establishing communication, learning roles and responsibilities, constructing teams and teamwork, and instilling values and ethics, by the Interprofessional Education

Collaborative creates the foundation for training (IPEC 2011, 2016). Purposeful interactions between clinicians encourage collaborative practice and support shared responsibility, promoting favorable patient outcomes.

C. Purpose of the Study

Gaps in research related to IPE and CP among healthcare professionals in the workforce are evident (Lutfiyya et al., 2016). The lack of data also creates challenges for generalizing why the problem exists, comprehensively understanding needs, and effectively outlining strategies for improvement. An exploratory study can launch an investigative process and give rise to future research to improve healthcare delivery. The specific aims for conducting this exploratory study are:

1. Identify the *absence, or presence (including rigor)* of formal IPE or CP education and training
2. Assess basic IPE and CP knowledge
3. Understand values for IPE and CP
4. Gauge confidence-level in demonstrating IPE and CP skills [among licensed dental, medical, nursing, and pharmacy healthcare professionals]
5. Assess interest-level in post-licensure IPE and CP training, weigh attitudes about mandatory IPE and CP training for re-licensure and identify preferences for various learning platforms (asynchronous computerized modules, synchronous webinars, in-person lectures, panel, and round table discussions, role play, and simulation activities)

The premise for these objectives is supported by the literature reviewed in Chapter 2.

D. Significance of the Study

Studies in IPE and CP focus predominantly on educational settings for health professions students. In contrast, this study aims to explore perspectives of practitioners in the workforce. Without support for universal standards for converting and translating IPE and CP skills to practice, it is difficult to assume that all healthcare professionals see these concepts through the same lens. Nevertheless, comparability of viewpoints between IPE and CP trained, and untrained practitioners can shed some light, provide various perspectives, and identify specific needs. Furthermore, the data from this research can add to the current body of knowledge to improve healthcare delivery and patient outcomes.

The study examines whether knowledge-base, perceived skills, and values for IPE and CP differ among healthcare professionals who received formal IPE and CP training compared to those who did not receive formal training. Formal training in this study is defined by the level of rigor involved in the training. Although the study focuses on comparisons between IPE and CP trained and untrained practitioners, information gained from this project can also evaluate whether pre-licensure IPE and CP training translate to post-licensure practice. Additionally, the data can identify whether demographic factors influence IPE and CP knowledge, skills, and values. This exploratory study is designed to examine findings, evaluate practical and clinical IPE and CP deficiencies among untrained professionals in the workforce, and outline opportunities for training.

The findings might directly benefit the UIC Department of Medical Education (DME) by contributing to the discourse for enhancing IPE and CP curricula within the Professional Development and Certificate Programs and the DME Continuing Education Program. The study outcomes might also benefit educators and serve as a conduit for future research about IPE and

CP among clinicians in the workforce. The end goal for IPE and CP is to optimize the delivery of comprehensive, collaborative care through a team-based approach and ultimately improve patient outcomes.

CHAPTER II. LITERATURE REVIEW

This literature review explores the historical background and current research specific to IPE and CP across dental, medical, nursing, and pharmacy programs. The synthesis of collected work is designed to highlight problems in healthcare due to underdeveloped interprofessional and collaborative skills, to review the evolution of interprofessional education, to outline varying models for IPE and CP training, to underline gaps in interprofessional and collaborative practice education and training as it relates to practitioners in the workforce, and to delineate strategies for applying IPE and CP skills into daily clinical practice.

The UIC Library and databases were used to access Cochrane Library, Google Scholar, PubMed, Scopus, and Web of Science search engines. Search terms included: interprofessional, interprofessional education, interprofessional collaboration, interprofessional communication, interprofessional practice, collaborative practice, multi-professional, interdisciplinary, dental education, medical education, nursing education, pharmacy education, healthcare professionals, healthcare teams, interprofessional curricula, and interprofessional models, pre-licensure IPE, post-licensure IPE, continuing education, and IPE. Additionally, reference lists from IPE research and information from Interprofessional organizations were utilized to gather data. Finally, articles were appraised for content relevant to IPE, CP, and care delivery.

A. Background

Many recent studies found concrete evidence to suggest that no single health profession can advance patient care on its own. Optimal healthcare delivery is dependent on collaboration that spans across practitioners from varying disciplines and professional backgrounds (Zanotti et al., 2015). Patient outcomes rely on health professionals' performance and their ability to collaborate and function as a collective unit (McPherson et al., 2001). In healthcare, patient-clinician

relationships begin with an initial assessment, which provides a basic framework, identifies current health status, and directs treatment needs. The next step involves activating care placing critical decisions in the treating practitioners' hands. These decisions often require a multifaceted approach to support the optimal delivery of comprehensive care.

Demands for exercising collaborative practice have emerged significantly in recent years. As members of the aging population continue to multiply, healthcare professionals face patients with complex health needs, typically extending beyond their disciplines and scopes of practice (Greer et al., 2014). In 2011, Chadi reviewed the scope of practice for physicians, nurses, pharmacists, and other health professionals and highlighted skills and levels of expertise that cannot be delivered effectively by a single practitioner (Chadi, 2011). For example, a pharmacist holds a greater understanding of pharmacokinetics than a general practitioner, thus would stand more qualified to investigate concerns related to drug interactions. Collaborative practice philosophies challenge the historical boundaries that have separated health professionals and serve as agents for channeling expertise.

In the past decade, healthcare advocates have raised concerns about patient safety, delivery of comprehensive patient care, and risks for medical errors due to poorly developed communication skills and collaborative training for healthcare professionals (Pechacek et al., 2015, Thomas et al., 2000, 2012). A study from the Southern Illinois School of Medicine looked at errors attributed to *information transfer and communication* (ITC) to better understand patient safety issues in surgical settings (Williams et al., 2007). Their multi-institutional project's specific aim was to examine the *information transfer and communication* workflow of surgeons and other health professionals and map processes [which led to adverse events] to minimize or prevent future errors. Data were collected using direct observation, focus groups, and web-based surveys.

The combined data produced 328 case descriptions, categorized based on the incident caused. Incidents were labeled into four categories:

1. Blurred boundaries of responsibility
2. Decreased surgeon familiarity with patients
3. Diversion of surgeon attention
4. Distorted or inhibited communication

Subcategories were also created to adjust for other contributing factors like fatigue and shift changes. Finally, the communication failures were mapped to poor patient outcomes and exposed: delays in patient care delivery, time inefficiencies of providers, and overall serious adverse events. While unfortunate, this study's data gave rise to the development of several principles and institutional habit changes designed to enhance communication and intended to improve patient outcomes.

In 2014, the *Joint Commission on Accreditation of Healthcare Organizations* (JCAHO) published a Sentinel Event Alert to discuss reports submitted for 47 cases that resulted in prenatal death and permanent disabilities (JCAHO, 2004). The report provided detailed information about the "root cause" for the tragedies, citing a staggering 72% were related to professional error. These errors were explicitly tied to a lapse in communication, leaving healthcare providers unclear about their roles and how they contributed to delivering team-based care. Similar concerns related to interprofessional collaboration, communication, and patient safety have resonated throughout health professions education programs, eliciting calls for action. Most health professions programs have some degree of training related to interprofessionalism, but evidence of how IP training integrates into the workforce is largely unknown.

The following sections review IPE and CP from an educational context and a workforce context and expand upon bodies of work that lend to the research focus. Theoretical perspectives that helped guide and justify the framework for this exploratory study are discussed. Tables are used to help summarize relevant, supportive research. A final summary blends the understood outcomes and explains the methods for this study.

1. Education Context: History of Training Programs for Health Professionals

To fully comprehend the strengths and weaknesses of interprofessional education formats and understand how training translates into practice, it is essential to have a wide-ranging perspective about clinicians' history and evolution. Historically, health professionals' training programs have occurred in silos, focusing predominantly on the direct rigors of that specific discipline (Kumarasamy & Sanfilippo, 2015; ACTPCMD, 2012; Nexus, 2020). Health professions programs have been designed to cover practical and theoretical content within a tightly packed curriculum. Shortly after admission, students begin developing professional identities, which separate them from other health professionals. As structural hierarchies are formed, another divide is created (Foronda et al., 2016). Next, demands for memorizing and understanding complex course materials lead to independent study requirements, thus influencing more isolation. Program logistics, limited synergistic coursework, and specialized spoken and written technical languages further segregate health professions students. Academic infrastructure and resources can create additional boundaries and challenges. Finally, health professions students begin to hone in on general, specialty, and subspecialty skills, making it difficult to shift the focus outside their profession (Nexus, 2020). Based on the aforementioned, students often have difficulty intercorrelating IPE and CP concepts within their individual professional identity as healthcare team members. Likewise, collaborative educational

deficiencies have been apparent for decades, prompting several advocacy groups to establish initiatives focused on redesigning the health professions training model.

a. IPE and CP Advocacy

i. Institute of Medicine and Interprofessional Education

The Institute of Medicine (IOM) was established in 1970 as a nonprofit, unbiased organization to serve as an advisory council for decision-makers and the general public. They began looking at the healthcare workforce and started outlining opportunities for improvement (IOM, 1972). The IOM immediately identified concerns related to health professions education and by 1972 had established the *Committee on Education in the Health Professions* to lead the charge. On October 2, 1972, the Committee held a conference in Washington, D.C., on the *Interrelationships of Educational Programs for Health Professionals* to begin exploring how team-based health care might be taught. Representation included 120 leaders across major health professions. Six questions were posed at the conference, and attendees were situated into small groups to discuss and provide overall feedback. The questions were:

- Why educate teams?
- Who should be so educated?
- How should students be educated (classroom emphasis)?
- How should students and professionals be educated (clinical emphasis)?
- What are the requirements for educating health care delivery teams?
- What are the obstacles?

The Committee later compiled findings and published the report titled "*Educating for the Health Team"* to share conclusions and make recommendations based on three levels: administrative, teaching, and national. The administrative focus endorsed developing a

consortium to lead discussions about IPE, teamwork, and methods for optimizing patient care. The teaching component proposed classroom and clinical opportunities to stimulate interdisciplinary collaboration, foster development for new skills, and offer preparation for potential barriers. Finally, the national level looked at establishing a clearinghouse to serve as a repository for data related to IPE and healthcare team models within educational settings. The information and statistics were also disseminated to gain governmental support for future innovations. Overall, the conference was proven successful in outlining directives for advancing IPE.

Efforts from the IOM continued to flourish over the next two decades, during which newfound opportunities for improvement started to surface. In 2001, the IOM published the report, *Crossing the Quality Chasm: A New Healthcare System for the 21st Century*, which formally restructured an interprofessional, team-based approach for delivering care in a safe, effective, patient-centered, timely, efficient, and equitable manner (IOM, 2001). In 2003, the *Health Professions Education: A Bridge to Quality* report emphasized evidence-based practice for improving patient outcomes (IOM, 2003). By 2015, the IOM had sharpened its focus and published a paper entitled: *Measuring the impact of interprofessional education and collaborative practice and patient outcomes* (IOM, , 2015). The IOM's work has been instrumental in paving the way for healthcare collaboration, establishing guiding principles for IPE, and adapting to transitions across the health professions.

ii. Interprofessional Education Collaborative

In 2009, the Interprofessional Education Collaborative (IPEC) was formed as a coalition between six national associations representing schools for health professions to identify education needs for improving team-based delivery of patient care and enhancing population

health outcomes (IPEC, 2016). In 2016, nine new [institution member organizations] joined the alliance, providing more comprehensive representation across health professions and a greater support system. Fittingly, IPEC outlined "competencies," to serve as a framework and guide practitioners toward a patient-centered approach to delivering care. The IPEC model identifies four “core competencies,” with each holding specific sub-competencies. The four core competencies are:

- Values and Ethics for Interprofessional Practice
- Roles and Responsibilities
- Interprofessional Communication
- Teams and Teamwork

The sub-competencies provide an additional itemization of characteristics and behaviors that signify aptitude within that domain. Appendix A illustrates the four core competencies, the sub-competencies, and definitions that align with each descriptor. These competencies and sub-competencies currently serve as the basis for IPE and CP proficiency. In 2011, a revised IPEC report was published that reflected more of a unitary concept of interprofessional competency, also supported by the work of Hasnain et al (2017).

iii. *The World Health Organization (WHO)*

In 2010, the WHO released the *Framework for Action on Interprofessional Education and Collaborative Practice,* expanding upon collaborative concepts to identify global strategies (WHO, 2010). The framework includes methods that have influenced successful collaboration and team-based care models worldwide. In order to move flawed health systems into cohesive models for care, practitioners must be adequately trained to work as a comprehensive healthcare team. Mechanisms for training, support, and assessment are highlighted, and the importance of

organizational policies is emphasized. The framework provides the tools to effectively introduce and execute IPE and CP models within various settings. It serves as a road map for becoming an active leader and advocate in the interprofessional movement.

b. Comparing models used to train health professions students

Based on decades of work and countless research studies, the need to develop IPE and CP models, and ensure healthcare professionals' proficiency and preparedness, remains at the forefront of health education reform. The paradigm shift toward comprehensive healthcare has gained positive momentum, focusing on a combined care method involving practitioners from multiple disciplines (Baker et al., 2008). Though accrediting bodies for dentistry, medicine, nursing, and pharmacy all require institutions to prove that they are demonstrating interprofessional education practices, models for delivering IPE and incorporating CP vary drastically across programs and colleges. A summary of pre-licensure IPE and CP literature, which looks at models and methods for delivering and assessing IPE and CP among students, is presented in Table I.

TABLE I- Pre-licensure IPE and CP Literature

Author(s), year, & title	Main objectives	Participants/ setting	Methods of data collection	Key findings
Parsell & Bligh (1999) The development of a questionnaire to assess healthcare students' readiness for interprofessional learning [RIPLS]	Measure consistency and reliability of an assessment tool	120 students	Questionnaire	The tool helps assess attitudes toward IPE but has been adapted several times to provide greater validity

Hobgood et al. (2010) Teamwork training with nursing and medical students: does the method matter? Results of an interinstitutional and interdisciplinary collaboration	Understanding whether a method of IPE and CP delivery matters	436 students (nursing & medicine)	Pre/post questionnaire	Team attitudes improved after collaborative activities were completed
Bridges et al. (2011) Interprofessional collaboration: three best practice models of interprofessional education	Reviews varying models and best practices for IPE and CP	Three universities	Program review	Administrative support, program infrastructure, committed faculty, and student recognition are key components for IPE program success
Campion-Smith et al. (2011) Can sharing stories change practice? A qualitative study of an interprofessional narrative-based palliative care course	Professional behavior and improved patient outcomes	Doctors, nurses, social workers, & emergency care practitioners	Interviews	Professional behavior changes were achievable and sustainable
Buckley et al. (2012) Developing interprofessional simulation in the undergraduate setting: experience with	Learning collaboration through simulation	191 students from 2 universities	Simulation	Sessions helped with understanding team-based care and increased confidence of participants

five different professional groups				
Hasnain et al. (2017) Development and validation of a tool to assess self-efficacy for competence in interprofessional collaborative practice	Testing an instrument that assesses perceived confidence in demonstrating IPE skills	660 students across 11 health professions programs	Questionnaire	The questionnaire was found to be a valuable tool but needed refinement. A follow-up study offers modified versions of the IPECC-SET

i. *Pre-licensure IPE and CP models*

Bridges et al. (2011)

In 2011, Bridges et al. looked at three best practice models, appraising unique approaches for collaborative healthcare education. The first model reviewed was from Rosalind Franklin University of Medicine and Science (RFUMS). In 2004, RFUMS instituted an *Interprofessional Healthcare Teams* course for all first-year health professions students. This course held three separate elements: a didactic component, a service-learning component, and a clinical component. Approximately 480 students participated, representing allopathic and podiatric medicine programs, clinical laboratory, medical radiation, nurse anesthetists, pathologists' assistants, psychology, and physicians' assistants. Students were assigned to a 16-member interprofessional team to work with over the semester. For the didactic component, teams met weekly for small group learning activities, focusing on team-based care and the roles and responsibilities of each healthcare team member. The service-learning element charged teams with participating in a community project. Finally, the clinical component placed students into smaller groups of four to apply their team-based care knowledge within an actual clinical site.

Once all three components were completed, the students progressed to a 1-credit, *Culture in Healthcare* course, with their original 16 team members, to be trained on the importance of understanding culture when providing patient care. At the end of these courses, focus groups were held to gain experiential feedback from the students. Comments supported a positive experience, and students self-reported a collective increase in knowledge and understand about interprofessional communication and teamwork.

Next, Bridges et al. (2011) reviewed a program housed in the Office of Interprofessional Education at the University of Florida. This program established an Interdisciplinary Family Health (IFH) course required for all first-year students in the following colleges: medicine, dentistry, pharmacy, nursing, physical therapy, psychology, nutrition, public health, and health professions. By design, three students were appointed to each IP team. Next, teams were tasked with conducting four home visits with underserved families in the Gainesville area over two semesters. The goal was to identify the impact that interprofessional teams and collaborative care efforts had on the community. In addition to the community care component, didactic coursework delivered content on patient care, interpersonal and communication skills, and professionalism. The course further challenged students to apply a forward-thinking approach. Each team was required to complete a portfolio and present it to their assigned family. The family then offered an evaluation and shared their perspectives about the effectiveness of the home visits. At the end of the IFH course, each student was expected to write a reflective paper to document their experience. Finally, faculty and students completed online evaluations to provide course feedback evaluated for course improvements. Like the RFUMS study, most survey responses indicated positive outcomes from participation.

Bridges et al. (2011) appraised the final model from the Center for Health Sciences Interprofessional Education (CHSIE) at the University of Washington, which offers more than 50 courses that integrate health sciences students in a team learning environment. University curricula enabled students to demonstrate team-based skills (like communication, leadership, roles and responsibilities, and situational monitoring) in an urgent care, simulation-type setting. To provide real-world experiences, students participated in co-curricular activities through a program called: *Student Providers Aspiring to Rural and Underserved Experience* (SPARX). The SPARX program allowed students to gain experiential learning by attending open forums, lectures, and training exercises to improve underserved communities. SPARX community efforts included health fairs and in-school health screenings, mobile health care for the homeless populations, breakfast programs fostering nutritious eating, and several other programs targeting the needs of the population they serve. Popularity for participation in the SPARX program, along with positive feedback from the community, provided evidence that the program was an invaluable component for teaching concepts of team-based care at the University of Washington.

- Summary

Bridges summarized the comparison between these best-practice models, highlighting the wide variety of experiences for health professions students to learn about their role (and their colleagues') in delivering care. For example, students were taught why communication remains critical in healthcare, in addition to learning about the importance of the team-based approach to patient-centered care. Providing this framework within higher education settings can prepare health professions students to practice collaborative, comprehensive care.

Buckley et al., 2012

Similarly, another author examined IPE and CP at different universities, but this study looked at interprofessional collaboration through co-institutional simulation (Buckley et al., 2012). Students from the University of Birmingham, Birmingham City University, and Worcester Universities participated in half-day sessions using interprofessional simulation techniques. A total of 191 students representing programs for medicine, nursing, physiotherapy, radiography, and operating department practice (ODP), participated in a cross-sectional study that utilized simulation as an intervention in determining outcomes related to students' perceptions and attitudes toward IPE and CP. These sessions provided face-to-face problem-solving scenarios associated with chest pain and respiratory distress. The half-day sessions consisted of interactive manikin simulation, role-play, and peer observation with feedback. In addition, a before and after the questionnaire was utilized to survey students about IP and CP perceptions before and immediately after participating in the simulation sessions. The 30-question survey consisted of a 5-point Likert scale, a visual analog scale (VAS), and open comments. Questions investigated students' confidence level in understanding the roles and responsibilities of interprofessional team members, probed them to identify their comfort level in giving and receiving feedback from members from other health professions, and inquired whether they felt there were benefits in training health professional's collaborative, team-based skills.

Since the half-day simulation sessions provided limited intervention, the researchers anticipated minor changes in students' perceptions. Descriptive statistics were analyzed, pre and post responses were compared for differences, and open responses were coded to identify common themes. The findings suggested that most students felt that the sessions increased their understanding about working as health care team members and introduced better methods for

delivering care through a team-based approach. Additionally, most students felt that sessions boosted their confidence in working with other health care providers. Students felt that video and verbal feedback from peers and facilitators were helpful. The responses to open comments were exceedingly constructive and appreciative concerning input from other professions, but students indicated feeling less comfortable providing feedback. A hybrid of negative comments pointed out a lack of knowledge by other health professionals, which was thought to impede the overall flow of simulation sessions.

- Summary

Long-established hierarchies exist within healthcare, which often intimidates practitioners, creates reluctance toward active and open participation, and stifles collaborative practice (Fanning & Gaba, 2007; Steihaug, 2016). In addition, negative comments related to the lack of knowledge held by other health professions students created barriers. Overall, students in the study felt that the interprofessional simulation sessions provided a beneficial experience that can be applied to improve patient care.

Hobgood et al. (2010)

Efforts designed to compare and critique different approaches for delivering IPE and CP methods across various universities remain challenging. Robust IPE models require resources, funding, infrastructure, buy-in from stakeholders, faculty support, reliable assessment methods, continuous renewal, and sustainability. While it is challenging for educational programs to maintain an equal pace with our healthcare systems' constant evolution, some institutions are more dedicated to collaborative training than others (IOM, 2011). Incidentally, IPE and CP instruction are delivered and evaluated using several methods, prompting researchers to ponder whether the method matters (Hobgood et al., 2010).

In a randomized control trial study, investigators assigned nursing and medical students to participate in one of four teaching methods to evaluate potential changes in attitude when working on an interdisciplinary team. The four methods included: a didactic course (which served as the control), an interactive didactic course, role-play exercises, and patient simulation. A total of 436 students [4th-year medical students and final semester nursing students] participated in a day-long course focused on training healthcare providers to work as teams. Four different instruments were used for teamwork, knowledge, skills, and attitudes utilizing pre-and post-testing. These instruments were:

- Collaborative Healthcare Interdisciplinary Relationship Planning test (CHIRP)- 36-items Teamwork Attitudes instrument
- Teamwork Knowledge test -12-items
- Standardized Patient Evaluation (SPE) of teamwork skills performance -10-item case specific
- Mayo High-Performance Teamwork Scale (MHPTS) - 20-item modification

Analyses of variance (ANOVA) tests were conducted to compare the cohorts. The findings showed that students who participated in the one-day, interdisciplinary event exhibited significant improvements in teamwork attitudes. However, remarkably, when comparing the teaching methods delivered for each cohort, there were no significant differences in gains based on a specific teaching method.

