5-2023

# How to Collaborate and Not Just Coexist: An Explanatory Sequential Mixed Methods Study on the Impact of a Physician and Nurse Interprofessional Education Program on the Development of Early Career Pediatrician Communication Skills and Collaborative Behaviors Once in Practice

Elizabeth L. Wueste
*University of the Incarnate Word*, epayne@student.uiwtx.edu

# HOW TO COLLABORATE AND NOT JUST COEXIST: AN EXPLANATORY SEQUENTIAL MIXED METHODS STUDY ON THE IMPACT OF A PHYSICIAN AND NURSE INTERPROFESSIONAL EDUCATION PROGRAM ON THE DEVELOPMENT OF EARLY CAREER PEDIATRICIAN COMMUNICATION SKILLS AND COLLABORATIVE BEHAVIORS ONCE IN PRACTICE

by

ELIZABETH LEIGH PAYNE WUESTE

A DISSERTATION

Presented to the Faculty of the University of the Incarnate Word
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

UNIVERSITY OF THE INCARNATE WORD

May 2023

# ACKNOWLEDGMENTS

I was able to achieve this milestone with the help of several people as a support, guide, mentor, challenger, and teacher. I would like to begin by thanking my Chair, Dr. Norman St. Clair. Dr. St. Clair has been a beacon of hope and the main driver in this process as both an advisor and confidant. His expertise in all facets of research allowed me to be creative and technical, showing that there are many ways to get to the end but sometimes you must "turn the bottle" to see it from every angle. Next, I'd like to thank Dr. Stephanie Hartzell, my quantitative content expert and mathematical genius. Her patience as I filled in my own knowledge gaps is unprecedented. Next, I'd like to thank Dr. Daniel Schumacher as my content expert and all-around amazing educator in the field of Pediatric Education. Your constant positive motivation and thoughtful feedback allowed me to dig deeper into the "why" and to look for attainable solutions to an otherwise daunting problem. I'd like to thank the UT Health San Antonio Department of Pediatrics for supporting my dream of creating this program almost a decade ago and ensuring I had the financial means and the protected time support of the trainees to design, implement, and lead the Buddy program. Finally, my greatest thanks go to the UT Health San Antonio Pediatric Resident graduates and the UHS nurses who participated in the program each year and provided their insights and experiences to ensure this program was meeting the needs of the current providers and creating a better work environment for everyone. Without them there would be no Pediatric Buddy Program.

Beth Wueste

# DEDICATION

To my wife, Sarah, for her unwavering support and love throughout our life and specifically during this arduous journey. Sarah, you are my everything and I love you to the moon and back. To my father, for his steady hand and constant reinforcement that I am capable of breaking old patterns and creating new roads. To my late mother, who taught me to love learning and to never give up even when faced with adversity, through darkness we will find the light. To all my friends, family, and colleagues who never stopped asking me “are you done with your paper?”: your questioning ensured I kept writing. My deepest and most sincere gratitude to everyone.

# HOW TO COLLABORATE AND NOT JUST COEXIST: AN EXPLANATORY SEQUENTIAL MIXED METHODS STUDY ON THE IMPACT OF A PHYSICIAN AND NURSE INTERPROFESSIONAL EDUCATION PROGRAM ON THE DEVELOPMENT OF EARLY CAREER PEDIATRICIAN COMMUNICATION SKILLS AND COLLABORATIVE BEHAVIORS ONCE IN PRACTICE

Elizabeth Leigh Payne Wueste, PHD

University of the Incarnate Word

Healthcare organizations are challenged to build and develop interprofessional (IP) teams capable of delivering effective patient care (Tang et al., 2018). Historically, these multiple professional roles are not formally educated together but are all expected to work in unison once they enter practice (El-Hanafy, 2018). This lack of relational foundation has led to age-old conflict between the physician and nurse roles on the care team (Stein et al., 1990). This conflict has been attributed to a lack of role definition or an overemphasis on hierarchical structures, poor communication, and the inability of physicians to collaboratively work with their nurse counterparts (Crawford et al., 2012). These barriers can lead to ineffective patient care planning and management, decreased work satisfaction, and workplace tension between essential roles (Wang et al., 2018). The problem is that no standard curriculum currently exists in the literature that is being actively used in U.S. based graduate medical education programs that uniformly places importance on IP collaboration between nurses and physicians, yet there is an identified need in the clinical care setting (Allenbaugh et al., 2019; Looman et al., 2020, Wang et al., 2018).