- Summary

While Hobgood et al. (2010) used various methods to compare outcomes for IPE learning, the study's results expound upon the question, does methodology matter? Many would stand firm that some sort of IPE and CP training is better than none at all. With several studies

challenging the notion that high-tech, sophisticated IPE activities produce the best outcomes or generate the soundest data, researchers often return to primary interventions to deliver and compare concepts.

Campion-Smith (2010)

In a 2011 article, Campion-Smith explored whether the simple sharing of stories between healthcare providers could elicit synergistic professional behavior and improve patient outcomes (Campion-Smith, 2010). Doctors, nurses, social workers, and emergency care practitioners took part in a series of IP palliative care seminars, which called on participants to share professional experiences within small groups, using narratives, with participants sharing stories from their professional expertise in facilitated small groups. Course evaluators later conducted phone interviews with participants to identify behavioral changes. Respondents recounted positive aspects of the seminars and reported personal development, which had benefited patient care. Five months after the course had ended, many participants testified that professional behavioral changes were found to be easily adaptable and sustainable.

- Summary

The study reviewed the process of professional collaboration through the sharing of stories and anecdotal experiences. Whether practitioners in this study actually gained knowledge about other health professions through interaction or simply used their community of health care professionals as a sounding board is somewhat unknown. However, the benefits of collegiality and health care advantages are indisputable when practitioners converge to meet a common goal.

c. Assessing IPE and CP Learning

With the ongoing expansion and renewed curriculum focusing on IPE, health professions programs struggle with appropriate methods for assessing IPE's effects on the learner (Reeves et

al., 2017). As educational outcomes and milestones continue to serve as key indicators for understanding a student's competency level, patient outcomes function as an essential guiding principle for IPE effectiveness. Interestingly, research is limited to supporting best practice models assessing IPE, thus opening the door to many study designs and countless intervention opportunities for researching IPE and CP. While IPE and CP are designed to positively impact our healthcare system, measuring methods for success remains weak and unclear. Patient outcomes seem to be one of the primary guiding principles for understanding team-based care's benefits, but the process lacks a validated instrument to offer generalizability and confirm effectiveness (Cooper et al., 2001; Thannhauser, 2010; Batalden & Davidoff, 2007). Measurements in research often utilize collaborative competencies or milestones to understand when individuals exert interprofessional learning skills. This type of data typically has qualitative underpinnings that focus on participants' attitudes, perceptions, and values. At the same time, self-efficiency is often viewed as being highly opinion-based. Methods for removing such bias have been exercised throughout the development of newer assessment tools and continue to be researched to identify weaknesses and establish improvements.

Accordingly, faculty from the University of Illinois at Chicago (UIC) developed and tested a new tool to evaluate health professions students' self-assurance in practicing IP and CP skills and gauged the usefulness of the instrument's psychometric properties (Hasnain et al., 2017). The IPEC Core Competencies provided the basis for assessment and measurement criteria, giving rise to the Interprofessional Collaborative Competency Self Efficacy Tool (IPECC-SET) tool. To test the IPECC-SET instrument, a cross-sectional pilot study was designed, comprised of a sample of 660 students representing eleven health professions programs. The students completed a 36-item questionnaire, which represented the piloted IPECC-SET tool, before participating in a

full-day IPE immersion workshop and was completed again after they finished the immersion experience. Rasch analysis was then used to weigh:

- Functioning of the instrument
- Fit of items within each subscale
- Person response validity
- Person-separation reliability
- Differential item functioning concerning gender and ethnicity

The inquiry revealed seven items that were determined to be inadequate but found subscales helpful in exhibiting high internal validity and learned that the tool was adept with differential item functioning. The pilot study equipped researchers with fundamental data for modifying and subsequently adopting the tool. Preliminary evidence supported the use of the IPECC-SET 38 as a valid instrument for measuring health care providers' confidence in demonstrating IPE and CP skills. The research team later refined the tool and condensed the questionnaire into a 27-item scale. Considering additional findings, an even shorter 9-item scale questionnaire supported the efficacy for measuring perceived competence in interprofessional collaboration (Kottorporp et al., 2019). The IPECC-SET in currently being translated in multiple languages; a study of the Swedish translation of IPECC-SET 9 tested 159 students in the 3-year Bachelor Programs in Nursing and in Biomedical Laboratory Science (Axelsson et al, 2022). The Swedish IPECC-SET 9 demonstrated sound psychometric properties.

Another assessment tool frequently utilized in IPE and CP research is the Readiness for Interprofessional Learning Scale (RIPLS). The RIPLS instrument was established in 1999 to measure the attitudes of both health professions students and professionals about interprofessional learning (Parsell & Bligh, 1999). The pilot survey was administered to 120

students representing healthcare programs for dentistry, medicine, nursing, physical therapy, occupational therapy, orthopedics, and radiography. Following the survey, principal components were analyzed. Variance testing was applied for each survey item, resulting in questionnaire modifications to support reliability for content consistency and high internal validity. The finalized version of RIPLS consisted of a 19-question survey which used a 5-point Likert-type scale, prompting participants to respond with: strongly agree (1), agree (2), neither agree nor disagree (3), disagree (4), or strongly disagree (5) to statements related to attitudes and perception about shared interprofessional learning. Since then, this tool's countless adaptations have been developed, with many using reverse scoring of the scale to reflect weights more closely aligned with the responses and text fields for open-ended feedback.

While there is no shortage of options for obtaining IPE and CP assessment tools, debates circle around certain assumptions drawn by various methods (Mahler, Berger, & Reeves, 2015). In 2015, in response to confusion over the growing number of assessment tools, the National Center for Interprofessional Practice and Education (NEXUS) published a validity discourse for instrument selection (Schmitz & Cullen, 2015). The "primer" document was developed to assist researchers in selecting an appropriate measurement instrument. In addition, the manuscript encouraged researchers to identify the focus of the study's outcomes as a directional path for choosing an assessment tool. Categories for evaluating IPE and CP education outcomes included knowledge, skills, behavior, and affective states. Additionally, respondents' categorization was highlighted to specify differing needs between evaluating individual, team, and organizational responses. Finally, five sources were established to guide instrument selection for validity evidence through the content domain, response processes, internal structures, and relationship to other variables. While helpful in selecting a suitable method for assessing interprofessional and

collaborative skills, knowledge, and attitudes, Schmitz and Cullen do not claim to have all the answers for accurate, foolproof evaluations.

Researchers continuously search for a gold-standard assessment tool to measure IPE and CP proficiency and effectiveness. Unfortunately, decades of data have proven that no single instrument can satisfy all IPE and CP measurement needs. As tools continue to be problematic, a hybrid of instruments is often adapted to capture the necessary data. Defining the purpose of the measurement is crucial in guiding instrument selection and consideration for appraising validity. NEXUS currently shares a collection of measurement instruments in an open-source repository to help researchers choose the appropriate tool to align with their study focus.

Looking at the educational context, many teaching strategies provide innovative and meaningful IPE and CP experiences for health professions students. IPE embedded curriculum lays the foundation for students and aims to instill collaboration, communication, and team-based care. The over-arching goal is to manifest IPE that shifts from an educational context and is adapted and applied to workforce practice. An effective succession from education to workforce allows IPE and CP to take another step forward and evaluate impacts on healthcare delivery and patient outcomes.

2. Workforce Context: Post-licensure IPE and CP Training

a. Post-licensure IPE and CP Gaps

Interprofessional education is said to be the catalyst for interprofessional practice. What sort of impacts do providers who never received IPE training face? Does their lack of training impact patient outcomes? The need for advanced collaborative healthcare skills was never more evident than it became in 2020. COVID-19 presented as a novel virus, which led to a global pandemic and shined a spotlight on the team approach to healthcare (Langlois, 2020).

Government officials publicly solicited health care providers, both active and retired, to support a surmounting demand for help. The reality, linked to the inability to control the virus, met the nation with greater pause. The actuality that no single health care discipline can solely address needs across a continuously changing healthcare system became suddenly and unquestionably clear. As physicians, nurses, respiratory therapists, imaging specialists, epidemiologists, laboratory scientists, psychologists, psychiatrists, and social workers encompass a large portion of COVID-19 team-based care, many other clinical, administrative, and governmental representatives have played a significant role. The COVID-19 pandemic emphasizes the importance of collaborative care and validates the presumption that combined actions delivered by health care teams are more than the sum of their parts.

While the pandemic forced many practitioners into learning about interprofessionalism, understanding the basic concepts and theories remains essential for everyday clinical practice. Interprofessional learning is a practice that applies to health care practitioners both before and after they enter the workforce (Reeves et al., 2012). Although collaborative care opportunities for *student-based healthcare delivery* continue to grow, this phenomenon has not followed the same development pattern for licensed professionals in practice. The WHO, *Framework for Action on Interprofessional Education and Collaborative Practice* describes the "collaborative practice-ready workforce" as having healthcare workers equipped with appropriate IPE training. Yet, veteran clinicians often lack IPE and CP education, making it challenging to implement these philosophies' and maintain the drive toward advanced practice (WHO, 2010). A summary of post-licensure/workforce IPE and CP literature is presented in Table II.

TABLE II- Post-licensure IPE and CP Literature

Author(s), year, & title	Main objectives	Participants & setting	Methods for data collection	Key findings
Curran, Sharpe, & Forristall (2007) Attitudes of health sciences faculty members toward interprofessional teamwork and education.	Reviews attitudinal barriers for change	Faculty practicing in an institution setting	Survey	Baseline attitudinal measures are essential to understand before working toward change.
Weaver et al. (2010) Integrating the science of team training: Guidelines for continuing education.	Continuing education for practitioners in the workforce	Articles and evidence spanning 30 years	Scoping review	IPE and CP continuing education is essential for untrained practitioners. Buy-in from stakeholders is vital for sustainability
Burley (2016) Advancing interprofessional education: a quantitative study exploring interprofessional learning orientations in a post-licensure and advanced practice degree.	The role that age and tenure in profession play in interprofessional learning	53 nurses in the post-licensure program	Survey tools (RIPLS and GSE	Nurses supported IP training for practitioners
Paige (2019) The evolving role of the pharmacist in interprofessional practice.	IPE continuing education for licensed clinicians	Review of articles licensed pharmacists	Review	IPE training is critical to the advancement and integration of pharmacists as members of the healthcare team

b. Post-licensure/workforce IPE and CP models and assessment methods

The silo mentality that most health professionals are trained within can also create attitudinal barriers to change. In 2007, a study linked obstacles for successful IPE implementation with attitudes of participating faculty (Curran, 2007). In this study, the authors surveyed faculty who actively practiced in their professions, representing departments of medicine, nursing, pharmacy, and social work, within an individual institution. Participants were asked to provide ratings of their perspectives about IP training programs and collaborative team training. In addition, appraisals looked at faculty who had formal IPE training compared to faculty who had no formal training. Findings indicated that both experiences with IPE and the gender of faculty played a role in professionals' perspectives, resulting in IP advancement barriers.

In addition to concerns related to variations for formal pre-licensure IPE training, questions consistently remain unanswered about post-licensure differences for IPE and CP based on age, years of practice, and program of study. A recent dissertation shared research aimed at understanding dissimilarities. Burley (2016) asked, "To what extent are the characteristics of age, workplace, tenure in the field, and program of study associated with the interprofessional learning orientations of nurses seeking post-professional or advanced practice degrees?" To answer these questions, the researcher studied registered nurses enrolled in post-licensure and advanced degree programs. The study used a convenience sample of 53 nurses enrolled in a post-licensure program at Governors State University to learn about their interprofessional learning (IPL) orientation after being in the workforce. Two different survey tools (Readiness for Interprofessional Learning Scale [RIPLS] and the Generalized Self-Efficacy Scale [GSE]) were

modified and utilized to gather data. The survey posed 26 questions using a Likert scale focused on IPL skill confidence and IPL values. Additionally, data was gathered related to career factors (age, tenure, workplace, and program of study). The study found that previous IPL experience positively impacted the confidence of skill and values for IPL. The nurse's age and program of study also showed a positive correlation to IPL. The study concluded that overall, nurses favor interprofessional learning and requirements for using interprofessional activities to train practitioners.

Current research also points toward the critical nature of knowledge translation related to healthcare delivery (Thomas, 2014). In a recent article, authors at Campbell University described the importance of "continuing education for seasoned healthcare providers" (Paige, 2019). They referred to continuing professional education as CIPE and endorsed the benefits of including enhanced IPE and CP, improved cultural competence levels, and increased compassion for patients' values. Their recent CIPE event focused on pain management and addiction concerns through a day-long opium symposium. Participants included pharmacists, physicians, physician assistants, nurses, nurse practitioners, and social workers. The positive feedback regarding this event highlighted the importance of collaboration in patient care and the positive impact that it can have on patient outcomes.

In 2010, Weaver et al. discussed the importance of continuing education [among professionals already in the realm of practice] to develop appropriate attitudes, behaviors, and skills to function as an effective healthcare team. The article drew on more than three decades of evidence-based practice to outline essential core competencies for collaborative healthcare. Moreover, they stress the importance of teamwork and communication to enhance patient safety and promote lifelong learning as a continuing education platform. Furthermore, the Institute for

Healthcare Improvement, Lucian Leape Institute, maintains that incentivizing continuing education as a resource for performance improvement can create a pathway to improved patient safety and healthcare processes.

To maintain and renew professional licensure, all healthcare providers must complete a set number of continuing education credits during a specified period. Requirements are typically defined under state statutes, outline specific content requirements, and define rules for delivery of continuing education courses (i.e., online platforms versus live, in-person). The Illinois Department of Federal and Professional Regulation (IDFPR) serves as the governing body for approving licensure for healthcare professionals who practice in the state of Illinois (IDFPR, 2020). Like other agencies, IDFPR outlines specific continuing education requirements based on particular licensure. A review of license renewal requirements for dentistry, medicine, nursing, and pharmacy indicated no mandated or recommended courses outlined for IPE or CP. These findings sharply conflict with current theories for effective and competent health care delivery. The literature above affirmed that students currently enrolled in health professions [through accredited healthcare institutions] must learn IPE. Conversely, licensed healthcare professionals are not required to learn IPE concepts or CP skills to practice and maintain licensure. It seems that discipline-specific organizations and associations remain equally lax in promoting IPE and CP. A brief review of national meetings [hosted by the leading organizations in healthcare] showed a lack of continuing education opportunities outside the specific meeting's discipline. For example, the Chicago Dental Society's Midwinter Meeting is the third-largest dental meeting in the world (CDS, 2020). In 2020, over 28,000 dental professionals attended the conference, which offered more than 250 continuing education courses over three days. However, none of the courses included interprofessional education or collaborative practice topics. Relevantly, in an

article published in the Journal of Continuing Education in the Health Professions, Simmons and Wagner argue that IPE and CIPE are lacking in the clinical workplace and blame both access and resources for the deficiencies (Simmons & Wagner, 2009). If continuing education is not readily available to practicing clinicians, it is increasingly difficult to transfer these concepts into healthcare settings.

3. Summary of Education Context and Workforce Context

IPE and CP have been researched significantly and educational programs have undergone considerable changes since IPE and CP were introduced. Studies have evaluated IPE and CP program design, implementation, and evaluation processes. Researchers have not only reviewed IPE and CP competency, but they have also looked at students' perceptions and values. Outcomes and study findings shine a positive light on the importance of IPE and CP instructional procedures as part of a health professions program's curricular component.

Conversely, studies focusing on IPE and CP among licensed practitioners in the workforce are disproportionate to pre-licensure research. Even though IPE and CP training is unarguably beneficial for delivering team-based care, there is still a great deal to learn about the workforce model to achieve universal, consistent, reproducible education and training. Based on an inventory of studies in this chapter, I was able to form a strategy to expand upon healthcare professionals' IPE and CP knowledge and values and explore opportunities for enhancement. Given variability between educational and workforce models, I also reviewed theoretical perspectives to guide and justify my study design. The following section will review theoretical perspectives and conceptual frameworks appraised within interprofessionalism practices.

B. Theoretical Perspective

Interprofessional Education is a pedagogical approach to health professions education that utilizes team concepts to amalgamate the delivery of patient care (Buring, 2009). Although it was established in the 1980s, it was not widely recognized until much later. Moreover, higher education programs for health professionals still lack consistency in terms of team-based training. While it is essential to understand the background of IPE and recognize the evolution into clinical practice, the theoretical perspective provides deeper roots and defends the argument and need for a team-based approach to healthcare.

Existing information about IPE and CP was initially developed based on statistical data and historical knowledge. Historically, health professions programs have been delivered discretely independent from one another (Brown, 2009). Statistics have shown that the absence of collaborative training increases risks for medical errors, decreases optimal patient outcomes, increases costs across the health care system, and limits access to care (IOM, 2015). This type of data and historical knowledge has led scientists, social scientists, and philosophers to analyze the problems deeply and theorize about methods for creating change. As a result, many theories exist and currently serve as the main driver for interprofessional education and collaborative practice designs.

It is known that interprofessional collaborative practice does not occur as an inherent trait (citation?); instead, it is learned through education and experiences. Constructivism is an educational theory that attributes one's actions and behavior to the individuals' lived experiences (Philp, 2011). Jean Piaget introduced it through his cognitive development theory. This theory outlined that cognitive development occurs when outside influences and interactions construct

knowledge. Correspondingly, he identified four stages of knowledge development. The idea begins with concepts learned during childhood and progresses throughout the lifespan.

In a 2016 study, these constructivism-based concepts were linked to interprofessional teaching theories (Dahmen et al., 2016). Students from medicine, nursing, and physiotherapy programs were provided a clinical case and vignette during an interprofessional course. They were asked to complete a video role-play activity that involved "acting out" the case. Upon completion, students were provided individual time to review their videos and were prompted to complete a written reflection. Instructor feedback and a group debrief were also offered. The outcomes for this process unveiled broad knowledge and distinct values that were attained through self-assessment. Students could watch their behaviors play out as members of a collaborative team and reflect upon their mistakes. This learning process was based on their experiences as health care team members and validated the theory of constructivism. Through a similar thought process, phenomenology exists as a methodology that uses a "1st person" approach to conscious human experiences to understand those particular experiences (Husserl & Gibson, 1962). The old proverb, "seeing is believing," is an excellent example of phenomenology.

C. Conceptual Framework

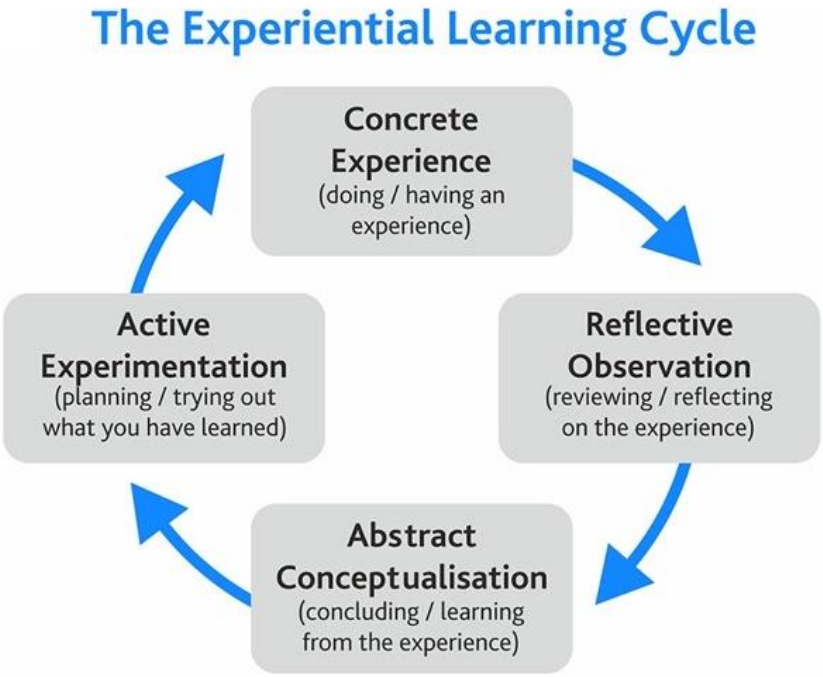
Theories for IPE and CP share many mutual objectives for predicting patient outcomes. Since outcomes rely heavily on the knowledge, skill, behavior, and attitudes of the individuals who provide care, it is essential to gather insight into the learner's mind's inner workings. Several philosophical theories use a common lens to understand these foundations. This section focuses on learning theories that have applications within IPE and CP. The theories included are Experiential Learning Theory, Adult Learning Theory, Social Learning Theory, and Contact

Learning Theory. While these four theories are discussed [based on their emergence within pertinent literature], my proposal directly aligns with theories for Experiential Learning Theory and Adult Learning Theory.

1. **Experiential Learning Theory**

In a scoping review of organizational and educational theories, Reeves et al. described Experiential Learning Theory as the basis for interprofessional education (Reeves, 2007). This learning theory was first published by David Kolb and is now often referred to as Kolb's Experiential Learning. Kolb states that "Learning is the process whereby knowledge is created through the transformation of experience" (Kolb, 1984, p. 38). He outlined two elements for the learning theory, which included a four-stage learning cycle and four individual styles for learning (Figure 1).

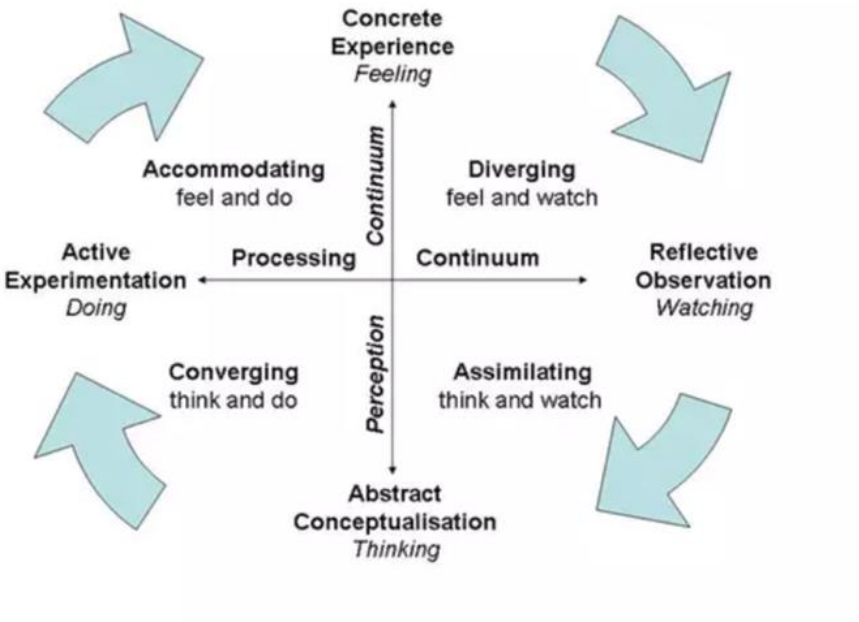
Figure 1- Experiential Learning Theory



https://www.simplypsychology.org/learning-kolb.html

In Kolb's Learning Cycle, learning begins with a concrete experience, transcending the learner through a reflective observation process to an abstract conceptualization stage. Lastly, the cycle for the initial experience closes through the adoption of active experimentation. Along this continuum of learning, Kolb highlights the differing learning styles attributed to different individuals. These explanations serve as the premise for Kolb's affirmations (Figure 2).

Figure 2- Kolb's Learning Cycle



https://www.simplypsychology.org/learning-kolb.html

In 2014, an experimental study used Kolb's theory to understand the effects of continuing professional education on learning (Henson, 2015). The study enrolled twenty-five dental hygienists and used a l6-hour, hands-on continuing education course, focusing on ultrasonic instrumentation as the intervention for this study. The intervention methodology divided the mouth into four quadrants and offered a different activity for each quadrant for intervention comparisons. Subjects were provided a pre-survey designed to assess their existing ultrasonic

instrumentation knowledge for the first quadrant. Responses from the pre-surveys were used to facilitate discussions during the workshop. For the second quadrant, the group was presented with evidence-based research associated with ultrasonic instrumentation, and subjects were presented with a question-and-answer forum. For the third quadrant, a hands-on simulation activity provided subjects with an opportunity to repeat techniques outlined by the facilitator. Finally, they were prompted to create a treatment plan based on what they had learned within their practices for the fourth quadrant. These four distinct intervention processes are designed to model Kolb's experiential learning cycle. It began with the activation of prior knowledge and continued through the cycle to include acquiring new knowledge and concepts, practical application, and closed with synthesis and extension.

Two weeks after the course was over, twelve subjects were asked to participate in audio-recorded interviews. The one-hour interviews assessed the subject's perceptions of their workshop experience. A constant comparative method and coding were used to analyze the data. Findings from the studying were divided by quadrant to fit with the study design, but overall results showed that using a "past, present, future" teaching method was successful.

Like simulation activities, interprofessional experiences provide an ideal channel for Kolb's Experiential Learning to be examined. Simulation in health care is an innovative process designed to mimic actual clinical case experiences. Students are typically presented with a case during a simulation activity, and they are expected to apply their knowledge within health care to implement a process or treatment. Following the exercise, students are debriefed to learn about the strengths and weaknesses of the actions.

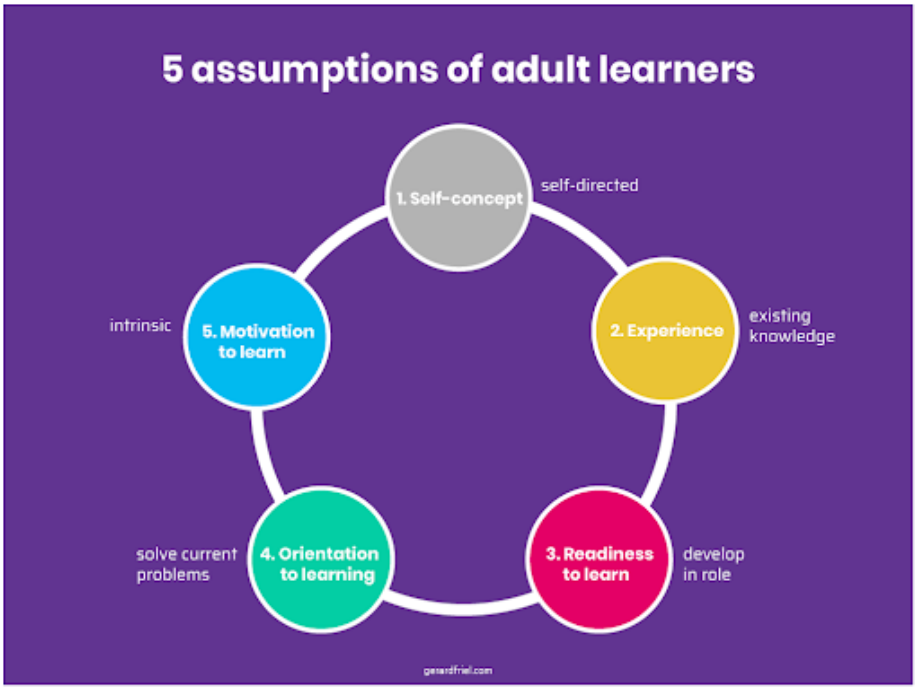
Poore et al. (2014) suggests that interprofessional communication and collaboration can benefit from using Kolb's Learning Theory to guide simulation activities. Applying this theory to

simulation requires students to activate knowledge and critical thinking skills into practice. This event can become an essential learning component and represent the first part of the learning cycle: "concrete experience." Additionally, the debriefing activity offers reflective observation, enhancing behavioral change. Broadly, the application of Experiential Learning in simulation effectively facilitates the interprofessional, collaborative intent for the design.

2. Adult Learning Theory

Another learning theory, widely regarded in interprofessional and collaborative health care, is the Adult Learning Theory. Malcolm Knowles developed this theory in 1968 to individualize and characterize differences between learning processes for adults and children (Knowles, 1980). Knowles Adult Learning Theory, also known as andragogy, represents five fundamental assumptions and four guiding principles (Figure 3.).

Figure 3- Adult Learning Theory



http://www.gerardfriel.com/instructional-design/adult-learning/

The five assumptions are:

1. Self-Concept: Maturation triggers independence and self-direction characteristics
2. Adult-Learner Experience: Maturation propagates life experiences, which serve as a tool for learning.
3. Readiness to Learn: Maturity increase readiness for learning
4. Orientation to Learning: Maturing elicits a change for timing and urgency. Problem-centeredness is applied to evaluation needs for reaction time.
5. Motivation to Learn: Maturity produces a greater motivation to learn.

The four principles are:

1. Inclusive learning process-Adults need to be involved in planning and evaluation for learning
2. Experience- Both positive and negative experiences serve as the core of adult learning activities.
3. Relatable learning: Adults have a greater interest in learning about a subject matter which provides individual relevance and applicability.
4. Problem-focus: Adults' learning is centered more around the problem rather than the content.

To put these concepts into perspective, one can consider the characteristics of an average health professions student. Health professions programs hold pre-eligibility requirements that involve completing a college undergraduate degree or completing a designated list of college pre-requisite courses, therefore, students in these programs represent an adult population and align with the Adult Learning Theory. In 2017, Hammick et al. published a systematic review, which claimed to synthesize twenty-one of the most reliable, most relevant, research articles

focusing on IPE collaboration. The report affirms the theory that states: healthcare professionals who learn together will work more efficiently together. Attention was drawn to studies that utilized Knowles' Adult Learning Theory for their curriculum designs. Additionally, the review pointed to these designs' benefits when understanding nuances related to team learning. Finally, the process for reflection was attributed as a substantial component of learning.

Merriam et al. (2007) also review the benefits that adult learning has on IPE and CP. It has been reported that adults see themselves as active learners. As a result, they seem more inclined to learn new things and agree more with participating in contemporary programs. These active learner attributes align directly with the desired characteristics of IPE and CP students. The problem-centered focus on adult learning is also a strength. Interprofessional training is designed to teach skills that help address issues identified as weakness or designated as "a problem."

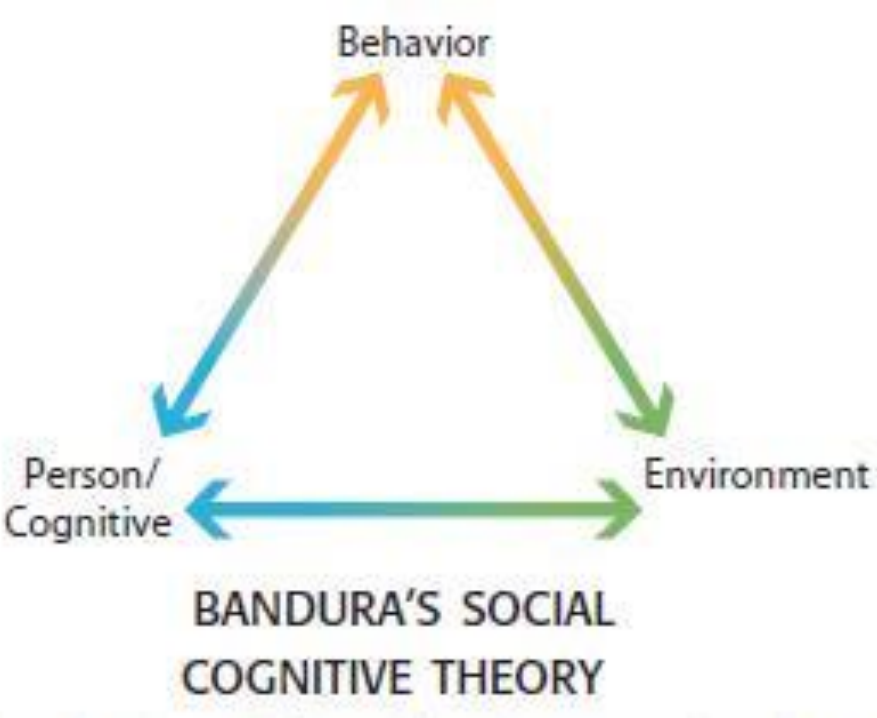
A study out of Quebec used Knowles Adult Learning Theory as the framework for creating an interprofessional training program for Primary Care (Pare, 2012). Concerns over the growing number of patients presenting to Primary Care Departments with complex medical needs prompted this inquiry. Students from differing health care disciplines participated in this three-phased study. The goal was to develop a team-based model with patient-centered competencies, to enhance responsiveness for patient needs. Each of the three phases in the study targeted a different IPE or CP theme. The study employed a pre-post, self-administered survey that evaluated the participants perceived collaborative practice skill level. The study findings revealed that students' attitudes were significantly more positive after participating in the collaborative experience than the pre-participation responses. Principles of Knowles Adult Learning Theory were integrated by including the participating health professions students into

the planning and evaluation process of the study and applying a problem-based focus for improving patient outcomes.

3. Social Learning Theory

Social Learning Theory, also known as Bandura's Social Learning Theory, or Cognitive Social Learning Theory, is a concept developed by Albert Bandura that connects learning with observation and environmental factors (Bandura, 1977). Bandura felt that individuals learned by observing, and those behaviors were often formed based on their conditioning. This theory's key components are behavior, environment, and person/cognitive, and move through a cyclical process (Figure 4).

Figure 4- Bandura's Social Cognitive Learning Theory



http://jekscience.blogspot.com/2013/03/social-cognitive-theory.html

Social Learning Theory is relevant to IPE and CP as a significant premise for bringing health care providers together to observe other providers' skills, behavior, and attitudes and use this knowledge to learn and improve team-based practice. Simulation activities are an excellent example of observing and modeling behavior based on intrinsic and extrinsic factors (Sinclair & Ferguson, 2009). A study evaluated simulation activities as an IPE and CP tool to explore this phenomenon. Qualitative data assessed the simulation peer activity associated with perceptions of self-preparedness in IPE and CP and overall satisfaction. The study revealed that simulation enhanced collaborative learning and improved perceptions for skill attainment. Positive outcomes for the observational peer activity support Bandura's theory.

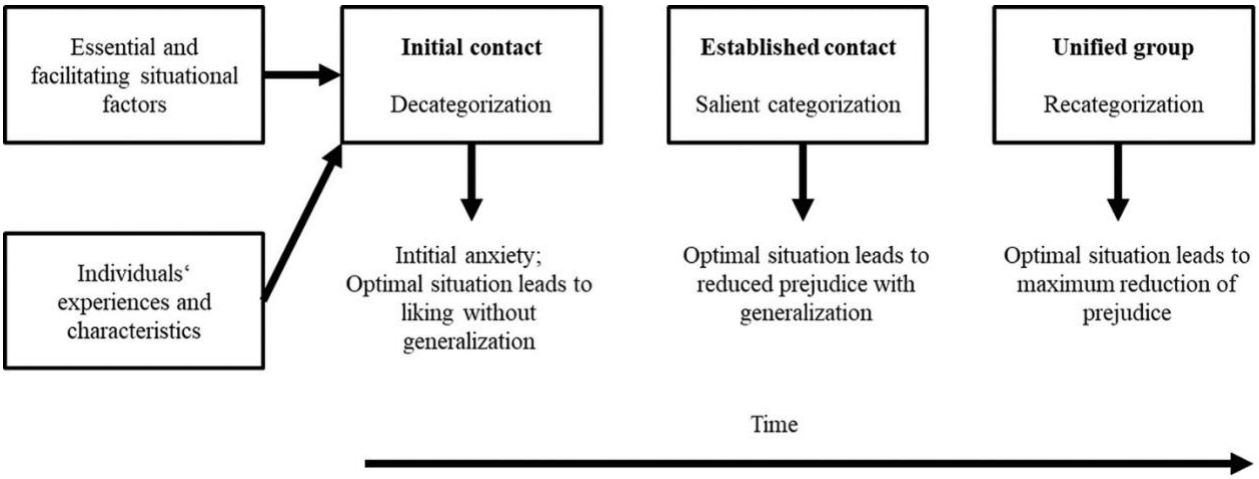
IPE and CP have been heavily researched to understand how skills are enhanced and positive changes are achieved. Likewise, behaviors and attitudes exhibited by providers have been identified as a factor related to patient outcomes. Social Cognitive Theory provides a valuable framework for guiding such research; however, it does not fit with the design for this exploratory study.

4. Contact Theory

As the literature review stated, hierarchies, prejudice, and bias among health care providers are common. Unequal status and dominance factors have also plagued health professions, creating an unwelcoming interprofessional climate. Gordon Allport's Contact Theory was constructed to address these types of problems (Pettigrew, 2006). Contact Theory is intended to remove prejudice through the workings of managed, and controlled, intergroup contact. This concept has practical applications within IPE and CP. The idea is that once [purposeful] contact between health care providers is established, there is a high probability that

it can be sustained and reduce prejudice on a larger scale. Discrimination is often produced by a lack of understanding or knowledge about an individual. Intergroup contact inherently forms through familiarity and bonds individuals by introducing a sense of "membership." These sort of interprofessional alliances can positively impact attitudes and behaviors and have the potential to elicit improvements for patient outcomes. The Contact Learning Theory begins with the initial contact, often accompanied by nervousness and not knowing. After the initial contact, subsequent contact is established and can reduce prejudice, if favorable. The final cycle of contact is defined as achieving a unified group (Figure 5).

Figure 5- Contact Learning Theory



https://link.springer.com/chapter/10.1007/978-3-030-13788-5_10

Pettigrew & Tropp (2006) launched an investigation focusing on intergroup contact theory to learn more about how an encounter between individuals relates to specific contact effects. Using a meta-analysis of 515 studies, they sought to understand the individual concepts for both contact and prejudice. The study provided ample evidence to support Contact Theory.

Using simple exposure (contact) as the dependent variable, they could surmise connections between contact and improved attitudes and acknowledged a reduction in prejudice.

Though the study produced encouraging findings, Contact Theory is a difficult concept to accept. The notion that a simple process, which requires individuals to be in contact, can reduce prejudice can be hard to believe. While Contact Theory holds a respectful level of research [directly associated with interprofessional education], this theoretical framework does not accurately align with the aim of this exploratory study

D. Theoretical/Conceptual Perspective Summary

The use of theory is an essential factor for framing and validating IPE and CP. Many healthcare providers view IPE concepts as anecdotal or opinion-based, yet studies have identified the critical role theory plays in research. Conceptual frameworks use theory to predict what is expected to happen in a particular situation and help construct and direct a process for improvement.

Several different theories directly guide the basis for IPE and CP research. A great deal of evidence supports the thought that environment and experiences play a significant role in learning. The four conceptual frameworks discussed above were selected based on the outlined exploratory study concepts. Using more in-depth inquiry, I was able to recognize that the Social Learning Theory and Contact Theory hold essential points for evaluation, but lack the properties to frame my project as I perceive it. In contrast, the Experiential Learning Theory and Adult Learning Theory effectively addressed my research questions, served as a guide for my study, and helped me understand and interpret the final data. The methods section of this proposal will identify the application of these conceptual frameworks within the study design.

E. Chapter II- Summary

Over the years, an enormous amount of research has been devoted to IPE and CP. Research has produced evidence to suggest that health care professionals require education and appropriate training about IP concepts, essential skills, desired attitudes and expected behaviors to deliver high-level, safe, patient-focused, team-based collaborative care. This study broadly focused on the importance of IPE and CP training in order for clinicians to provide optimal patient care, and suggests that attention needs to move beyond pre-licensure educational programs to identify training needs for practitioners already in the workforce. Healthcare professionals are relied upon for their accomplished level of expertise, and evidence has shown that team-based health care delivery requires learned skills. Therefore, it is crucial to understand their baseline level of competency to expand the scope and educate licensed practitioners on IPE and CP fundamentals. This exploratory study can serve as a guide for curriculum design and training for healthcare professionals in the workforce who are not formally trained in IPE and CP and build a comprehensive, post-licensure, continuing education model that aligns with established IPE and CP training programs for health profession students.

Chapter III. METHODOLOGY

A. Overview

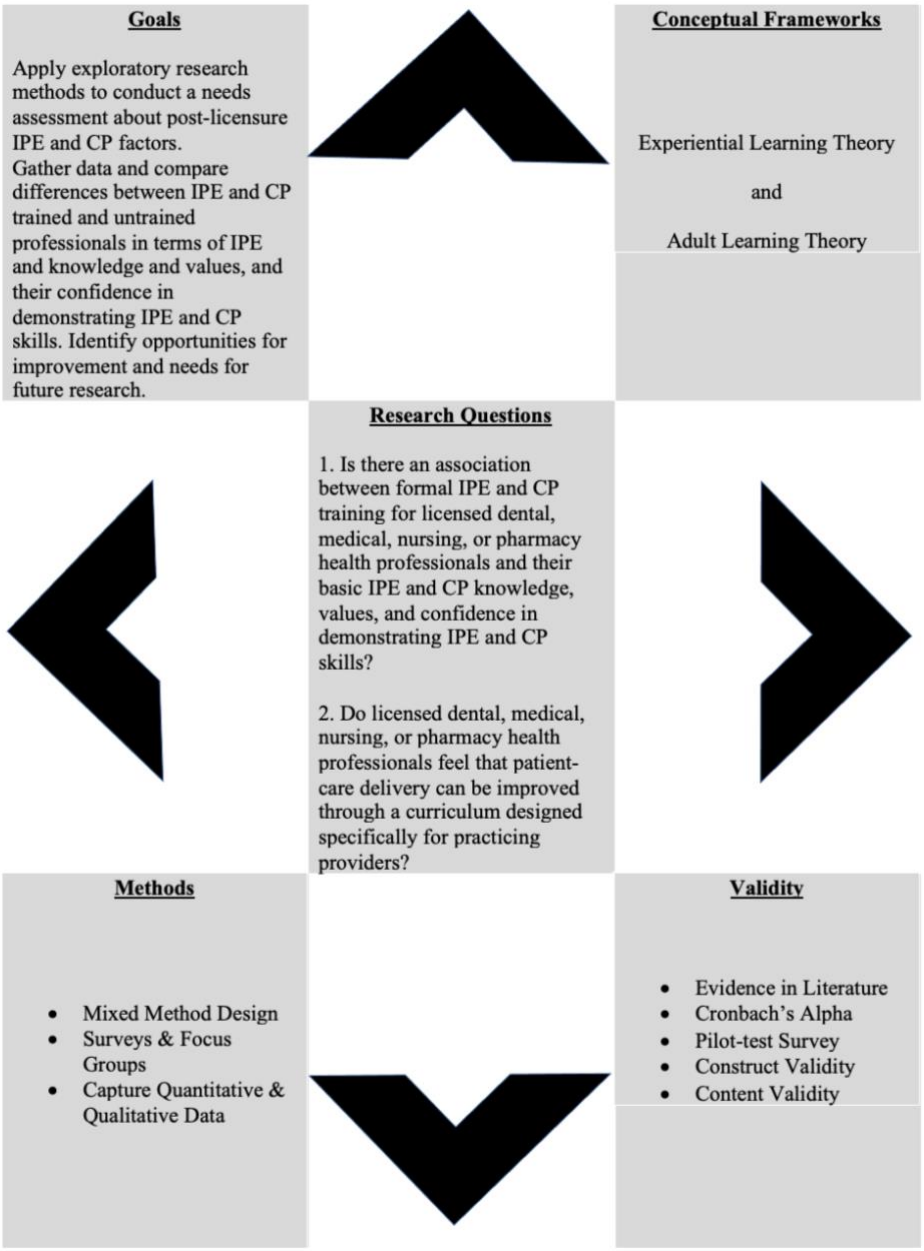
Interprofessional education and collaborative practice in the health care workforce are weak compared to the robust systems currently found in education settings (Anderson & Lennox, 2009). To identify the disconnect and understand why models seem imbalanced, it is important to assess misaligned areas and evaluate potential impacts for patient care. A top-down approach for investigating the problem can effectively utilize current knowledge, as seen throughout interprofessional education literature, along with themes drawn from licensed providers to gain insight and build research and post-licensure curriculum to elicit change. An exploratory inquiry can be a stepping stone in understanding professionals' IPE and CP awareness, identifying attitudinal issues, and assessing readiness for change.

Healthcare, as a system, utilizes a population health methodology to understand a wide-ranging, comprehensive perspective for health care delivery (Wright et al., 1998). The systematic approach for providing care begins with the initial assessment of the patient's needs. Similarly, the education sector employs a parallel [needs assessment] approach to evaluate education methods and identify needs associated with knowledge, skills, attitudes, and interests (McCawley, 2009). A process that integrates assessment strategies adapted from the healthcare industry and validated educational philosophies can produce a blended methodology for enhancing health care delivery.

B. Concept Map

The theoretical frameworks discussed in Chapter II were used as a guide to design this study. This chapter reviews the methodology employed for this research and justifies the philosophical basis for these methods. The concept map provides a basic overview and serves as the blueprint for this study (Figure 6).