This explanatory sequential mixed methods study aimed to determine the impact that participation in an interprofessional education (IPE) program had on graduates' perceptions of collaborative behaviors and effective communication skills once in practice by answering the following research questions: Is there a difference in the participants' perceived abilities across the six domains as they recall them on the Interprofessional Collaborative Competency Attainment Survey (revised; ICCASr) pre and post-assessment? Is there a difference between factor outcomes on the ICCASr pre/posttest between nurses' and physicians' professional roles? Is there a correlation between posttest factors for each participant group (nurses and physicians)? How do nurses and physicians describe their communication and collaboration with each other after participation in the program? The quantitative questions were answered using the ICCASr and the qualitative question was answered using open-ended survey questions and interviews.

This mixed methods explanatory sequential design was divided into two distinct phases. Phase 1 involved the collection and analyses of quantitative data via the ICCASr and Phase 2 used qualitative methods derived from open-ended questions and a semi-structured interview. In Phase 1, quantitative data were gained by distributing the ICCASr to 53 graduates from an IPE program, representing the first three cohorts with a return of 22 responses. The ICCASr underwent paired t-tests, independent t-tests, and correlational statistics that were calculated to determine if there was a difference in the participants' perceived abilities across the six designated domains: communication, roles and responsibilities, conflict management/resolution, team functioning, collaboration, and collaborative patient-family centered approach pre and postintervention. In Phase 2, qualitative data were collected using responses from the open-ended questions on the ICCASr to reveal how the program impacted the participants' perceived abilities to communicate and collaborate postintervention to offer better patient care. These

initial data led to the development of 12 semi-structured interview questions. Virtual interviews were conducted with eight survey participants who volunteered to share their experiences. The qualitative data utilized multilevel descriptive, holistic, and In Vivo coding for analysis to locate significant themes from the position of the participants' own experiences in relation to the overall study aim.

The ICCASr survey results showed a statistically significant difference in participants' perceptions on all areas of the IP domains from pre to postintervention. There was no significant correlation between patient-family centered approach associated with conflict management/resolution or communication or team functioning associated with communication for the nurse role. The results of the descriptive statistics and comparative and correlation analyses supported the focused interview questions. The qualitative data generated four essential thematic interpretations as to the intervention's impact: foundational deficits, construction of perspectives, development of relationship and organizational influence. Each essential theme was influenced through the discovery of categorizing data obtained from the participants' narratives. The quantitative results were supported by qualitative insights, allowing for a more robust picture from the perspective of the learner as to how the intervention impacted their learning and why this type of programming is important. Using a mixed methods study design and sequential process aimed to determine perceptional behavior change and gain a deeper understanding of how participation in one institution's early intervention program impacted communication skills and nurse–physician collaborative relationships.

At the conclusion of the study, it was determined that the ICCASr was an effective assessment tool in identifying perceived changes in behavior as it relates to IP programming even years after an intervention. The statistical improvement identified between pre and post-

learning surveys supports the effectiveness of this specific program to provide IPE knowledge long term. The themes that emerged from the interviews provided an in-depth look at how this specific program impacted the participants and revealed areas needing attention when developing future IPE programs, such as moving away from modules and simulation. There was a comprehensive belief that the deficit in IPE training in formal healthcare education created the most significant barrier to providing team care. IPE interventions should fill these gaps by providing the necessary job-related soft skills to ensure the positive collaboration between roles in the clinical care setting. Intervention activities should provide a pathway for participants to reflect on their own paradigms as they learn to see the "other" as a human instead of a role, which has not previously been role modeled but will change practice approaches immensely. Having a well-developed early career intervention will improve IP relationships immediately but also provide transferable skills to teach others as providers advance their careers. Finally, to truly support IPE education in the clinical care setting, there must be organizational support to maintain positive relationships and build trust among employees. Mixed methods designs are a novel approach to healthcare education research and provide a deeper dive into the lived experience and shared meaning of learners. The results of this study are meaningful for healthcare education as no other study has assessed the impact of a longitudinal IPE intervention between physicians-in-training and nurses. This study supports the importance of developing a standard IPE curriculum using interactive, relationship-driven activities as a meaningful and necessary part of training to preventatively reduce conflict and proactively develop effective IP communication and collaboration skills to meet healthcare organization and patient needs once in practice.