Figure 6- Concept Map



C. Research Design

Based on the literature presented in Chapter II, an exploratory study was selected as a logical study design for assessing needs. Since exploratory studies offer open-ended inquiry to retrieve data and understand the implications, their function is ideal for evaluating IPE and CP needs. The purpose of the study was to identify and understand potential differences between health care professionals in the workforce who have received formal IPE and CP training (intervention group), compared to those who have not received formal IPE and CP training (control group), and also to support the development of workforce-based curriculum and continuing education coursework, and encourage future research.

A mixed-method design was utilized to gather both quantitative and qualitative data. Mixed method studies have been credited for effectively producing best practices across health sciences (Creswell, 2012). The Institute for Healthcare Improvement designed a concept model called the *Triple Aim*, which outlined goals for improving health care costs, quality of care delivered, and overall patient satisfaction (IHI, 2022). The *Triple Aim* healthcare optimization program has moved healthcare closer toward meeting intended goals through quantitative and qualitative data synergy. Subsequent development produced the *Quadruple Aim*, which also accounts for the well-being of the healthcare team member (Bodenheimer & Sinsky, 2014).

Using a quantitative lens, surveys gathered demographic and descriptive data, in addition to data focusing on IPE and CP knowledge, confidence, and values. Next, focus groups followed a qualitative approach to collect additional viewpoints from practitioners and identify drivers for workforce training and continuing education. The integration of these methods offered a complimentary and robust perspective to address the research questions.

D. Research Questions

1. Is there an association between formal IPE and CP training among dental, medical, nursing, or pharmacy health professionals in the workforce, and their basic IPE and CP knowledge, values, and confidence in demonstrating IPE and CP skills?

   $H1_0$ There is no association between formal IPE and CP training among dental, medical, nursing, or pharmacy health professionals in the workforce, and their basic IPE and CP knowledge.

   H1 There is an association between formal IPE and CP training among dental, medical, nursing, or pharmacy health professionals in the workforce, and their basic IPE and CP knowledge.

   $H2_0$ There is no association between formal IPE and CP training among dental, medical, nursing, or pharmacy health professionals in the workforce, and their value for IPE and CP.

   H2 There is an association between formal IPE and CP training among dental, medical, nursing, or pharmacy health professionals in the workforce, and their value for IPE and CP.

   $H3_0$ There is no association between formal IPE and CP training among dental, medical, nursing, or pharmacy health professionals in the workforce, and their confidence in demonstrating IPE and CP skills

   H3 There is an association between formal IPE and CP training among dental, medical, nursing, or pharmacy health professionals in the workforce, and their confidence in demonstrating IPE and CP skills

2. Do dental, medical, nursing, or pharmacy health professionals in the workforce feel that patient-care delivery can be improved through a curriculum designed specifically for practicing clinicians?

   $H1_0$ Dental, medical, nursing, or pharmacy health professionals in the workforce do not believe that patient-care delivery can be improved through a curriculum designed specifically for practicing clinicians

   H1 Dental, medical, nursing, or pharmacy health professionals in the workforce believe that patient-care delivery can be improved through a curriculum designed specifically for practicing clinicians

   $H2_0$ Dental, medical, nursing, or pharmacy health professionals in the workforce do not feel comfortable using various learning platforms

   H2 Dental, medical, nursing, or pharmacy health professionals in the workforce feel comfortable using various learning platforms

   $H3_0$ Dental, medical, nursing, or pharmacy health professionals in the workforce are not willing to complete post-licensure IPE and CP training

   H3 Dental, medical, nursing, or pharmacy health professionals in the workforce are willing to complete post-licensure IPE and CP training

   $H4_0$ Dental, medical, nursing, or pharmacy health professionals in the workforce do not feel that continuing education in IPE & CP should be required for re-licensure.

   H4 Dental, medical, nursing, or pharmacy health professionals in the workforce feel that continuing education in IPE & CP should be required for re-licensure

E. Research Permission and Ethical Consideration

The University of Illinois at Chicago Institutional Review Board reviewed the application for research and granted exemption under protocol # 2021-0724. There are no ethical considerations involved in this study (see Appendix B.).

F. Target Population and Sample

1. Sample- Survey Participants

Four healthcare professions [dentistry, medicine, nursing, and pharmacy] were identified [through the research for participation in the study based on the largest body of IPE and CP literature and research available. Recruitment, targeting a purposive convenience sample, was accomplished via emails and text messaging, social media platforms, and word of mouth. The deliberate selection guaranteed that subjects embodied the necessary characteristics for inclusion and allowed for greater generalizability of the data. Subjects who had undergone formal training in IPE and CP were recruited and represented the intervention group. Additionally, subjects who had not undergone formal training in IPE and CP were recruited and represented the control group. This recruitment allowed for comparability between groups. Participation was incentivized, as all subjects were eligible to enter a raffle for a chance to win a $100 Amazon gift card. The inclusion criteria included health care professionals licensed in dentistry, medicine, nursing, and pharmacy.

The RIPLS pilot study, which surveyed 120 health professions students from seven different professions to assess IPE perceptions, formed the basis for selecting the sample size for the study (Parsell & Bligh, 1999). With similarities between the RIPLS study and this exploratory study, the sample size was set to meet a minimum threshold of 20 subjects per group, with a minimum of 160 subjects. Robust recruitment gave rise to the enrollment of 397 subjects.

Of those 397 subjects, 42 subjects were disqualified due to incomplete survey fields, resulting in 355 research subjects. Representation was highest among healthcare professionals from dentistry and pharmacy; however, minimum thresholds for all groups were satisfied in excess. (Table III).

Table III- Survey: Sample by Profession

Subjects	Formal IPE or CP Training	No Formal IPE or CP Training	Total
Dentistry	N=77	N=26	N=103
Medicine	N=54	N=29	N=83
Nursing	N=31	N=32	N=63
Pharmacy	N=64	N=42	N=106
			Total sample: N=355

2. Sample- Focus Group Participants

Focus groups recruitment was achieved by inviting subjects who participated in the survey portion of the study to participate in a follow-up 45-minute focus group. Participation was incentivized, offering participants an opportunity to enter an additional raffle for a chance to win a $100 Amazon gift card. Since there was greater interest than need, a stratified sample was randomized, and the appropriate number of subjects for each group was selected. This method helped achieve balance among focus groups in size and baseline covariates.

While the focus group discussions were rooted in interprofessionalism and team-based care theories, the focus group compositions were strictly uni-professional. Purposive, same-profession assignments were exercised to minimize known barriers for communication and collaboration, allow for robust discussions, and diminish skewing of data. Braithwaite et al. (2016) researched multi-profession, group dynamics and found that stereotypical behaviors resonated among clinicians. In an experimental study, clinical professionals were assigned an interprofessional team task and were observed. Instinctively, profession-based tribes formed, and

an unspoken hierarchy reduced some team members to take a subordinate role. Since these barriers commonly emerge among healthcare teams, the focus group composition was given significant consideration. Using same-discipline focus groups created an atmosphere of shared familiarity and limited intimidation, eliciting open conversations. Focus groups were comprised of four subjects [from the same health profession] who had formal IPE and CP training and four who had no formal training (Table IV). Groups were not controlled for demographic factors or characteristics. Chapter IV expands upon the specific demographic data.

Table IV- Focus Group: Sample by Profession

Subjects	**Formal IPE or CP Training**	**No Formal IPE or CP Training**
Dentistry	N=4	N=4
Medicine	N=4	N=4
Nursing	N=4	N=4
Pharmacy	N=4	N=4
		Total sample: N=32

G. Setting

Due to the COVID-19 global pandemic, this entire study was conducted remotely using an electronic survey platform (*Qualtrics XM*) and a virtual meeting platform (*Zoom*©). Surveys were actively available for 30 days. In addition, focus groups were scheduled on varying days/times based on the group members' availability. While initial concerns emerged with the inability to host in-person focus groups, the remote nature served beneficial for meeting with individuals from various regions in the United States.

H. Procedure, Materials, and Instruments

The study was sequenced into two phases for capturing data. Phase one was dedicated to capturing survey data, and phase two was established for focus group data collection. The inclusion criteria for phases one and two were identical, allowing for all recruitment to occur at the start of the project. A recruitment flyer was created to describe the study's aim, provide participation details, and highlight the raffle incentive. A copy of the recruitment flyer can be found in Appendix C. Recruitment flyers were emailed to healthcare professionals across the United States using a generated list of public email addresses and professional organizations and associations for dentistry, medicine, nursing, and pharmacy. Additionally, social media was utilized to cross-post the flyers for recruitment. [MH comment – since the participants were from so many different locations, given the small sample, does that pose a methodological issue?]

Participants completed the research survey during the first phase to establish a structured approach for the study. Next, the researcher reviewed the survey data for completeness and filtered the data to identify participants who indicated an interest in being considered for focus group participation in phase two. Finally, interested candidates for phase two were stratified, randomized, and selected for assigned focus groups. Details for each phase are outlined below.

1. Survey Overview

Survey participants in the study were provided with a *Qualtrics XM* link to begin the survey. Upon entering the survey, the participants were instructed to read the *Informed Consent.* After consenting, a prompt to "continue" launched the survey. A copy of informed consent can be found in Appendix D. Upon completion of the survey, subjects were offered an opportunity to enter an optional prize drawing. They were informed that opting into the drawing required

disclosing their name and contact information. Next, subjects were notified about the prospect of participating in a follow-up focus group and their eligibility for entering an additional raffle drawing for a chance to win a $100 Amazon gift card. Subjects responded by either accepting or declining focus group consideration. Finally, a debrief form populated to provide final comments and instructions. The debrief form can be found in Appendix E.

2. Survey Instrument

The survey functioned as the instrument used for collecting, measuring, and comparing data. The survey instrument employed a compilation of validated tools to represent a single survey. The decision to unite the tools was based on ease of distribution and straightforwardness. The design allowed for a unified method to simultaneously capture and assess data. Questions exhibited structural variations, which enhanced methods for capturing comprehensive data. The survey structure is outlined below. The complete survey can be found in Appendix F.

a. Survey Structure

Demographic Data

Comprised of 11-questions to gather demographic and descriptive data [gender, age, race/ethnicity, subject's health profession, subject's specialty training, subjects IPE or CP training, and training location].

Section I

Comprised of an 8-question survey, modified from the IPECC-SET, to measure confidence in demonstrating IPE and CP skills. A 5-point Likert-type scale identifies the subject's confidence level, signifying the lowest confidence level as one and the highest level of confidence as five.

Section II

Comprised of an 8-question IPE and CP knowledge assessment. The multiple-choice questions were selected from the UCLA Medicine *IP Knowledge Question Bank*. Answers were scored for correctness to assess basic IPE and CP knowledge. The answer key can be found in Appendix G.

Section III:

Comprised of 10-questions to measure values for IPE and CP. The questions were developed by the IPEC Expert Panel and used a 5-point Likert-type scale to asses value.

3. Validity

Validity is essential to ensure the accuracy of intended research measures and uphold the reliability of the research data. The NEXUS *Measurement Tool Guide,* which identifies various factors to consider for validity, was used as the framework for this study (Schmitz & Cullen, 2015). The following processes were deployed to test validity. Chapter IV expands upon the validity data and analysis.

a. Content validity, construct validity, and response process

Supporting literature helped inform processes to corroborate validity for this project. The survey instrument used in the study was created by combining portions of previously validated instruments to form a single survey. Before launching the survey, a pilot survey was deployed to confirm the clarity of questions and identify the average length of time needed for completion. Four health professionals were recruited to test the instrument (dentistry [n=1], medicine [n=1], nursing [n=1], and pharmacy [n=1]). The four pilot testers were disqualified from participating in the actual study.

b. Internal validity

Using Cronbach's alpha test, scaled survey questions were tested for internal consistency and intercorrelations.

c. Triangulation

The overall design of this study offered multiple data sources, which promoted contextual interpretation and ease for triangulation. Surveys used varying questions and structures to capture scaled perceptions and absolute responses. Focus groups provided open-ended discussions and created a space for observation and interpretation.

4. Focus Group Overview

Participants from the survey were invited to participate in a 45- minute follow-up focus group via Zoom©. Focus groups were conducted with each of the four health professions to identify licensed health professionals' feelings about continuing education for IPE and CP. Each focus group included four participants holding formal IPE and/or CP training and four who had no previous formal IPE and/or CP training. There was a total of 32 overall participants. The sample size was chosen based on a comparative study in the GMS Journal of Medical Education (Schwarzbeck et al., 2019).

a. Focus Group Format

Once focus group participants were identified, they were provided with instructions and a Zoom© meeting link for the session. At the start of each session, the researcher reminded the group about the purpose of the study, reaffirmed consent for participation, and obtained permission to capture an audio/video recording of the session. The bullet points below provide an outline of the focus group workflow. The complete focus group script can be found in Appendix G.

- Welcome
- Introductions
- Focus group prompts and questions
    - Central question 1 Focus-previous experience
    - Central question 2 Focus -practical or applied experience
    - Central question 3 Focus -direct needs
    - Central question 4 Focus-continuing education
    - Central question 5 Focus-intersection
    - Central question 6 Open for group questions or final comments

I. Data Collection and Analysis

Data collection methods were achieved using *Qualtrics XM* for surveys and recorded *Zoom©* sessions for focus groups. A quantitative analysis was conducted, using *IBM® SPSS® Version 28*, to evaluate survey data. For the qualitative analysis, data from recorded *Zoom©* sessions were auto-transcribed through *Zoom©*, cleaned, coded, and thematically analyzed for interpretation using *Microsoft Excel for Mac* and *Microsoft Word for Mac.*

1. Quantitative Data

Quantitative analysis was used to evaluate the validity of the survey instrument, describe participants in the study, and assess their survey responses related to IPE and CP. Survey questions were separated into three distinct categories. In Section I., respondents indicated their perceived confidence level in demonstrating IPE and CP skills based on a 5-point Likert scale. In Section II., respondents answered multiple-choice questions about IPE and CP, and their IPE and CP knowledge-base was established by evaluating the number of correct answers. Section III. of the survey assessed the value that respondents held for IPE and CP by asking whether they

agreed or disagreed with various IPE and CP-related statements. The value-based responses were also recorded using a 5-point Likert scale. While Section II scored for absolute correctness to establish knowledge, Sections I and III used a scaled approach for interpretation. Cronbach's alpha examined the internal validity for scaled questions to establish reliability and consistency.

Descriptive Data

It was important to confirm that the study exhibited a representative sample to generalize the data. Descriptive statistics examined the subjects' characteristics and provided calculations and percentages for demographical representation. In terms of characteristics, the survey captured participants:

- Gender
- Race/ethnicity
- Age
- Health profession
- Specialty training (if applicable)
- Location of training
- Absence of presence of IPE and CP training (before or after licensure)
- The rigor of IPE and CP training (if applicable)

Measures for central tendency also helped define the distribution of the sample. Independent samples t-test was performed to assess statistical differences between the intervention and control groups. The overall intent of the data analysis was to extract relevant and reliable information aimed at answering the hypothesis.

2. Qualitative Data

Before beginning qualitative data collection, it was necessary to consider data reductions strategies (Hays, 2012). By outlining the script, and the six centrally focused questions, the data captured during focus groups was reduced to responses aimed at answering the research

question. The focus group was recorded and auto-transcribed in *Zoom©*. Observation notes were also taken during each session. Discourse analysis and conversation analysis were applied to transcripts and observations to analyze sociolinguistic exchanges (Razfar, 2014). The study's theoretical framework, research questions, and focus group questions/prompts served as the basis for coding the transcribed data and relevant content that emerged during the discussions. To begin coding, transcriptions were copied into a document in *Microsoft® Word for Mac, Version 16.57*. The script was placed in a 2x2 table, with the transcription in the left column. The transcription was then reviewed, line by line, to extract words, phrases, or content that held relevancy to the research question and focus group prompts, in addition to other relevant or repetitive content that transpired during the discussion. These words and phrases were coded in the right column. Next, codes were reviewed, re-evaluated for relevancy, cleaned, and grouped under (applicable) categories. Finally, codes were reviewed for patterns and themes. Columns were labeled by theme in a separate table (using *Microsoft® Excel for Mac, Version 16.57)*. The applicable codes were pasted in the column and summed to calculate frequency and thematic analysis. A thematic analysis methodology has proven effective in understanding viewpoints from different subjects, exploring their similarities and dissimilarities, organizing mutuality, and summarizing assumptions. (Nowell et al., 2017). Chapter IV provides a visual depiction of the coding process.

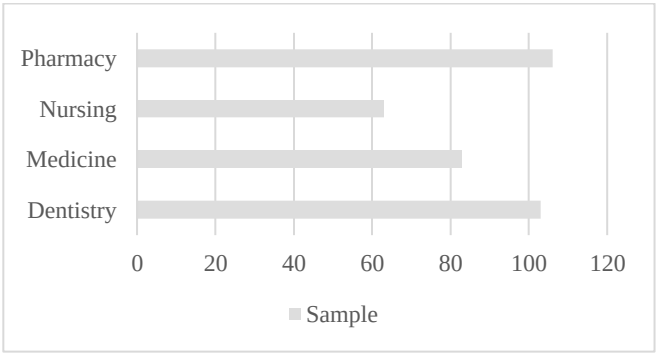
Chapter IV. RESULTS

To align with the specific objectives for the study, the results were intended to identify the absence or presence (including rigor) of formal IPE or CP training, assess basic IPE and CP knowledge and values, and evaluate participants' perceived confidence in demonstrating IPE and CP skills. Additionally, the study aimed to assess participants' level of interest in engaging in IPE and CP training. Finally, subjects were asked to share preferred methods for participating in continuing education and were probed for feedback about the idea for instating mandatory IPE and CP requirements for licensure and renewals. Results from both quantitative and qualitative data informed the analysis and subsequent conclusions.

A. Quantitative Data

Descriptive statistics were obtained to assess the sample representation for survey participants (n = 355). Findings showed that approximately 29% of the sample represented dentistry, 23% medicine, 18% nursing, and 30% represented pharmacy. (Figure 7). In addition to their health profession, varying healthcare specialties and subspecialties existed within each discipline; therefore, survey participants were also asked to indicate their specialty domain, when applicable. For example, dentists with a specialty in orthodontics and physicians specializing in pediatrics carried the highest representation.

Figure 7- Survey: Sample by Profession (n = 355)



To understand and document the potential influence that IPE and CP training had on health care practitioners, subjects were asked whether or not they had received formal training in IPE and CP while completing their health professions programs. Participants who responded "yes" were also asked to indicate their rigor of training to avoid misinterpretation or generalization of the survey's definition for "formal training." Indicating "rigor" confirmed that the participants' experience met the minimal qualification of "formal training." A list of IPE and CP experiences, which qualified as "formal training," was provided. Though statistical evaluation for this study did not compare rigor/experiences to assess associations, future appraisals might use the data to weigh rigor and potential implications.

In terms of training, 196 (55%) reported training. For rigor, 62% of participants testified that IPE and CP concepts were embedded into their curriculum (Table V). Subjects who reported receiving training were also given the option to indicate the location for their training. Training locations were conveyed by 223 subjects and spanned across 29 different states. Although most subjects were trained within educational institutions, healthcare settings (i.e., hospitals and medical centers), conference workshops, and continuing education courses were also specified as a training source. Data showed that the University of Illinois at Chicago and Rosalind Franklin University of Medicine and Science trained the highest number of participants in this study. Like rigor, the setting or location for training was captured for informational purposes [and potential future research] but was not statistically evaluated in this study (Table V).

Table V- IPE and/or CP Training During Program

Did you learn about IPE and/or CP in your training program?		
Answer	%	Count
Yes, I learned about IPE/CP in my training program	55.21%	196
No, I did not learn about IPE/CP in my training program	43.66%	155
Other	1.13%	4
Total	100%	355
Rigor of training		

IPE/CP concepts and experiences were embedded in the curriculum of my program	62.16%	161
I participated on an IPE/CP workshop	26.64%	69
I attended an IPE/CP bootcamp	6.18%	16
Other	5.02%	13
Total	100%	259

In addition to assessing experiences with institutional IPE and CP training, subjects were also asked if they received formal training after joining the workforce. Again, to avoid oversimplifying the definition for training, participants were asked to specify the rigor of their work. This time, only 33% of participants indicated that they had undergone formal training, with most rigor pointing to CE courses and workshops. (Table VI)

Table VI- IPE and/or CP Training After Program

Did you learn about IPE and/or CP AFTER your training program?		
Answer	%	Count
Yes, I learned about IPE/CP AFTER my training program	32.68%	116
No, I did not learn about IPE/CP AFTER my training program	61.69%	219
Other	5.63%	20
Total	100%	355
Rigor of training		
I completed and IPE/CP certificate or degree program	4.62%	18
I attended an IPE/CP CE course	14.62%	57
I participated in an IPE/CP workshop	16.15%	63
I attended an IPE/CP bootcamp	3.08%	12
Other	3.59%	14
N/A	57.95%	226
Total	100%	390

1. Subjects Characteristics

Demographic data was also gathered to support the representation and generalizability of the survey sample. For gender, 237 subjects (67%) identified as being female, 117 male (33%),

and 1 subject (.28%) chose not to answer (Figure 8). For race/ ethnicity, 16 subjects (5%) reported being Hispanic or Latino, 63 (18%) Asian or Pacific Islander, 19 (5%) Black or African American, 246 (69%) White, 7 (2%) more than one ethnic group, and 4 subjects (1%) chose not to answer (Figure 8). Lastly, in terms of age group (by years), 13 subjects (4%) were between 22-25 years of age, 38 subjects (11%) were between 26-29, 74 subjects (21%) were between 30-35, 43 subjects (12%) were between 36-40, 47 subjects (13%) were between 41-45, 40 subjects (11%) were between 46-50, and 100 subjects (28%) were age 51 or older.

2. Survey Pilot Test

Before launching the actual survey, a pilot test group (with one health professional from each of the four study disciplines) completed a mock survey to test for clarity and ensure validity. Qualtrics computed the average time to complete the survey to be 13-minutes. Based on feedback from the pilot-test group, no changes were applied to the study proposed. Additionally, using Cronbach's alpha, statistical testing was employed to assess the internal validity for the survey's scaled questions. The scaled survey questions showed high reliability based on Cronbach's alpha score of .812 for *confidence* and .749 for *values*.

3. Survey Data

a. Confidence

An independent samples t-test was conducted to evaluate whether IPE and CP trained healthcare professionals (intervention group) were more confident demonstrating IPE and CP skills when compared to untrained healthcare professionals (control group). The results indicated that the mean confidence for trained healthcare professionals *(M= 4.28, SD=.551)* was significantly greater than the mean confidence for untrained healthcare professionals *(M= 4.03, SD= .647), t(3.85) = (353), p <001.* The standardized effect size *d* was *.415* with a 95%

confidence interval of *.190 to 6.12.* The 95% confidence interval for the mean difference between the two groups was *.122 to .372*. Overall, results suggest a significant increase in confidence demonstrating IPE and CP skills among healthcare professionals who received training (VII)..

Table VII- Independent Samples T-Test- Confidence- Group Statistics

Independent Samples T-test – Confidence – Group Statistics									
Training		N		Mean		Std Dev		Std. Error Mean	
Yes		196		4.2851		.55192		.03942	
No		159		4.0377		.64735		.05134	
Equality of Variance and Equality of Means									
F	Sig	t	df	One-sided	Two-sided	Mean Difference	Std Error Difference	95% Confidence Lower	95% Confidence Upper
1.481	.224	3.885	353	<.001	<.001	.24734	.06367	.12213	.37255
Cohen's d									
Standardizer				Point Estimate			95% Confidence Interval Lower		95% Confidence Interval Upper
.41552				.401			.190		.612

In addition, the same testing parameters were applied each to individual health profession to evaluate for uni-professional differences in confidence demonstrating IPE and CP skills. The results indicated:

i. <u>*Dentistry*</u>

The mean confidence for IPE and CP trained dental professionals *(M= 4.16, SD=.630)* was greater than the mean confidence for untrained dental professionals *(M= 3.82, SD= .668), t(2.62) = (101), p .010.* The standardized effect size *d* was *.651* with a 95% confidence interval of *.124 to .913.* The 95% confidence interval for the mean difference between the two groups was *.082 to .594*. Overall, results failed to suggest a significant increase in confidence demonstrating IPE and CP skills for dental professionals who received IPE and CP training.

ii. *Medicine*

The mean confidence for IPE and CP trained medical professionals *(M= 4.27, SD=.549)* was greater than the mean confidence for untrained medical professionals *(M= 4.21, SD= .650), t(.461) = (81), p .646.* The standardized effect size *d* was *.586* with a 95% confidence interval of -.346 *to .557.* The 95% confidence interval for the mean difference between the two groups was -.206 *to .330*. Overall, results failed to suggest a significant increase in confidence demonstrating IPE and CP skills for medical professionals who received IPE and CP training.

iii. *Nursing*

The mean confidence for IPE and CP trained nursing professionals *(M= 4.38, SD=.434)* was greater than the mean confidence for untrained nursing professionals *(M= 4.21, SD= .591), t(1.31) = (61), p .194.* The standardized effect size *d* was *.520* with a 95% confidence interval of -.168 *to .827.* The 95% confidence interval for the mean difference between the two groups was -.089 *to .434*. Overall, results failed to suggest a significant increase in confidence demonstrating IPE and CP skills for nursing professionals who received IPE and CP training.

iv. *Pharmacy*

The mean confidence for IPE and CP trained pharmacy professionals *(M= 4.33, SD=.538)* was greater than the mean confidence for untrained pharmacy professionals *(M= 4.06, SD= .593), t(2.39) = (104), p .018.* The standardized effect size *d* was *.560* with a 95% confidence interval of .080 *to .869.* The 95% confidence interval for the mean difference between the two groups was .045 *to .487*. Overall, results failed to suggest a significant increase in confidence demonstrating IPE and CP skills for pharmacy professionals who received IPE and CP training.

b. Knowledge

An independent samples t-test was also conducted to evaluate whether IPE and CP trained healthcare professionals (intervention group) held greater IPE and CP knowledge when compared to untrained healthcare professionals (control group). The results indicated that the mean confidence for trained healthcare professionals *(M= .730, SD=.193)* was significantly greater than the mean confidence for untrained healthcare professionals *(M= .562, SD= .258), t(6.73) = (353), p <001.* The standardized effect size *d* was *.225* with a 95% confidence interval of *.502 to .934.* The 95% confidence interval for the mean difference between the two groups was *.114 to .208*. Overall, results suggest a significant increase in IPE and CP knowledge for healthcare professionals who received training (Table VIII).

Table VIII- Independent Samples T-Test- Knowledge- Group Statistics

Independent Samples T-test – Knowledge – Group Statistics					
Training	N	Mean	Std Dev	Std. Error Mean	
Yes	196	.7309	.19394	.01385	
No	159	5692	.25842	.02049	

Equality of Variance and Equality of Means									
F	Sig	t	df	One-sided	Two-sided	Mean Difference	Std Error Difference	95% Confidence Lower	95% Confidence Upper
17.350	<.001	6.730	353	<.001	<.001	.16168	.02402	.11444	.20893

Cohen's d			
Standardizer	Point Estimate	95% Confidence Interval Lower	95% Confidence Interval Upper
.22510	.718	.502	.934

Once again, the same testing parameters were applied to each health profession to evaluate uni-professional differences in IPE and CP knowledge between trained and untrained professionals. The results indicated:

i. *Dentistry*

The mean knowledge for IPE and CP trained dental professionals *(M= .678, SD=.209)* was greater than the mean knowledge for untrained dental professionals *(M= 520, SD= .239), t(3.53) = (101), p <.001.* The standardized effect size *d* was *.226* with a 95% confidence interval of *.298 to 1.096.* The 95% confidence interval for the mean difference between the two groups was *.069 to .246*. Overall, results suggest a significant increase in IPE and CP knowledge among dental professionals who received IPE and CP training.

ii. *Medicine*

The mean knowledge for IPE and CP trained medical professionals *(M= .782, SD=.188)* was greater than the mean knowledge for untrained medical professionals *(M= .594, SD= .230), t(3.99) = (81), p <.001.* The standardized effect size *d* was *.203* with a 95% confidence interval of *.444 to 1.39.* The 95% confidence interval for the mean difference between the two groups was *.094 to .281*. Overall, results suggest a significant increase in IPE and CP knowledge among medical professionals who received IPE and CP training.

iii. *Nursing*

The mean knowledge for IPE and CP trained nursing professionals *(M= .673, SD=.200)* was greater than the mean knowledge for untrained nursing professionals *(M= .660, SD= .213), t(.252) = (61), p .801.* The standardized effect size *d* was *.207* with a 95% confidence interval of -*.431 to .9558.* The 95% confidence interval for the mean difference between the two groups was *.091 to .117*. Overall, results fail to suggest a significant increase in IPE and CP knowledge among nursing professionals who received IPE and CP training.

iv. *Pharmacy*

The mean knowledge for IPE and CP trained pharmacy professionals *(M= .753, SD=.169)* was greater than the mean knowledge for untrained pharmacy professionals *(M= .547, SD= .048), t(4.37) = (104), p<.001.* The standardized effect size *d* was *.237* with a 95% confidence interval of *.460 to 1.27.* The 95% confidence interval for the mean difference between the two groups was *.112 to .299*. Overall, results suggest a significant increase in IPE and CP knowledge among pharmacy professionals who received IPE and CP training.

c. ***Values***

An independent samples t-test was conducted to evaluate whether IPE and CP trained healthcare professionals (intervention group) possessed higher values for IPE and CP when compared to untrained healthcare professionals (control group). The results indicated that the mean confidence for trained healthcare professionals *(M= 3.76, SD=.390)* was significantly greater than the mean confidence for untrained healthcare professionals *(M= 3.59, SD= .444), t(3.76) = (353), p <001.* The standardized effect size *d* was *.415* with a 95% confidence interval of *.190 to 6.12.* The 95% confidence interval for the mean difference between the two groups was *.079 to .254*. Overall, results suggest a significant increase in values for IPE and CP among healthcare professionals who received training (Table IX).

Table IX- Independent Samples T-Test- Values- Group Statistics

Independent Samples T-test – Values – Group Statistics									
Training	N	Mean	Std Dev	Std. Error Mean					
Yes	196	3.7643	.39020	.02787					
No	159	3.5975	.44479	.03527					
Equality of Variance and Equality of Means									
F	Sig	t	df	One-sided	Two-sided	Mean Difference	Std Error Difference	95% Confidence Lower	95% Confidence Upper
1.258	.263	3.761	353	<.001	<.001	.16680	.04435	.07958	.25402
Cohen's d									

Standardizer	Point Estimate	95% Confidence Interval Lower	95% Confidence Interval Upper
.41552	.401	.190	.612

In addition, the same testing parameters were applied to each health profession to evaluate for uni-professional differences in IPE and CP values between trained and untrained professionals. The results indicated:

i. *Dentistry*

The mean values for IPE and CP trained dental professionals *(M= 3.39, SD=.431)* was greater than the mean values for untrained dental professionals *(M= 3.56, SD= .455), t(1.43) = (101), p .155.* The standardized effect size *d* was *.444* with a 95% confidence interval of -.107 *to .673.* The 95% confidence interval for the mean difference between the two groups was *.048 to .300*. Overall, results failed to suggest a significant increase in IPE and CP values among dental professionals who received IPE and CP training.

ii. *Medicine*

The mean values for IPE and CP trained medical professionals *(M= 3.75, SD=.425)* was greater than the mean values for untrained medical professionals *(M= 3.48, SD= .389), t(2.89) = (81), p .006.* The standardized effect size *d* was *.413* with a 95% confidence interval of *.192 to 1.116.* The 95% confidence interval for the mean difference between the two groups was *.081 to .460*. Overall, results failed to suggest a significant increase in IPE and CP values among medical professionals who received IPE and CP training.

iii. *Nursing*

The mean values for IPE and CP trained nursing professionals *(M= 3.86, SD=.355)* was greater than the mean values for untrained nursing professionals *(M= 3.80, SD= .444), t(.608) =*

(61), p .546. The standardized effect size *d* was *.400* with a 95% confidence interval of -*.342 to .647.* The 95% confidence interval for the mean difference between the two groups was *.140 to .263*. Overall, results failed to suggest a significant increase in IPE and CP values among nursing professionals who received IPE and CP training.

iv. Pharmacy

The mean values for IPE and CP trained pharmacy professionals *(M= 3.77, SD=.338)* was greater than the mean values for untrained pharmacy professionals *(M= 3.55, SD= .434), t(2.88) = (104), p .005.* The standardized effect size *d* was *.379* with a 95% confidence interval of *.174 to .968.* The 95% confidence interval for the mean difference between the two groups was *.067 to .366*. Overall, results failed to suggest a significant increase in IPE and CP values among pharmacy professionals who received IPE and CP training.

4. Focus Group Data

The first step for analyzing the focus group data was to describe the participants. Focus groups were designed to appoint an equal number of IPE or CP trained and untrained subjects from the same profession to each group. Variations between subjects' backgrounds, work settings, and experience also contributed to productive discussions and offered considerable data. Like the surveys sample, the focus group subjects represented a range of characteristics (Table X)

Table X- Demographics- Focus Group Sample

Subjects Profession	**Dentistry**	**Medicine**	**Nursing**	**Pharmacy**
Gender	5 Females 3 Males	2 Females 6 Males	8 Females	6 Females 2 Males
Race/ Ethnicity	2 Asian/PI 2 Black/AA 4 White	1 Hispanic/Latino 2 Asian/PI 5 White	1 Hispanic/Latino 1 Asian/PI 1 Black/AA 5 White	1 Hispanic/Latino 7 White
Age	1 - 26-29	1 - 30-35	1- 26-29	2 - 22-25

	1 - 30-35 1 - 36-40 1 - 41-45 2 - 46-50 2 - 51>	1 - 36-40 1 - 41-45 2 - 46-50 3 - 51>	1- 30-35 1- 36-40 2 41-45 1- 46-50 2 - 51>	2 - 26-29 2 - 30-35 1- 41-45 1- 46-50

B. Qualitative Data

Focus groups were employed to provide an overlapping analysis, allow the researcher to conceptualize findings, and offer greater confidence in concluding. The focus groups were designed to use a semi-structured approach, with open-ended questions, aimed at eliciting feedback related to the following topics:

- IPE and CP experience
- Individual application of interprofessional and collaborative concepts in the workplace
- Interest in learning more about IPE and CP
- Preferred platform for future IPE and CP learning
- Thoughts about IPE and CP CE as a requirement for license renewal for all healthcare professionals

Each focus group session began by having participants introduce themselves, state how long they have been in practice, and describe their practice setting. Group representations were diverse in demographics, educational and clinical backgrounds, and years in the practice. Table VII. (above) provided a snapshot of the demographical data. Qualitative data were extracted from focus groups and are outlined by profession (below).

1. <u>Dental Professionals Focus Group</u>

The dental focus group included dentists with between 2-45 years' experience, holding backgrounds in educational settings, private practice settings, community/public health settings, administration, and research. Five central questions were posed during the discussion. The first questions/prompts asked participants to discuss their previous IPE and CP training. The four

dental professionals who had formal training all indicated that IPE was embedded into the curriculum of their programs, but only one recalled participating in a collaborative experience.

The second set of questions/prompts looked at practical or applied experience. Participants were asked to think about a time when they either applied IPE and CP concepts in the workplace and recognized a positive outcome or a time that they failed to apply concepts and recognized potential impacts by the gap in communication. Some powerful comments were:

> *"I remember a time when I forgot to review a patient's EHR, and at the end of the appointment, the patient casually mentioned that he'd had a heart attack a few weeks ago. I panicked because elective treatment should have been deferred for 6-months. Luckily it turned out fine".*

> *"I had this patient who had this rare syndrome. I vaguely remember learning about it, but I was too embarrassed [that I was unfamiliar], so instead of calling the physician to check for potential concerns, I looked it up to get the answer".*

> *"I studied dental sleep medicine, and I feel like that was a time when I got to engage in the physician/dentist relationship. We taught each other a lot".*

The third set of questions/prompts probed participants to reflect on their experience and identify their direct needs in terms of IPE and CP. Once again, explanations were rooted in multilayered introspection. Some examples are:

> *"For me, it would be helpful if I had a well-defined workflow for clearing patients who need a pre-authorization for surgery. I don't know if there's something I should be reporting outside absence of active disease".*

> *"I feel like I had some good exposure to interprofessional concepts in dental school, but I still feel like we are seen as someone different. Like, medical students didn't even know what we did, and I wonder how we can advocate for dentists to be recognized as team members or colleagues in the field".*

> *"I'd like to have a more conventional relationship with physicians…to even like bounce questions back and forth…I mean, I have patients with a multitude of health problems… I feel like if I had a medication question, what do I do? Do I call CVS and sit on hold for God know how long…and talk to a random pharmacist or tech? I know that it's my responsibility [as my patient's provider] to forge relationships, but I'm not sure about the best way to do it while trying to provide timely care for my patients".*

> *"I agree. I'd personally love to feel more comfortable initiating relationships with other patient care providers…without seeming awkward, like, trying to build a relationship with pediatricians and pediatric offices in my area. Parents are always bringing their kids to the pediatrician [you know up to age one], and maybe they're looking in the mouth, but like said, if they see something dark on a tooth and it's a one-year-old, like don't put it off. Send them to a pediatric dentist, and so I would love to have that happen, I guess, more routinely and in my community".*

> *"It would be nice if we spoke the same language. My friends in medicine call the electronic health records the EMR, and we call it EHR. And regardless of what we call it, we can access theirs, and they can't access ours. That's a problem if we are co-treating a patient. I mean, to go further, they often use abbreviations or terms that I'm completed unfamiliar with. It all makes inclusivity difficult".*

The fourth question contemplated continuing education opportunities for healthcare professionals in the workforce. It solicited participants to think about their existing workloads and identify their preferred method for receiving meaningful training for IPE and CP. Focus group participants had an affinity towards in-person, hands-on, and interprofessional group or simulation-type activities. Round table and panel discussions were also identified as being ideal for collaborative learning. One participant stated:

> *"I'd say definitely not self-paced modules…I get bored…and even the live online presentations remove the ability to really connect. Maybe it's just zoom fatigue talking, but I would prefer to be in person and prefer to do something hands-on".*

The final question looked at the intersection to evaluate the overall value that focus group participants held for IPE and CP training and gauge whether they felt IPE and CP training or continuing education requirements should be mandatory for professional license renewal. Dental professionals all thought it was essential that health professionals in the workforce be trained to practice as interprofessional, collaborative teams and endorsed mandated training for licensure renewal. The session closed by offering the group to provide additional comments or thoughts. Like the conversation that occurred during other segments of the focus group, these remarks were noted in the transcript, aggregated, coded, and categorized within themes. Lastly, the

researcher used member checking to summarize the main points from the discussion and allow for corrections or modifications.

2. Medical Professionals Focus Group

The focus group for medical professionals included physicians with between 10-50 years' experience, holding backgrounds in educational settings, hospital-based settings, federal service-based settings, private practice settings, administration, and research. The same five central questions were posed during this focus group to investigate for previous IPE and CP training, learn about their practical/applied experiences and identify positive or negative outcomes, ascertain their direct IPE and CP needs, learn about their preferred methods for receiving meaningful training, measure their overall value for IPE and CP philosophies, and gauge whether they felt that IPE and CP training, or continuing education requirements, should be mandatory for professional license renewal.

The four IPE and CP trained physicians indicated that training was embedded within their curriculum and remarked that clerkships and rotations allowed for interactive, collaborative experiences. Interestingly, none of the collaborative interactions reported occurred with dental students/dental professionals, and minimal interaction transpired with pharmacy students/pharmacy professionals.

The second set of questions/prompts looked at practical or applied experience. Participants were asked to think about a time when they either applied IPE and CP concepts in the workplace and recognized a positive outcome or a time that they failed to apply concepts and recognized potential impacts by the gap in communication. Responses included:

> *"Let me, let me start off because this is a real-life event. An orthopedic surgeon was in the OR and was ready to start cutting into an ankle, and the nurse said, wait, you've got*

the wrong ankle. He already made a one-inch incision and said, whoa. He caught it right before it got into anything more than just a few stitches".

"Yeah, the crazy OR stories actually aren't so crazy. I've been around long enough to know about situations when big mistakes were made due to a lack of communication. I've never amputated the wrong leg, or anything like that, but back when we used film, I've been guilty of looking at a chest x-ray backward and mistaking the right side for the left".

"This is going to sound bad, and I don't mean it that way, but when I have time, I feel like I can be more methodical and really listen to others who are present with me…for instance, bedside with a patient. There have been opportunities where I've really learned from a nurse or a social worker. I'm just not wired with that ***stop and listen*** *mindset, so it doesn't come naturally".*

"I agree, and I'm the same way. I'm very old school. I had no training whatsoever. We were taught to be silos and demigods."

"There is just so much that we don't know about other team members. There are things that nursing doesn't understand about the backside workflow of a resident or a physician, and things we don't understand about their backside workflow".

When asked to reflect upon their own experience and identify their needs, some remarkable comments included:

"Well, just with the programs you mentioned like workshops and boot camps….it intrigued me, and opportunities like that can not only be good for someone like myself but also our trainees. I don't know that our residents have that type of training available to them".

"So, we do multi-disciplinary rounding. Although it's been a little bit hesitant and with COVID, you know the last year and a half it's been less than it should be in there, but and 100% fully support that…but I'm not sure that there's any more I could learn because we're already doing it, I mean maybe there's some updates or some better ways of doing it, I suppose it might be worthwhile".

"I am also the clerkship site director for internal medicine at our hospital, and we have had several instances where we've had both medical and podiatry students together on the floor at the same time, and I've noticed a lot of respect when they work together."

For preferences about methods for receiving IPE and CP training, in-person activities and round table and panel discussions were the top choices. When inquiring about the importance of IPE and CP training, all physicians in the group found the training very important. Still, when

asked if training should be required for licensure renewal, three of the eight physicians said "no." As a follow-up, the researcher solicited the three physicians, opposed to mandated training, to provide a brief rationale for the disapproval. One physician responded:

"I think there's a burden of requirements already."

The other two physicians agreed. The three physicians opposed to mandatory IPE and CP training for licensure renewal represented the following demographics:

- Gender- males (n=2), 1 female (n=1)
- Race/Ethnicity- White (n=3)
- Age- 51> (n=3)
- Formal IPE and CP Training- No training (n=3)

Lastly, the researcher allowed participants to ask questions and share final comments. The session ended with member checking by summarizing the main points of the discussion and allowing for modifications. Once again, focus group recordings were transcribed and coded, and themes were identified.

3. Nursing Professionals Focus Group

The focus group for nursing professionals included nurses with between 6 months-46 years' experience, holding backgrounds in educational settings, hospital-based settings, military-based settings, home-health settings, private practice settings, and administrative roles. Again, the five central questions were posed using the above structure. In addition, three of the four IPE and CP trained nurses indicated that training was embedded within their curriculum, and one shared that she participated in an IPE workshop while in school.

The second set of questions/prompts looked at practical or applied experience. Participants were asked to think about a time when they either applied IPE and CP concepts in the workplace and recognized a positive outcome or a time that they failed to apply concepts and recognized potential impacts by the gap in communication. Thought-provoking comments included:

> *"When I was a new RN, I remember being introduced to this a social worker, and a doctor, and a dietitian, but I was never told how we were supposed to work together."*
>
> *"I think for me personally, just as a new nurse um…I caught something that I mean was in the chart, but my nurse was going to give them medication and do a dressing change, but we were not supposed to do that. I'll say it was nice to kind of feel like you're on the same page as your preceptor. They were like, oh okay, you're listening, you're learning, and you're reading".*
>
> *"You know, the doctors go in to get consent for surgeries, and I was in with a physician while he explained (in his way) the surgery, and then just left and said okay get the signature from the patient. When I talked to the patient afterward, it was clear to me that she didn't understand a word, he said. And she didn't know what to do. She was going to sign it because he was a doctor, but she didn't understand it, so I went back outside I said I'm sorry, but you need to go back in, and in layman's terms, re-explain" Needless to say, my assertiveness wasn't well-received."*
>
> *"Sometimes medication errors were made. I feel like nurses are diligent in trying to prevent errors. I'd double and triple check medications before they were dispensed or delivered, but there were times when the doctors would, and there was a misunderstanding with the dose".*
>
> *Sadly, a lapse in communication recently happened. Reports weren't being read by the person responsible. A patient had lung nodules that weren't caught until a different radiologist stumbled across them. Now the biopsy confirmed early-stage cancer. Normally, based on that other radiologist report, she would have just had another scan in three months. That's why a multi-disciplinary team is so important.*

The third set of questions/prompts probed participants to reflect on their experience and identify their direct needs in terms of IPE and CP. Once again, explanations were rooted in multilayered introspection. Some examples were:

> *"For me, I think that just continuing to learn ways to communicate, and trying to understand the other professions. Social workers, case managers, OT, PT, we need to*

> *continue learning about each other because it can really have an impact on improving patient outcomes".*

> *"I'm trying to create a culture of safety right now in our organization. An awareness campaign can assure someone that it's okay to question, and it's okay to just say, hey, I have a question about this".*

In terms of preferred methods for receiving meaningful training for IPE and CP, nurses in the focus group felt that virtual meetings have been convenient for getting larger groups to participate. Still, they agreed that in-person, panel discussions, and hands-on activities, serve interprofessional concepts best. A specific comment was:

> *"Panel discussions are great. I think you'll learn to engage and respect the other person's perspective".*

Nurses in the focus group collectively endorsed mandated training for licensure renewal. The session closed by inviting the group to provide additional comments and thoughts and again completion of member checking. Transcribed data were coded and evaluated for patterns and themes.

4. Pharmacy Professionals Focus Group

Finally, the focus group for pharmacy professionals included pharmacists with between 1-14years' experience, holding backgrounds in peri-operative settings, ambulatory care settings, retail pharmacy settings, and administrative roles. Following the structure mentioned above, the five central questions were again applied to obtain pharmacists' perspectives in the workforce. The four IPE and CP trained pharmacists indicated that training was embedded within their curriculum, and additional training was received through rotations, workshops, and collaborative experiences.

Next, participants were asked to think about their practical or applied IPE and CP experience and focus on recognized outcomes. Some distinct comments were:

> *"It's a common occurrence that diabetic patients are referred to me to help fix their regimens. Doctors sometimes prescribe medications without understanding if it's an affordable option for the patient".*

> *"I would definitely have to agree. It's almost hourly some days. There was one time when a provider put in two very different IV drugs that do very different things, and luckily it was caught before it got to the patient because it needs a weight and so yeah, but I mean, those are things that we deal with on a daily basis".*

Participants also evaluated their own needs for IPE and CP and felt that it was essential to keep advancing the field. For example, a pharmacist in the group remarked:

> *"With expansions in healthcare, new specialties seem to pop up every day. Having a special focus is a great thing, but providers need to know how to work with you".*

Preferences for receiving meaningful training for IPE and CP included simulation activities and in-person, hands-on experiences. All pharmacists in the group felt that IPE and CP training should be required for re-licensure. Participants were allowed to ask questions and share final comments. Lastly, the researcher used member checking to summarize the main points from the discussion and allow for corrections or modifications.

5. Combined Focus Group Data

Data from the four focus groups were combined to assess health professionals as a concise interprofessional unit. The researcher used a systematic and sequential process for transcribing, reviewing, and evaluating data. The transcription process was achieved using a dual review technique. First, the researcher replayed the Zoom recording and conducted a visual and audio inspection of the data. The visual assessment aspect looked at body language and checked for non-verbal cues. The virtual nature of the focus group might have limited the ability to fully assess body language, but nothing notable surfaced. For the audio assessment portion, the researcher manually transcribed the focus group discussion and began circling keywords or phrases that were spoken. Next, the auto-transcription feature in Zoom was deployed to provide

the transcribed conversation in a typed format. Once again, the researcher circled keywords or phrases within the transcript. Finally, the data were compared and cross-checked. This process effectively avoided the possibility of overlooking essential findings and helped build intra rater reliability.

The survey was delivered using an outlined script to elicit responses that addressed the research question. The deliberate design justified using a semantic, deductive approach that employed predetermined themes to support the research question. Themes considered data based on IPE and CP *context* and data representing a recognized *culture*. Subthemes materialized based on repetitious patterns and were reviewed for alignment with the themes and research questions. For example, subthemes for *knowledge, values, confidence, and communication* were assigned to the context theme, while *collaboration* and *change* were connected to the *culture sub*theme. Thematic saturation occurred when no new themes emerged. Various lists and tables were used for organizing, grouping, and restructuring. Content analysis processes were exercised through frequency counting and visual inspection for category clusters. Attention was drawn to potential differences in the way participants used words to confirm similarities and accurately assign codes. Repetitive codes by the same person were considered to safeguard against over-counting a code's frequency. The table below illustrates the cyclical process used for sorting, segmenting, categorizing, and analyzing relationships among codes (Table XI). It also displays a strategy that separated output as holding either beneficial or detrimental impacts on theories for IPE and CP.

Table XI- Combined Focus Group Themes, Subthemes, and Codes

Combined Focus Group Data- Themes • Subthemes • Codes • Frequencies					
Theme	**Subtheme**	**Codes- Beneficial**	**Frequency**	**Codes- Detrimental**	**Frequency**
Content	**Knowledge**	Catch mistakes	30	Make mistakes	30
		Compliant	10	Unknowing	31
		Correctness	21	Untrained	31
		Credentials	6	Viewed as unknowledgeable	9
		Expertise	25		
		Mid-level provider	1		

		Foundational	7		
		Observe & learn	2		
		Outlined workflow	19		
		Prioritize	6		
		Real-life	4		
		Skilled	23		
		Understand roles	28		
	Confidence	Assertive	2	Challenged	3
		Authority	5	Hesitance	11
		Concerted effort	2	Intimidation	3
		Decision-making	23	Over-step	1
		Experienced	24	Overwhelmed	1
		Initiate	1	Unsure	5
		Lead	18		
		Take control	18		
	Values	Appreciation	11	Feel burdened	16
		Beneficial to patient care	23	No time	11
		Effective	6	Not appreciated	7
		Enlightening to learn what others do	4	Not equal	1
		Patient-centered	7	Viewed as non-essential	4
		Supportive	1		
		We work better together	7		
	Communication	Allow input	3	Accusations	4
		Come together	2	Challenging	9
		Consulting on care	3	Commands	2
		Not afraid to ask	3	Different language	4
		Open door policy	1	Miscommunication	24
		Share view-points	2	Misunderstanding	20
		Reciprocal	1	Offensive	3
				Only part of the story	2
				Technical terminology	4
Culture	**Collaborative**	Build a network	5	Barriers	25
		Collaboration is necessary	19	Not welcome	8
		Overlapping roles	2	Power struggle	2
		Teamwork	16		
		Walk in someone else's shoes	2		
	Change	Improve relationships	22	Harmful	2
		Lower risks	25	Heavy stress	8
		Many opportunities	5	Mistrust	7
		More training	32	Need to get better	2
		Need to work with more professions	13	Too much pressure	3
		Positive outcomes	7		
		Trust	3		

Chapter V. DISCUSSION AND CONCLUSION

A. Discussion

1. Quantitative Data Outcomes

This study aimed to examine whether IPE and CP knowledge, skills, and values differed among healthcare professionals who received formal IPE and CP training compared to those who did not receive formal training. Using a survey instrument, which exhibited internal validity, provided greater conviction for survey data evaluation.

Overall, results indicated a notable increase in IPE and CP knowledge, values, and confidence for health care professionals who received formal training. In ranking order, formal training in IPE and CP had the greatest positive impact on confidence demonstrating IPE and CP skills, followed by increased values, and lastly, knowledge-base. A similar comparison looked at trained and untrained practitioners within the same discipline and once again found increases in knowledge, values, and confidence [when practitioners were formally trained], albeit not at a significance level.

Survey questions were also reviewed to identify specific areas of weakness. In terms of knowledge, most incorrect answers were associated with questions that tested knowledge for TeamSTEPPS concepts. TeamSTEPPS is an evidence-based program built around teachable, learnable skills to improve collaboration and communication. The framework employs communication, leadership, situation monitoring, and mutual support as the fundamental principles for this model. (AHRQ, 2018). Next, looking at individual questions about confidence, participants collectively felt most confident "*forging independent relationships with other professionals to improve care and advance learning,"* and least confident, *"managing ethical dilemmas specific to interprofessional patient/ population-based care*." Once again, deficiencies

were isolated and revealed that underdeveloped competence in team-based care seemed to hold probability for the lack of confidence. Lastly, in gauging values, participants held the greatest values for the notion that *"Interprofessional communication skills are important for improving patient outcomes."*

In general, survey methods in this exploratory study were helpful in reviewing workforce differences between IPE and CP trained and untrained healthcare professionals. Findings indicated that untrained professionals might hold substandard knowledge and values for IPE and CP and hold less confident demonstrating IPE and CP skills. These outcomes are reminiscent of constructivism-based theories, which guided this study and attributed one's actions and behavior to lived experiences. The Experiential Learning Theory, which framed this project, and attributes knowledge as a transformation from experience, provides additional validation. Both theories support the conceptualization that training for IPE and CP enhances processes for effectively delivering patient care.

2. Qualitative Data Outcomes

The Zoom© meeting platform served as a beneficial tool and created ease for data collection. The recording allowed the researcher to listen and observe, with minimal note-taking. Recordings were securely stored in the Zoom© cloud and deleted at the end of the study, which satisfied the data protection requirements for the University of Illinois at Chicago, Institutional Review Board. Additional benefits of using this virtual platform were that it was easy to access, allowed subjects from across the United States to participate, and was cost-effective. Focus groups held an equal representation of IPE and CP trained and untrained practitioners, and data findings allowed the researcher to take a deeper dive into divergences between these groups.

The purposeful design of uni-professional focus groups created a safe space and stimulated thought-provoking feedback. Particularly intriguing comments were included in the results section to support the transcribed, coded data and bring a more comprehensive understanding for the group discussions. Among all healthcare professionals in this study, dental professionals represented an unmistakable outlier. Interactions between dental professionals and practitioners from other healthcare disciplines were infrequent and inconsistent. Historically, dentistry and medicine have existed in distinct categories, with an instinctively unnatural relationship. Consequentially, the team-based, collaborative approach for delivering care must be learned rather than assumed. Dental professionals in the study admittedly lacked confidence in navigating treatment for patients with complex health care needs. This included acknowledging when they needed help from practitioners outside their disciplines and executing a collaborative relationship with other healthcare professionals. Differences between IPE and CP trained, and untrained dental professionals were much less prominent than in other groups. With the practice of dentistry being housed in a setting completely isolated from other healthcare team members, even IPE and CP-trained dental providers had difficulty applying concepts. Frequency for [contextual themed codes] revealed the highest response rate for limitations in knowledge. Frequency for [culture-themed codes] supported a need for improvements in establishing relationships among healthcare professionals.

The focus group with medical professionals revealed considerable differences between IPE and CP trained and untrained physicians. While physicians in the group, who lacked formal IPE and CP training, exuded parallel expertise in medicine, they did not project buy-in for the importance of team-based care. Their value for collaboration appeared less significant. Conversely, the IPE-trained medical professionals in the group expressed profound appreciation

for other members of the healthcare team and the critical roles they play in health care delivery. Contextually themed codes, with subthemes for *knowledge* and *confidence*, held the greatest frequency, with *communication* and the importance of *teamwork* proving less prominent. The most recurrent discussion topics in the medical professionals' focus group were having experience, understanding roles and responsibilities, and taking control. Finally, it is interesting to note that when asked for thoughts about mandatory workforce training in IPE and CP, 30% of the physicians were opposed and represented the only focus group participants in opposition. It is also important to mention that the physicians opposed to mandatory training were all untrained in IPE and CP.

In the focus group that combined IPE and CP trained and untrained health professionals from nursing, nurses without formal training showed a humbleness for their lack of knowledge and interest in understanding benefits associated with team-based care. The theme for *context* and the subthemes for *knowledge* and *values* possessed the greatest response frequency; however, this time, the frequency underscored claims with detrimental aspects instead of beneficial characteristics. Nurses emphasized mistakes associated with physicians' reluctance to collaborate and a lack of confidence related to the nurse's expertise. Although IPE and CP trained physicians [from the medical professionals' focus group] expressed immense appreciation for their partnership, nurses felt valueless on the team. Conversational patterns indicated that nurses felt confident that team-based care promoted positive patient outcomes and lowered risks for adverse events. Nurses were the only focus group that highlighted the patient-centered approach to care, which embraces the patient's opinion in the decision-making process. While all other focus group discussions concentrated mainly on outcomes, the nursing professionals group

considered the patient a factor in the process, applying great significance for the subtheme, *values*.

Finally, the focus group with pharmacy health professionals revealed stark differences between their practice settings and the ability to collaborate interprofessionally. Pharmacists in hospital-based settings had more robust collaborative experiences and greater confidence applying IPE and CP concepts than pharmacists in free-standing, retail-type pharmacies. Moreover, the findings failed to discover significant differences between trained and untrained pharmacists due to variability for applying the concepts in real-life situations. Frequency counting exposed unquestionable concerns regarding mistakes and miscommunication associated with prescribing medication. During the focus group discussion, pharmacists shared factual accounts when [the type or dose] of medication prescribed could have resulted in fatalities. Additionally, they reported the rate of occurrence for these events ensued daily, if not hourly. The impacts associated with errors left pharmacists feeling heavily burdened with risk-related responsibilities. Pharmacists' accounts resonated through the decision-making frequency in the focus group data.

Overall, combined focus group themes were *contextually* prominent and held the greatest subtheme frequency in favor of *knowledge*. Training, expertise, and a heightened ability to recognize mistakes were favorably regarded as a benefit, and a lack of training was associated with mindless mistakes and detrimental to patient care. Groups collectively recognized the importance of understanding the roles and responsibilities of other healthcare team members. Communication was highly ranked as a barrier to accomplishing team-based care. Discipline-specific terminology, and the lack of universal [electronic health] records, were recounted as impediments for applying a collective approach to a patient diagnosis and treatment. Health

professionals in the study, collectively, felt that IPE and CP training were essential requirements for combatting team-based barriers in the workforce and that interactive, collaborative experiences, synchronous panels, and round table discussions would be best for providing meaningful training.

Theoretically, focus group outcomes aligned with the Experiential Learning Theory and the Adult Learning Theory, which served as guiding principles for this study design. Participants consistently applied observations and life experiences to correspondingly contemplate processes and perform functions. Furthermore, they exhibited characteristics and beliefs [developed through maturation] that enabled them to take a stance and focus on problem-based solutions. Health professionals who endorsed IPE and CP theories showed increased readiness to learn and improve their skills. However, regardless of their health profession, participants indisputably agreed that safe and reliable patient care is a common goal, supporting the Adult Learning principle focused on *relatable learning*.

In summary, **uni-professional** data revealed that IPE and CP training generated minor differences and a general lack of statistical significance for knowledge, values, and confidence among trained health professionals compared to their untrained counterparts. However, aggregated data, which compared **interprofessional** results between IPE and CP trained practitioners to untrained practitioners, showed ssalient improvements. The Experiential Learning Theory and the Adult Learning Theory informed the research and allowed the researcher to conceptualize the study findings. Analytic induction further allowed the researcher to shift exploratory concepts to produce deductive logic.

B. Study Strengths

While COVID-19 placed constraints on the original study design, procedures that were initially hindered were perhaps strengthened. For example, with an inability to host in-person focus groups, sessions were held using the online meeting platform, *Zoom*©. This process was cost-effective, time-efficient, and offered easy accessibility in hindsight. Participants logged in from the comfort of their homes or workplaces, which eliminated the burden of a commute. Furthermore, the remote nature allowed participants to join simultaneously from any geographic location.

C. Study Limitations

The lack of research and data about interprofessionalism and collaborative practice in the healthcare workforce makes it difficult to draw comparisons, make generalizations, replicate, or think longitudinally. This limitation was addressed by applying established theories supported by relevant and applicable literature. In terms of quantitative data, some portions of the survey relied on participants' self-reported perceptions about confidence, which might influence subjectivity and bias. To combat these concerns, the study was rendered as a low-stakes inquiry, and participants were assured that there were no direct benefits or impacts from their contributions to the study.

Focus group limitations were also considered. Open discussions are often dependent on the participants' ability to reconstruct or recollect experiences and can sometimes provoke responses that participants feel will be socially desirable. Measures employed to respond to these limitations and minimize distortion of focus group data included using a script to steer conversations and intended responses, a review of definitions for terms, and verbal verifications to ensure that participants understood the questions. The final limitation was related to the

qualitative data analysis. Since the study had a single researcher, the ability to compare coding or cross-compare interpretations from focus groups was eliminated, potentiating bias. Overall, limitations across the study were minimal and didn't present any notable impacts on the research.

D. Recommendations for Future Research

Insights gained from this study can stimulate future research about IPE and CP training for healthcare professionals in the workforce. With gaps in IPE and CP training methods, best practices for workforce education models are critical. Particular focus areas identified in the survey data revealed a lack of understanding of TeamSTEPPS concepts. Focus groups produced revelations linked to prominent communication deficiencies. Correspondingly, teaching methods for communication that implore practitioners to "check back" and "close the loop" represent fundamental concepts for TeamSTEPPS.

Academicians often talk about the hidden curriculum and recognize the unintentional benefits of discoveries from an educational design. In addition to understanding differences between IPE-trained and untrained health professionals' skillsets, this study unintentionally exposed a considerable divide between health professionals in the workforce as a whole. Future research that looks at the division between practitioners and aims to remove barriers can support members to form a single team. Training on concepts that look at roles and responsibilities, values and ethics, teams and teamwork, and communication have been established as a framework for training.

E. Conclusion

Historically, healthcare professionals have been trained in uni-professional silos, which steered the vacuum-like mentality into the practice setting. Research and advancements in medicine have uncovered flaws within this logistical design and have prompted a reform for patient care delivery. Health professionals must master competency-based skills to progress through their training programs and practice within their respective fields. Current education philosophies incorporate required competencies for interprofessional education and collaborative practice. While training students has helped transform team-based concepts, untrained professionals in the workforce hold critical IPE knowledge deficits, possess inadequate confidence demonstrating skills, and lack values for interprofessional partnerships.

Implications from this study support the benefits that formal IPE and CP training can provide healthcare professionals in the workforce. Knowledge of IPE and CP concepts increased when practitioners received formal training. Additionally, trained healthcare professionals valued IPE and CP theories and reported having more confidence demonstrating IPE and CP skills. Through semi-structured open discussions, practitioners expressed genuine respect and highly regarded the expertise of their counterparts in healthcare. Common barriers for stimulating team-based care were recognized, and participants collectively testified that future training could be enhanced by increasing interprofessional collaborative experiences. Bridging this gap can strengthen the health care team and expectantly translate into improved patient outcomes.

In conclusion, data outcomes permitted the researcher to reject the research question's (RQ) null hypotheses and accept the hypotheses to corroborate:

- *RQ1-H1 There is an association between formal IPE and CP training among dental, medical, nursing, or pharmacy health professionals in the workforce, and their basic IPE and CP knowledge.*

- *RQ1-H2 There is an association between formal IPE and CP training among dental, medical, nursing, or pharmacy health professionals in the workforce, and their value for IPE and CP.*
- *RQ1-H3 There is an association between formal IPE and CP training among dental, medical, nursing, or pharmacy health professionals in the workforce, and their confidence in demonstrating IPE and CP skills*
- *RQ2-H1 Dental, medical, nursing, or pharmacy health professionals in the workforce feel that patient-care delivery can be improved through a curriculum designed specifically for practicing clinicians*
- *RQ2-H2 Dental, medical, nursing, or pharmacy health professionals in the workforce feel comfortable using various learning platforms*
- *RQ2-H3 Dental, medical, nursing, or pharmacy health professionals in the workforce are willing to complete post-licensure IPE and CP training*
- *RQ2-H4 Dental, medical, nursing, or pharmacy health professionals in the workforce feel that continuing education in IPE & CP should be required for re-licensure*

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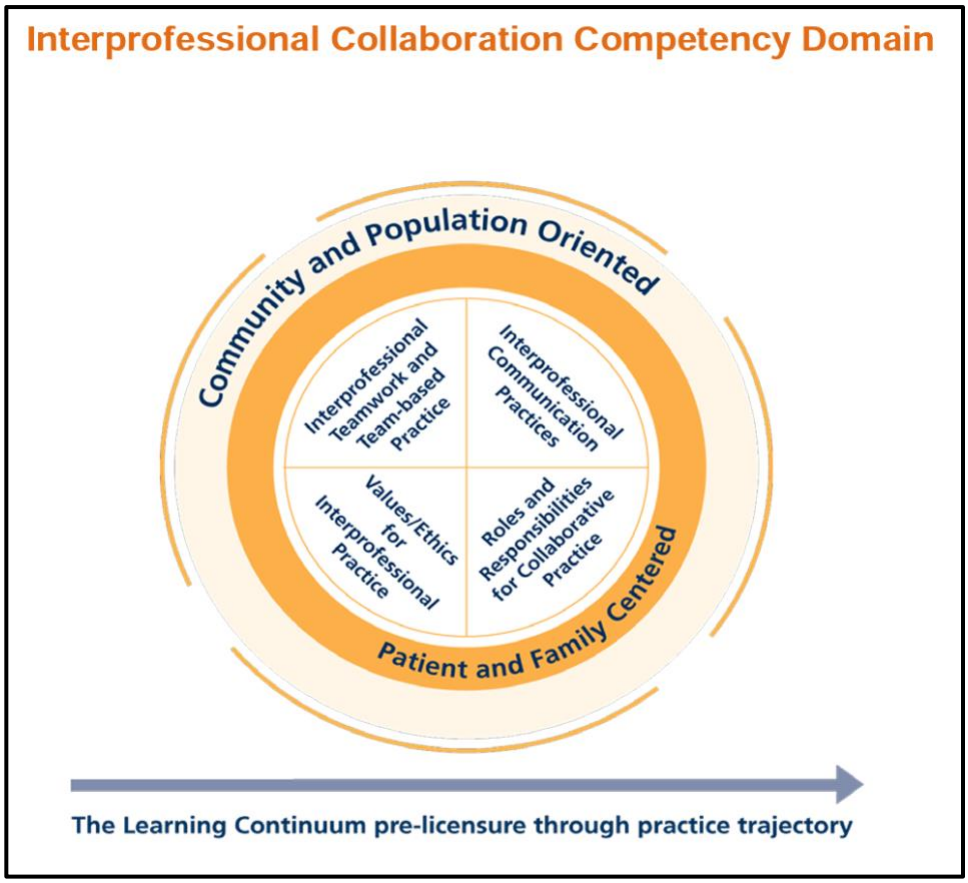
APPENDICES

Appendix A. Core Competencies for Interprofessional Collaborative Practice

Available at: https://www.ipecollaborative.org/ipec-core-competencies



CORE COMPETENCIES FOR INTERPROFESSIONAL COLLABORATIVE PRACTICE: 2016 UPDATE

Four Core Competencies

The core competencies and sub-competencies feature the following desired principles: patient and family centered (hereafter termed "patient centered"); community and population oriented; relationship focused; process oriented; linked to learning activities, educational strategies, and behavioral assessments that are developmentally appropriate for the learner; able to be integrated across the learning continuum; sensitive to the systems context and applicable across practice settings; applicable across professions; stated in language common and meaningful across the professions; and outcome driven.

NOTE: The 2016 updates to the competencies and sub-competencies appear in **bold.**

Competency 1

Work with individuals of other professions to maintain a climate of mutual respect and shared values. (Values/Ethics for Interprofessional Practice)

Competency 2

Use the knowledge of one's own role and those of other professions to appropriately assess and address the health care needs **of patients** and **to promote and advance the health of populations.** (Roles/Responsibilities)

Competency 3

Communicate with patients, families, communities, **and professionals in health and other fields** in a responsive and responsible manner that supports a team approach to the **promotion and** maintenance of health and the **prevention and** treatment of disease. (Interprofessional Communication)

Competency 4

Apply relationship-building values and the principles of team dynamics to perform effectively in different team roles to **plan, deliver, and evaluate** patient/population-centered care **and population health programs and policies** that **are** safe, timely, efficient, effective, and equitable. (Teams and Teamwork)

CORE COMPETENCIES FOR INTERPROFESSIONAL COLLABORATIVE PRACTICE: 2016 UPDATE

IPEC Core Competencies for Interprofessional Collaborative Practice

Work with individuals of other professions to maintain a climate of mutual respect and shared values. (Values/Ethics for Interprofessional Practice)

Values/Ethics Sub-competencies:

VE1.	Place interests of patients and populations at center of interprofessional health care delivery **and population health programs and policies, with the goal of promoting health and health equity across the life span.**
VE2.	Respect the dignity and privacy of patients while maintaining confidentiality in the delivery of team-based care.
VE3.	Embrace the cultural diversity and individual differences that characterize patients, populations, and the **health team**.
VE4	Respect the unique cultures, values, roles/responsibilities, and expertise of other health professions **and the impact these factors can have on health outcomes**.
VE5	Work in cooperation with those who receive care, those who provide care, and others who contribute to or support the delivery of prevention and health services **and programs**.
VE6	Develop a trusting relationship with patients, families, and other team members (CIHC, 2010).
VE7.	Demonstrate high standards of ethical conduct and quality of care in contributions to team-based care.
VE8	Manage ethical dilemmas specific to interprofessional patient/ population centered care situations.
VE9.	Act with honesty and integrity in relationships with patients, families, **communities**, and other team members.
VE10.	Maintain competence in one's own profession appropriate to scope of practice.

CORE COMPETENCIES FOR INTERPROFESSIONAL COLLABORATIVE PRACTICE: 2016 UPDATE

Use the knowledge of one's own role and those of other professions to appropriately assess and address the health care needs **of patients** and **to promote and advance the health of populations.** (Roles/Responsibilities)

Roles/Responsibilities Sub-competencies:

RR1.	Communicate one's roles and responsibilities clearly to patients, families, **community members**, and other professionals.
RR2.	Recognize one's limitations in skills, knowledge, and abilities.
RR3.	Engage **diverse professionals** who complement one's own professional expertise, as well as associated resources, to develop strategies to meet specific **health and healthcare** needs **of patients and populations**.
RR4.	Explain the roles and responsibilities of other providers and how the team works together to provide care, **promote health, and prevent disease**.
RR5.	Use the full scope of knowledge, skills, and abilities of **professionals from health and other fields** to provide care that is safe, timely, efficient, effective, and equitable.
RR6.	Communicate with team members to clarify each member's responsibility in executing components of a treatment plan or public health intervention.
RR7.	Forge interdependent relationships with other professions **within and outside of the health system** to improve care and advance learning.
RR8.	Engage in continuous professional and interprofessional development to enhance team performance **and collaboration**.
RR9.	Use unique and complementary abilities of all members of the team to optimize **health and** patient care.
RR10.	**Describe how professionals in health and other fields can collaborate and integrate clinical care and public health interventions to optimize population health.**

CORE COMPETENCIES FOR INTERPROFESSIONAL COLLABORATIVE PRACTICE: 2016 UPDATE

Communicate with patients, families, communities, **and professionals in health and other fields** in a responsive and responsible manner that supports a team approach to the **promotion and** maintenance of health and the **prevention and** treatment of disease. (Interprofessional Communication)

Interprofessional Communication Sub-competencies:

CC1.	Choose effective communication tools and techniques, including information systems and communication technologies, to facilitate discussions and interactions that enhance team function.
CC2.	**Communicate** information with patients, families, **community members,** and **health team** members in a form that is understandable, avoiding discipline-specific terminology when possible.
CC3.	Express one's knowledge and opinions to team members involved in patient care **and population health improvement** with confidence, clarity, **and** respect, working to ensure common understanding of information, treatment, care decisions, **and population health programs and policies.**
CC4.	Listen actively, and encourage ideas and opinions of other team members.
CC5.	Give timely, sensitive, instructive feedback to others about their performance on the team, responding respectfully as a team member to feedback from others.
CC6.	Use respectful language appropriate for a given difficult situation, crucial conversation, or conflict.
CC7.	Recognize how one's uniqueness (experience level, expertise, culture, power, and hierarchy within the **health** team) contributes to effective communication, conflict resolution, and positive interprofessional working relationships (University of Toronto, 2008).
CC8.	Communicate the importance of teamwork in patient-centered **care and population health programs and policies.**

CORE COMPETENCIES FOR INTERPROFESSIONAL COLLABORATIVE PRACTICE: 2016 UPDATE

Apply relationship-building values and the principles of team dynamics to perform effectively in different team roles to **plan, deliver, and evaluate** patient/population-centered care **and population health programs and policies** that **are** safe, timely, efficient, effective, and equitable. (Teams and Teamwork)

Team and Teamwork Sub-competencies:

TT1.	Describe the process of team development and the roles and practices of effective teams.
TT2.	Develop consensus on the ethical principles to guide all aspects of **team work**.
TT3.	**Engage health and other professionals** in shared patient-centered **and population-focused** problem-solving.
TT4.	Integrate the knowledge and experience of **health and** other professions to inform **health and** care decisions, while respecting patient and community values and priorities/preferences for care.
TT5.	Apply leadership practices that support collaborative practice and team effectiveness.
TT6.	Engage self and others to constructively manage disagreements about values, roles, goals, and actions that arise among **health and other** professionals and with patients**, families, and community members.**
TT7.	Share accountability with other professions, patients, and communities for outcomes relevant to prevention and health care.
TT8.	Reflect on individual and team performance for individual, as well as team, performance improvement.
TT9.	Use process improvement to increase effectiveness of interprofessional teamwork and team-based **services, programs, and policies.**
TT10.	Use available evidence to inform effective teamwork and team-based practices.
TT11.	Perform effectively on teams and in different team roles in a variety of settings.

Appendix B. Approved IRB

Protocol 2021-0724
Exemption Granted

July 19, 2021
Kimberly Fasula, RDH
Curriculum and Instruction
Phone: (312) 996-5513 / Fax: (312) 996-0873

RE: **Protocol # 2021-0724**
"Assessing Interprofessional Education and Collaborative Practice among Licensed Healthcare Professionals"

PIs must complete a COVID-19 Human Subjects Research Review Worksheet for a protocol COVID safety assessment prior to initiating or re-starting any research activities that require in-person contact between research subjects and staff during the COVID-19 pandemic.

For additional information about this process, please refer to the Human Subjects Research Review page on the OVCR website. If you need assistance, questions may be directed to research@uic.edu.

Dear Kimberly Fasula:

Your Claim of Exemption was reviewed on **July 19, 2021**. It was determined that your research meets the criteria for exemption as defined in the U.S. Department of Health and Human Services Regulations for the Protection of Human Subjects [45 CFR 46.104(d)].

Exemption Granted Date: July 19, 2021

Sponsor: None

The specific exemption category under 45 CFR 46.104(d) is: 2

You are reminded that investigators whose research involving human subjects is determined to be exempt from the federal regulations for the protection of human subjects still have responsibilities for the ethical conduct of the research under state law and UIC policy.

Please remember to:

- → Use your research protocol number (2021-0724) on any documents or correspondence with the IRB concerning your research protocol.
- → Review and comply with the policies of the UIC Human Subjects Protection Program (HSPP) and the guidance ***Investigator Responsibilities***.

We wish you the best as you conduct your research. If you have any questions or need further help, please contact me at (312) 355-2908 or choehne@uic.edu, or the OPRS office at (312) 996-1711.

Sincerely,

Charles W. Hoehne
Assistant Director, IRB #7

Office for the Protection of Research Subjects

cc: Maria Varelas

Ara Tekian

Appendix C. Recruitment Flyer

HEALTHCARE PROFESSIONALS NEEDED FOR RESEARCH ABOUT INTERPROFESSIONAL EDUCATION AND COLLABORATIVE PRACTICE

DENTISTRY – MEDICINE – NURSING - PHARMACY

Survey

Are you a licensed healthcare provider in one of the following disciplines: Dentistry, Medicine, Nursing, or Pharmacy?

If so, I invite you to participate in a brief survey evaluating interprofessional education and collaborative practice experiences among practicing providers. By participating, you will be entered into a drawing to win a $100 Amazon gift card.

You might also be invited to participate in a follow-up focus group and be entered into another drawing for a $100 Amazon gift card.

USE THE LINK BELOW TO LAUNCH THE SURVEY

Insert Qualtrics Link

THIS STUDY IS BEING CONDUCTED BY:

Kim Fasula, RDH, MS, MPH
at the University of Illinois at Chicago

kfasul1@uic.edu

Insert Protocol #

Appendix D. Informed Consent

University of Illinois at Chicago
Research Information and Consent for Participation in Research

Principal Investigator/Researcher Name and Title: Kimberly Fasula, RDH, MS, MPH

Department and Institution: Department of Medical Education, College of Medicine

Address and Contact Information: 1840 W. Taylor St. Chicago IL 60612

Contact: kfasul1@uic.edu

About this research study

You are being asked to participate in a research study. Research studies answer important questions that might help change or improve how we do things in the future.

Taking part in this study is voluntary

Your participation in this research study is voluntary. You may choose not to take part in this study or may choose to leave the study at any time. Deciding not to participate, or deciding to leave the study later, will not result in any penalty or loss of benefits to which you are entitled and will not affect your relationship with the University of Illinois Hospital and Health Sciences System (UI Health) and/or University of Illinois at Chicago (UIC). This consent form will give you information about the research study to decide whether you want to participate. Please read this form and ask any questions you have before agreeing to be in the study.

Important Information

This information gives you an overview of the research. More details on these topics may be found in the pages that follow.

WHY IS THIS STUDY BEING DONE?	This study represents a needs assessment designed to identify the level of knowledge, experience, and personal values associated with interprofessional education and collaborative practice among practicing healthcare providers.
WHAT DOES THE STUDY CONSIST OF?	Study participants will be asked to complete a survey electronically through Qualtrics. The survey is designed to gather information from providers who are actively practicing in medicine, dentistry, pharmacy, or nursing. The data collected will be used to assess providers' level of knowledge, experience, and personal values associated with interprofessional education and collaborative practice. Participants will each complete the same survey regardless of prior training in interprofessional education or collaborative practice.
HOW MUCH TIME WILL I SPEND ON THE STUDY?	The survey is expected to take approximately 10 min to complete.
ARE THERE ANY BENEFITS TO TAKING PART IN THE STUDY?	Being in this study will not help you directly. We hope that your participation in the study may benefit other people in the future by helping us learn more about gaps in interprofessional and collaborative practice knowledge, and help correct deficiencies for providing comprehensive, collaborative patient care.
DOES MY PARTICIPATION IN THIS STUDY POSE ANY RISKS?	There are no risks associated with your participation in this study. Data will be de-identified, holding confidentiality for respondents.
QUESTIONS ABOUT THE STUDY?	For questions and concerns about the study, please contact Kimberly Fasula, RDH, MS, MPH, at kfasul1@uic.edu. If you have questions or concerns regarding your privacy rights under HIPAA, you should contact the University of Illinois HIPAA Privacy Office at (844) 341-2201 or hipaa@uillinois.edu.

Please review the rest of this document for details about these topics and other things you should know before deciding whether to participate in this research. Please also feel free to ask the researcher questions at any time.

Who may participate in the study?

You are being asked to participate in the research study because you are a healthcare provider, actively practicing dentistry, medicine, nursing, or pharmacy. Approximately 160 subjects may be involved in this study at UIC.

What procedures are involved?

This research will be performed via this electronic survey. You can choose to receive a study debrief at the end of the study.

What about privacy and confidentiality?

Efforts will be made to keep your personal information confidential; however, we cannot guarantee absolute confidentiality. In general, information about you, or provided by you during the research study, will not be disclosed to others without your written permission. However, laws and university rules might require us to tell certain people about you. For example, study information which identifies you and the consent form signed by you may be looked at and/or copied for quality assurance and data analysis, including Representatives of the university committee and office that reviews and approves research studies, the Institutional Review Board (IRB) and Office for the Protection of Research Subjects, and other representatives of the State and University responsible for ethical, regulatory, or financial oversight of research.

Your email and survey information will be stored on a password-protected computer in a locked office to prevent unauthorized individuals' access. Your survey data will be stripped of all direct and indirect identifiers, and surveys will be destroyed after the study. When the results of the study are published or discussed in conferences, no one will know that you were in the study

Will I be compensated for my participation in this research study?

You will not be offered compensation for participating in this study but will be entered in a drawing to win a $100 Amazon gift card at the end of the survey if you choose.

If you are selected to participate in the follow-up, 30-minute focus group, you would be offered another opportunity to be entered in a drawing to win a $100 Amazon gift card.

Can I withdraw or be removed from the study?

If you decide to participate, you have the right to withdraw your consent and leave the study at any time without penalty.

Signature of Subject

I have read the above information and attest that my questions have been answered to my satisfaction. I agree to participate in this research study. I will be able to download and print a copy of this signed and dated form.

_____ _____

Signature Date

_____

Printed Name

Appendix E. Debrief Form

Debriefing Form for Participation in a Research Study

University of Illinois at Chicago

Thank you for your participation in this study! Your participation is much appreciated.

Purpose of the Study:

You were previously informed that the study's purpose was to identify the level of knowledge, experience, and personal values associated with interprofessional education and collaborative practice among practicing healthcare providers. This research aims to utilize the data to guide future research that can address deficiencies in collaborative clinical healthcare-related to healthcare provider development, with a specific aim for improving healthcare delivery. The study might also guide the development of curriculum and continuing education for health professionals.

Confidentiality:

You may decide that you do not want your data used in this research. If you would like your data removed from the study and permanently deleted, please email Kim Fasula at kfasul1@uic.edu and request to be removed from the study.

Please do not disclose research procedures and/or hypotheses to anyone who might participate in this study in the future, as this could affect the study results.

Final Report:

If you would like to receive a copy of this study's final report (or a summary of the findings) when it is completed, please email Kim Fasula at: kfasul1@uic.edu to make your request.

Useful Contact Information:

If you have any questions or concerns regarding this study, its purpose or procedures, or a research-related problem, please feel free to contact the researcher, Kim Fasula, at kfasul1@uic.edu.

Further Reading(s):

If you would like to learn more about Interprofessional Education and Collaborative Practice, please see the following references: [list out citations]

Please keep a copy of this form for your future reference. Once again, thank you for your participation in this study

Appendix F. Survey

Survey

Modified Interprofessional Education Collaborative Competency Self Efficacy Tool

Please answer #1-6 by selecting the appropriate response

1. What gender do you identify as?
    a. Female
    b. Male
    c. Transgender
    d. Gender Nonconforming/ Non-binary
    e. Choose not to answer

2. What is your race/ethnicity?
    a. Hispanic or Latino
    b. American Indian or Alaskan Native
    c. Asian or Pacific Islander
    d. Black or African American
    e. White
    f. More than one ethnic group
    g. Choose not to answer

3. Please select your age group (years)
    a. 22–25
    b. 26–29
    c. 30–35
    d. 36–40
    e. 41–45
    f. 46–50
    g. 51 years or older
    h. Choose not to answer

4. Please select your health profession
    a. Dentistry
    b. Medicine
    c. Nursing
    d. Pharmacy

5. If you were trained and practice within a specialty or subspecialty area, please indicate that discipline below.

_____

Please read the following description before moving on the question #6.

Interprofessional education is defined [by the World Health Organization] as occasions when "two or more professions (students, residents, and health workers) learn with, about, and from each other to enable effective collaboration and improve health outcomes. Similarly, "collaborative practice occurs when multiple health workers from different professional backgrounds provide comprehensive health services by working with patients, their families, caregivers, and communities to deliver the highest quality care across settings. It is understood that while some health care professionals have received formal training, others have not. For this study, examples of formal training are defined as:

- Interprofessional education, which was embedded in the curriculum of a health professions program
- An interprofessional or collaborative practice certificate or degree program
- An interprofessional or collaborative practice workshop
- An interprofessional or collaborative practice boot camp

Please utilize the description and examples to assist in answering question 6-9

6. Please indicate whether you learned about interprofessional education and/or collaborative practice in your training program.
    a. Yes, I learned about interprofessional education in my training program
    b. No, I did not learn about interprofessional education in my training program
    c. Other- Please comment: _____

7. If you responded yes to question #6, please indicate the rigor of your interprofessional and/or collaborative practice training. Please select **ALL** that apply.
    a. IPE and/or collaborative practice concepts and experiences were embedded in the curriculum of my program
    b. I participated in an interprofessional education and/or collaborative practice workshop
    c. I attended an interprofessional education and/or collaborative practice boot camp
    d. Other (please indicate)
    _____
    e. N/A

8. Please indicate whether you received formal interprofessional education and/or collaborative practice training **AFTER** you completed your program.
    a. Yes, I learned about interprofessional education in my training program
    b. No, I did not learn about interprofessional education in my training program
    c. Other- Please comment: _____

9. If you responded yes to question #8, please indicate the rigor of your interprofessional and/or collaborative practice training. Please select **ALL** that apply.
    a. I completed an interprofessional education or collaborative practice certificate or degree program

b. I have attended an interprofessional education or collaborative practice continuing education (CE) course

c. I participated in an interprofessional education and/or collaborative practice workshop

d. I attended an interprofessional education and/or collaborative practice boot camp

e. Other (please indicate)

_____

f. N/A

10. Please indicate the name of the institution where you completed your program. You may also. enter "choose not to answer" if you do not want to provide this information.

_____

11. Please indicate your current employment setting (i.e., clinical practice, education, FQHC, Public Health setting, research, etc.). You may also enter "choose not to answer" if you do not want to provide this information.

_____

Section I:

Instructions: Please rate how confident you are that you can demonstrate the skills below. Select a number on the scale (1-5) to indicate your selected rating. Higher ratings indicate higher levels of confidence.

1. Explain the roles and responsibilities of other healthcare professionals and how the team works together to provide care.

1- lowest level of confidence 3- neutral 5- highest level of confidence

1	2	3	4	5

2. Engage other health professionals in shared patient-centered problem solving to inform care decisions and priorities/ preferences for care.

1- lowest level of confidence 3- neutral 5- highest level of confidence

1	2	3	4	5

3. Communicate information with healthcare team members to ensure a common understanding of information and treatment/care decisions, avoiding discipline-specific terminology when possible.

1- lowest level of confidence 3- neutral 5- highest level of confidence

1	2	3	4	5

4. Choose effective communication tools and techniques, including information systems and communication technologies, to facilitate discussions and interactions that enhance team function.

1- lowest level of confidence 3- neutral 5- highest level of confidence

1	2	3	4	5

5. Manage ethical dilemmas specific to interprofessional patient/population-centered care situations.

1- lowest level of confidence 3- neutral 5- highest level of confidence

1	2	3	4	5

6. Perform effectively on interprofessional teams, in different team roles, in a variety of settings.

1- lowest level of confidence 3- neutral 5- highest level of confidence

1	2	3	4	5

7. Respect the unique cultures, values, roles/responsibilities, and expertise of other health professionals.

1- lowest level of confidence 3- neutral 5- highest level of confidence

1	2	3	4	5

8. Forge interdependent relationships with other professionals to improve care and advance learning.

1- lowest level of confidence 3- neutral 5- highest level of confidence

1	2	3	4	5

Section II:

Instructions: Please answer the following questions by selecting the appropriate response.

1. The composition of teams for team-based care should take which of the following into consideration:

A. ○ All sites should have the same types of healthcare provider disciplines.

B. ○ Disciplines for each team should be based on matching discipline roles and responsibilities with patient/client population needs.

C. ○ Physicians are generally considered team leaders.

D. ○ The administration will determine teams from providers currently available at each site.

2. Mary Daly, a family nurse practitioner, is part of a specialty care team. The following best describes her role on the team.

A. ○ Coordinating care, monitoring and providing patient/family education, and changing medications for unstable patients.

B. ○ In-patient unit management, bedside care, and medication administration

C. ○ Conducting research, program administration, consultation with site administrators on space and scheduling concerns

D. ○ Genetic counseling and assistance with completion of appropriate insurance forms.

3. Pat Burrows has just joined the care clinic's interdisciplinary team. Pat is a Nurse Practitioner (NP) and has just moved from Illinois to California. To understand what Pat's scope of practice is, Pat and the team need to consult with:

A. ○ The American Nurses Association

B. ○ The American Nurses Credentialing Center

C. ○ The Illinois State Board of Nursing

D. ○ The California Board of Registered Nursing

4. A 39-year-old man with a past medical history of gastroesophageal reflux disease (GERD) presents to the emergency department for substernal chest pain that has been progressively getting worse over the past month. He also reports having lost his PPI

about a month ago and never had it refilled. The workup of the patient reveals hyperlipidemia. Which provider is the best for managing this problem?

A. Cardiologist

B. Emergency department nurse practitioner

C. Emergency department physician

D. Primary care physician

5. Mark Bo, an 89-year-old gentleman, presents to his primary care physician with his daughter, his primary caretaker. His daughter has concerns about her father's sudden weight loss. He has a history of heart disease and high blood pressure but takes his medication as directed. He has early dementia and moderate hearing loss and wears hearing aids and dentures. His daughter states that he has been refusing to eat in recent weeks. The initial workout was completed with a physical exam and bloodwork and was unrevealing. Which provider is the best for future review of this problem?

A. Dentist

B. Emergency department physician

C. Audiologist

D. Cardiologist

6. Which of the following best describes the primary purpose of healthcare organizations implementing the Team STEPPS program?

A. Establish clear lines of authority within the organization

B. Learn strategies and tools to improve performance

C. Resolve conflicts and disagreements among team members

D. Continuously measure and improve patient outcomes

7. Team STEPPS identifies five fundamental principles to enhance team performance and patient safety. These include:

A. ○ Consistency, responsibility, workload, communication, and respect

B. ○ Timeliness, safety, effectiveness, efficiency, and situation monitoring

C. ○ Team structure, communication, situation monitoring, mutual support, and leadership

D. ○ Leadership, information sharing, role clarity, patient safety, and mutual trust

8. Team STEPPS recommends using the SBAR approach to help team members communicate critical information requiring immediate action. SBAR elements include:

A. ○ Safety concern, barriers, actions, and results

B. ○ Situation, background, assessment, and recommendations

C. ○ Supervisor, background, actions, and recommendations

D. ○ Situation, background, actions, and results

Section III:

Instructions: Please indicate your level of agreement or disagreement with the following statements. Select a number on the scale (1-5) to indicate your selected rating. Higher ratings indicate higher levels of agreement.

1. Interprofessional programs and activities weaken required course content in healthcare training programs

1- Strongly disagree 3- neutral 5- strongly agree

1	2	3	4	5

2. Providers should be encouraged to participate in interprofessional practice

1- Strongly disagree 3- neutral 5- strongly agree

1	2	3	4	5

3. Continuing interprofessional education should be mandatory for all practitioners.

1- Strongly disagree 3- neutral 5- strongly agree

1	2	3	4	5

4. Healthcare professionals like using a collaborative approach, including consulting with practitioners from other disciplines and health professions when delivering patient care.

1- Strongly disagree 3- neutral 5- strongly agree

1	2	3	4	5

5. Retraining seasoned clinicians to practice IPE and CP theories is logistically challenging.

1- Strongly disagree 3- neutral 5- strongly agree

1	2	3	4	5

6. Interprofessional and clinical practice training will increase my understanding of clinical problems and enhance my patients' outcomes.

1- Strongly disagree 3- neutral 5- strongly agree

1	2	3	4	5

7. Interprofessional team and teamwork skills are essential for enhancing patient care in current times.

1- Strongly disagree 3- neutral 5- strongly agree

1	2	3	4	5

8. Interprofessional learning helps practitioners understand their professional limitations.

1- Strongly disagree 3- neutral 5- strongly agree

1	2	3	4	5

9. Interprofessional communication skills are important for improving patient outcomes.

1- Strongly disagree 3- neutral 5- strongly agree

1	2	3	4	5

10. I don't need knowledge about other health professions to effectively treat patients.

1- Strongly disagree 3- neutral 5- strongly agree

1	2	3	4	5

Thank you for completing this survey. Your responses are extremely valuable in learning more about interprofessional education and collaborative practice, advancing team-based, patient-centered care, and assisting in guiding future research!

Are you interested in entering you name into a drawing to win a $100 Amazon gift card as a thank you for your time?

b. If yes, select this link to provide your name and contact information (Link here)
c. No, I am not interested in entering the prize drawing

Would you be will to participate in a 45-minute follow-up focus group (via Zoom©)? Focus group participants will have an additional opportunity to enter a drawing to win a $100 Amazon gift card as a thank you for their time.

a. If yes, select this link to provide your name and contact information (Link here)
b. No, I am not interested in participating in a follow-up focus group

SUBMIT

Survey resources:

Hasnain M, Gruss V, Keehn M, Peterson E, Valenta AL, Kottorp A. Development and validation of a tool to assess self-efficacy for competence in interprofessional collaborative practice. J Interprof Care. 2017 Mar;31(2):255-262. doi: 10.1080/13561820.2016.1249789.

Interprofessional Education Collaborative (IPEC) (2011). Core competencies for interprofessional collaborative practice: Report of an expert panel. Washington, DC. Interprofessional Education Collaborative.

Van Draanen, J. IP Knowledge Question Bank. UCLA Health. Available at: https://apps.medsch.ucla.edu/ipe/selftest.html

Appendix G. Answer Key for Survey Section II.

1. B
2. A
3. D
4. D
5. A
6. B
7. C
8. B

Appendix H. Focus Group Workflow and Script

Focus Group Workflow

Instructions for participants

Once focus group participants were identified, they were provided with instructions and the focus group Zoom meeting link via email. The email script can be found below.

Dear X,

Thank you for agreeing to participate in a [45- minute] focus group to expand upon the survey, which you completed related to interprofessional education and collaborative practice. You and seven of your peers will be presented with questions about interprofessional education and collaborative practice and will be asked to share your individual opinions. This data will be utilized for research purposes to enhance interprofessional knowledge and collaborative practice skills among licensed healthcare providers. Please use the following Zoom© link to log into the focus group (insert Zoom© link). If you cannot attend, please inform me as soon as possible to find a replacement participant. As a reminder, your participation will allow you to enter into a drawing to win a $100 Amazon gift card.

Please let me know if you have any questions about this focus group. Thank you in advance for your dedication to advancing team-based, patient-centered care!

Focus group outline

- Welcome

  Script: Good [evening], and welcome to this session. Thanks for taking the time to join me to talk about interprofessional education and collaborative practice. My name is Kim Fasula, and I'm a PhD candidate from the University of Illinois at Chicago. For my dissertation, I am researching the role of interprofessional education and collaborative

practice in the workplace. This exploratory study uses surveys and focus groups to gather data and evaluate improvement needs. Everyone in this group is an X (i.e., dentist). I will be holding focus groups with providers from medicine, nursing, and pharmacy as well. During this session, I will pose several questions and ask members of this group to respond. There are no right or wrong answers, but possibly differing viewpoints. Please feel free to share your point of view even if it differs from what others have said. I'm just as interested in negative comments as positive comments, as all information is helpful. As I mentioned, this focus group is being conducted for research purposes. You are asked to keep all information discussed confidential. I will also uphold confidentiality. None of your comments will be identifiable to you. Please be respectful when others are talking. Also, please mute your cell phone so that the session is free of distractions. This session will last approximately 45 minutes and will be recorded to allow me to engage without taking too many notes fully. Are there any questions before we start?

- Introductions
    - Ask participants to introduce themselves, state how long they have been in practice, and indicate their practice setting.
- Focus group prompts and questions
    - Central question 1 -previous experience
        - The survey you completed offered definitions for the terms interprofessional education and collaborative practice. As a reminder, interprofessional education is defined [by the World Health Organization] as occasions when "two or more professions (students, residents, and

health workers) learn with, about, and from each other to enable effective collaboration and improve health outcomes. Similarly, "collaborative practice occurs when multiple health workers from different professional backgrounds provide comprehensive health services by working with patients, their families, caregivers, and communities to deliver the highest quality care across settings. It is understood that while some health care professionals have received formal training, others have not. For this study, examples of formal training are defined as:

*Interprofessional education, which was embedded in the curriculum of a health professions program

*An interprofessional or collaborative practice certificate or degree program

*An interprofessional or collaborative practice workshop

*An interprofessional or collaborative practice boot camp

- Can you take me back to your training and tell me about how your program did or didn't teach concepts for interprofessional education or collaborative practice?

- Central question 2- practical or applied experience
  - As an Advocate Illinois Masonic Medical Center employee, I receive a daily email called "shared patient safety." These emails highlight mistakes created by one health care professional which was caught and resolved by a different healthcare professional. Some examples of "good catches" are a pharmacist who alerts a physician because she recognizes that a

medication prescribed is contraindicated with a patient's current medications, or a caseworker informs the nurse that the patients' name change has not been updated on their treatment plan, which might delay a scheduled surgery. Medical errors are commonly highlighted in news stories, exposing adverse events that occur when health practitioners fail to communicate or provide collaborative concepts.

- Can you tell me about a time when you didn't apply these concepts in practice, and it either negatively impacted care or resulted in providing less than ideal processes for delivering care?

- Central question 3- direct needs
  - A few years ago, I attended a talk by an IPE guru who outlined components of an effective patient hand-off.
  - Concerning IPE and CP, what would you like to learn more about, or what skills would you like to gain or improve upon?
- Central question 4- continuing education
  - Which type of continuing education platform do you typically participate in in-person lectures, synchronous webinars, asynchronous computerized modules, panel or round table discussions, or hands-on or simulation activities?
  - Which type of continuing education platforms do you prefer or feel more comfortable in?
  - Tell me how you navigate and plan for continuing education based on your current workload and responsibilities.

        - Have you taken any continuing education courses that specifically focused on interprofessional education or collaborative practice?
    - Question 5- Intersection
        - Current methods for educating health professions students IPE and CP training are an accreditation requirement. Education is grounded in interprofessional core competencies to teach students about teams & teamwork, roles & responsibilities, values & ethics, and interprofessional communication.
        - How important do you think it is for healthcare providers to be trained to practice collaboratively and why?
        - How would you feel if the state of Illinois required healthcare providers to complete IPE and CP training for re-licensure?
    - Question 6- Final Question
        - Are there any points that you feel that we didn't address?
- When asking questions, use probes like: "Can you explain further" or "Can you give an example"

VITA

Education

2022 Candidate	PhD-Curriculum & Instruction in Health Professions Education, University of Illinois at Chicago
2016	MPH-Massachusetts College of Pharmacy and Health Sciences
2015	MS in Dental Hygiene-Forsyth at Massachusetts College of Pharmacy and Health Sciences
2014	Certificate in College Teaching- Curriculum, Teaching, and Learning in Public Health, University of Illinois at Chicago, School of Public Health
1999	AAS in Dental Hygiene, Kennedy King College at University of Illinois at Chicago, College of Dentistry
1991	BS in Biology, Loyola University-Chicago

International Education

1986	LaSalle Foreign Exchange Program, Saint-Germain-en-Laye, France

Fellowship

2009	Associate Fellowship, World Clinical Laser Institute

Professional Appointments

2020-Present	Program Coordinator, Teach_2_Reach Program, Advocate Illinois Masonic Medical Center, Department of Dentistry
2020-Present	Director of Hygiene & Clinical Development, Webster Dental Care
2019-Present	Director of Interprofessional Education, Chicago Medical School at Rosalind Franklin University of Medicine and Science
2019-Present	Instructor, Chicago Medical School at Rosalind Franklin University of Medicine and Science
2019-2021	Instructor, Fox College Dental Hygiene Program
2018-2020	Director of Hygiene, Chicagoland Smile Group
2016-2018	Clinical Assistant Professor, UIC College of Dentistry

2014-Present	Dental Hygiene Licensing Board Examiner, Central Regional Dental Testing Service (CRDTS)
2014-2018	Director of Clinic Operations, UIC College of Dentistry, Department of Orthodontics.
2012-2018	Dental Hygiene Provider, Faculty Dental Practice, UIC College of Dentistry
2012-Present	Dental Hygiene Licensing Board Examiner, The Commission on Dental Competency Assessments (CDCA-WREB-CITA)
2012-2014	Director, Faculty Dental Practice, UIC College of Dentistry
2012-2016	Clinical Instructor, UIC College of Dentistry
2005-2012	Clinical Instructor, Kennedy King College Dental Hygiene Program
1999-2018	Dental Hygienist, Dr. Michael O'Meara, Water Tower Dental LTD, Chicago, IL
1999-2002	Dental Hygienist, Dr. Karim Baksh, Chicago, IL
1999-2001	Dental Hygienist, Dr. Anthony Contino, Chicago, IL
1992-1997	Dental Assistant, Dr. Donn Chung, Chicago, IL

Licensure and Certifications

CPR/BLS- Certified
Core Disaster Life Support- Certified
Laser-Assisted Periodontal Therapy- Certified
Local Anesthesia- Certified & Licensed
Nitrous Oxide Sedation- Certified
Registered Dental Hygienist- Certified & Licensed
Public Health Dental Hygienist- Certified
Research Investigator- Certified
TeamSTEPPS- Certified

Awards/Recognitions

2017	Faculty Travel Award-UIC College of Dentistry
2014	Induction into Omicron Kappa Upsilon (OKU), National Dental Honor Society

Faculty Experience

2022	Faculty Facilitator, Interprofessional Team Immersion Program, University of New England and Rosalind Franklin University of Medicine and Science
2020-Present	Faculty, Interprofessional Collaboration Series, Advocate Illinois Masonic Medical Center, Department of Dentistry, General Practice Residency Program
2020-2021	Co-Director, Illinois Dental Hygienists Association- Public Health Dental Hygienist (PHDH) Certification Program
2020-2022	Course Director & Faculty, Rosalind Franklin University of Medicine and Science- HIPS 515- Foundations of Interprofessional Practice
2019	Faculty Facilitator, Rosalind Franklin University of Medicine and Science- HIPS 515- Foundations of Interprofessional Practice
2019-2021	Course Director & Faculty, Fox College- DH 106-Head and Neck Anatomy
2019-2021	Course Director & Faculty, Fox College- DH 107- Histology & Embryology
2019-2021	Course Director & Faculty, Fox College- DH 160- Oral Pathology
2019-2021	Faculty, Fox College- DH 170- Local Anesthesia
2019-2021	Course Director & Faculty, Fox College- DH 210- Bioethics
2019-2021	Course Director & Faculty, Fox College- DH 260- Medical Emergencies and General Pathology
2019-2020	Faculty, Fox College- DH 101 & 102- Anatomy & Physiology
2016-2018	Faculty, UIC College of Dentistry- OSCI 598- Master's Thesis Research
2016-2018	Faculty, UIC College of Dentistry- OSCI 451- Research Methodology
2013-2018	Faculty, UIC College of Dentistry- ORTD 667- Seminar on Orthodontic/Periodontic Diagnostic Procedures

2013-2018	Faculty, UIC College of Dentistry- DAOB 311-Applied Behavioral and Oral Sciences I
2013-2018	Faculty, UIC College of Dentistry- DAOB 312-Applied Behavioral and Oral Sciences II
2013-2018	Faculty, UIC College of Dentistry- ORTD 695-Practice Management, Risk Management, & Compliance
2013-2018	Faculty, UIC College of Dentistry- DAOB 331-Applied Behavioral and Oral Sciences VI

Invited Presentations

2022	American Medical Association, *"The Association between Oral Health and Heart Health"*
2022	Malcolm X College, "Biostatistics and Community Health"
2022	Chicago Dental Society Foundation Clinic, *"Medical Emergencies in the Dental Office"*
2021	Chicago Transit Authority, Employee Wellness Series, *"The Oral Systemic Connection"*
2021	100 Black Men of Chicago Health & Wellness Expo, "*Oral Health & Overall Health*"
2021, 2019, 2018	Malcolm X College, *"Biostatistics and Health Professions Research"*
2020	Illinois Dental Hygienists' Association, *"Medical Emergencies in the Dental Office"*
2018	CSG Hygiene Forum, *"Dental Hygiene from A-Z"*
2018	UIC College of Medicine, *"The Geriatric Patient: An Interprofessional Approach"*
2017-2019	Malcolm X College, *"HIPAA & OSHA Update"*
2017	Malcolm X College, *"Biostatistics in Public Health Part I & II"*
2016	Malcolm X College, *"Intro to Orthodontics: A Dental Hygiene Perspective"*
2015	Malcolm X College, "*Research in Dentistry"*

2014	Kennedy King College, *"HIPAA & OSHA Update"*

Grant Experience

2021	*Improved Access through Mobile Oral Health Service Program* grant, Illinois Department of Human Services, $375,000
2020	*Teach_2_Reach*, medical/dental integration grant, Illinois Children's Healthcare Foundation and Delta Dental of Illinois $200,000
2014	*Plaque HD*, industry-sponsored research grant, TJA Health, LLC $45,000
2014	*Start-up Oral Health Program*, grant, Dentsply Sirona $5,000

Research Interests

2021-Present	Co-collaborator & expert reviewer- Delphi Group- "*Oral care and non-ventilator, hospital-acquired pneumonia"*
2020	Principal Investigator: "*Assessing interprofessional education and collaborative practice among licensed healthcare providers"*
2019	Project Lead: "*Teaching an old dog new tricks: Interprofessional education for licensed providers"*
2019	Co-collaborator: Evaluating program outcomes for interprofessional education, meta-analysis
2018	Research mentor: "*Self-esteem and quality of life (QOL) in orthodontic patients and patients with craniofacial anomalies"*
2017-2018	Faculty collaborator: "*Removing standardized testing from admissions requirements"*
2017-2018	Faculty collaborator: Appraising program models for interprofessional education, scoping review
2017-2018	Research mentor: *"Associations between BMI, obesity, and mandibular growth"*

2015-2016	Principal investigator: Clinical trial focused on the association between oral plaque and C-reactive protein, an inflammatory marker for cardiovascular disease.

Publications

Fasula, K., et al. (2016). Randomized trial of plaque identifying toothpaste: Dental plaque and inflammation. *The American Journal of Medicine,* doi: http://dx.doi.org/10.1016/j.amjmed.2016.09.003

Standing Committees, Board Appointments, Professional Affiliations, and Service Activities

National

2021-Present	Member- American Mobile Dental & Teledentistry Alliance
2019-Present	Exam Coordinator- Central Regional Dental Testing Service (CRDTS)
2018-Present	Team Captain- Central Regional Dental Testing Service (CRDTS)
2017-Present	Member- Nominating Committee- Central Regional Dental Testing Service (CRDTS)
2017-Present	Alumni/Student Mentor- Massachusetts College of Pharmacy and Health Sciences (MCPHS University)
2016-2017	Member- Nominating Committee- American Dental Education Association (ADEA)
2015-Present	Member- American Academy for Oral Systemic Health
2014-Present	Member- Central Regional Dental Testing Service (CRDTS)
2014-Present	Member- American Association for Dental Research (AADR)
2014-Present	Member- International Association for Dental Research (IADR)
2014-Present	Member- American Association for Community Dental Programs
2014-Present	Member- Omicron Kappa Upsilon, National Dental Honor Society, Sigma Chapter
2012-Present	Member- The Commission on Dental Competency Assessments (CDCA)
2005-Present	Member- National Education Association
2005- Present	Member- American Dental Education Association

1999-Present	Member- American Dental Hygienists Association
State	
2021-Present	Member- Advocate Children's Hospital Community Health Council Board
2020-Present	Member- Illinois Board of Dentistry, Illinois Department of Federal and Professional Regulation
2020-Present	Member- COVID-19 Task Force, Illinois State Dental Society
2020-Present	Board Member- Chicago Dental Society Foundation Board of Trustees
2020-Present	Member- Illinois Public Health Association
2019-Present	Executive Committee Member- Illinois Dental Hygienists Association
2019-Present	General Assembly Chair- Illinois Dental Hygienists Association
2017-Present	Member- Allied Dental Personnel Committee, Illinois State Dental Society
2012, 2014	Volunteer Hygienist, Mission of Mercy, Illinois State Dental Society
2005-Present	Member- Illinois State Dental Society
1999-Present	Member- Illinois Dental Hygienists Association
University	
2020-Present	Member- Evaluation and Assessment Subcommittee, Chicago Medical School at Rosalind Franklin University of Medicine and Science
2020	Participant- Site visit, The Liaison Committee on Medical Education (LCME), Chicago Medical School at Rosalind Franklin University of Medicine and Science
2019-Present	Member- Steering Council for Interprofessionalism, Rosalind Franklin University of Medicine and Science
2019-Present	Member- Graduate Medical Education Committee, Chicago Medical School at Rosalind Franklin University of Medicine and Science
2019-Present	Member- Interprofessional Academic Committee, Rosalind Franklin University of Medicine and Science
2018	Member- UIC Interprofessional Education Steering Committee
2017-2018	Senator- UIC Senate
2017-2018	Member- UIC Senate Committee on Educational Policy (SCEP)
2017-2018	Lead- Dentistry and Medicine, Interprofessional Education: Spring Program, The University of Illinois at Chicago

2014-2018	Member- Graduate College Thesis Committee, The University of Illinois at Chicago
2014	Member- Women's Leadership Symposium Planning Committee, The University of Illinois at Chicago
2013-2016	Member- Diversity Advisory Committee, The University of Illinois at Chicago
2013-2016	Chair- Chancellors Committee on the Status of Women, The University of Illinois at Chicago
2013-2016	Mentor- Academic Professional Mentoring Program, The University of Illinois at Chicago

College

2021-Present	Phase II Review Task Force, Chicago Medical School at Rosalind Franklin University of Medicine and Science
2020-Present	Work Group Lead- Strategic Plan: Improving Community Outcomes, Chicago Medical School at Rosalind Franklin University of Medicine and Science
2020-Present	Work Group Member- Strategic Plan: Enriching and Expanding the Interprofessional Community Clinic, Chicago Medical School at Rosalind Franklin University of Medicine and Science
2020-Present	Work Group Member- Strategic Plan: Enhancing Interprofessional Opportunities, Chicago Medical School at Rosalind Franklin University of Medicine and Science
2020-Present	Member- Prairie State College Advisory Board
2019-Present	Member- Graduate Medical Education Committee, Chicago Medical School at Rosalind Franklin University of Medicine and Science
2017-Present	Member- Malcolm X College Advisory Board
2017-2018	Member- Admissions Committee, UIC College of Dentistry
2014-2018	Member- Diversity Advisory Committee, UIC College of Dentistry
2014-2018	Research Judge- Clinic & Research Day, UIC College of Dentistry
2013-2018	Peer Mentor- UIC College of Dentistry

2012-2014	Social Media Administrator- UIC College of Dentistry
2012-2014	Member- Marketing and Communications Committee, UIC College of Dentistry
2012-2015	Member- Dental Service Plan Management Committee, UIC College of Dentistry

Department

2017-2018	Member- Search Committee for Department Chair, UIC College of Dentistry, Department of Orthodontics
2017-2018	Member- Search Committee for Faculty Position, UIC College of Dentistry, Department of Orthodontics
2016-2018	Research Mentor- UIC College of Dentistry
2014-2018	Member- Admissions Committee, UIC College of Dentistry, Postgraduate Orthodontics

Organization/Corporation

2019-2020	Member- Clinical Quality Council Committee, Chicagoland Smile Group

Community

2021	Volunteer- Bernie's Book Bank, Lake Bluff, IL
2017	Volunteer Hygienist, Mission Veterans Smiles: Veterans Day event Chicago, IL
2010	Volunteer Hygienist, Goldie's Place, Chicago, IL
1999-2014	Oral Health Educator, Bridgeport Catholic Academy, Chicago, IL
1999-2009	Oral Health Educator, St. Jerome, Chicago, IL

Scientific Journal or Text

2015-2016	Lead author and Principal Investigator-Clinical Trial "Associations between oral plaque and risk factors for cardiovascular disease". *American Journal of Medicine.*
2017	Scientific Reviewer-Jones & Bartlett Learning