TABLE OF CONTENTS

LIST OF TABLES ..... xvii

LIST OF FIGURES ..... xviii

CHAPTER 1: INTRODUCTION ..... 1

Introduction to the Problem ..... 1

Context of Problem ..... 2

Statement of the Problem ..... 4

Research Gap ..... 6

Purpose of Study ..... 7

Rationale ..... 8

Role of Researcher ..... 9

Research Questions ..... 9

Phase 1: Quantitative Questions—ICCASr Survey ..... 10

Phase 2: Qualitative Interview and Survey Questions ..... 10

Phase 3: Mixed Methods Question ..... 10

Significance of the Study ..... 10

Conceptual Framework ..... 11

CHAPTER 2: LITERATURE REVIEW ..... 14

Communication ..... 14

Patient Care and Safety ..... 15

Hierarchy ..... 15

TABLE OF CONTENTS—Continued

CHAPTER 2: LITERATURE REVIEW

Conflict Management/Resolution ..... 16

Roles and Responsibilities ..... 16

Team Functioning ..... 17

Shared Decision Making/Collaborative Patient-Family Centered Approach ..... 18

Self-Identity Formation ..... 18

Collaboration and IPE ..... 19

IPE ..... 19

Formal Education ..... 20

Informal Learning and Hidden Curriculum ..... 21

Professional Development Programs ..... 21

PBP ..... 22

Summary ..... 24

CHAPTER 3: METHODOLOGY ..... 25

Positionality ..... 25

Purpose ..... 26

Research Approach Rationale ..... 27

Research Design ..... 27

Theoretical Perspective ..... 27

Participant Sampling ..... 32

Setting/Site ..... 33

TABLE OF CONTENTS—Continued

CHAPTER 3: METHODOLOGY

Instrumentation ..... 34

Instrument Reliability ..... 35

Reliability Analysis ..... 35

Instrument Validity ..... 35

Research Questions ..... 38

Phase 1: Quantitative Questions—ICCASr Survey ..... 38

Phase 2: Qualitative Interview and Survey Questions ..... 38

Phase 3: Mixed Methods Question ..... 38

Data Collection ..... 39

Data Conditions and Analyses ..... 39

Ethical Consideration ..... 41

Limitations ..... 42

CHAPTER 4: QUANTITATIVE RESULTS ..... 44

Return Rate and Data Cleaning ..... 44

Descriptive Statistics ..... 45

Survey Results ..... 46

Research Question 1 ..... 46

Communication ..... 46

Collaboration ..... 47

Roles and Responsibilities ..... 47

TABLE OF CONTENTS—Continued

CHAPTER 4: QUANTITATIVE RESULTS

Collaborative Patient/Family Centered Approach ..... 48

Conflict Management/Resolution ..... 48

Team Functioning ..... 48

Summary ..... 49

Research Question 2 ..... 49

Communication ..... 49

Collaboration ..... 50

Roles and Responsibilities ..... 50

Collaborative Patient/Family Centered Approach ..... 51

Conflict Management/Resolution ..... 51

Team Functioning ..... 51

Summary ..... 52

Communication ..... 52

Collaboration ..... 53

Roles and Responsibilities ..... 53

Collaborative Patient/Family Centered Approach ..... 53

Conflict Management/Resolution ..... 53

Team Functioning ..... 54

Summary ..... 54

Pre and Posttest Summary ..... 54

TABLE OF CONTENTS—Continued

CHAPTER 4: QUANTITATIVE RESULTS

Correlation Statistics ..... 55

Research Question 3 ..... 55

Summary of Nurse Correlations ..... 55

Summary of Physician Correlations ..... 57

Summary ..... 57

CHAPTER 5: QUALITATIVE RESULTS ..... 62

Demographics ..... 62

Thematic Analysis ..... 65

Findings ..... 69

Essential Theme: Foundational Deficits ..... 70

Category Formal Education ..... 71

Category Intra-Educational Divide ..... 74

Category Informal Education/Clinical Training ..... 78

Essential Theme: Construction of Perspectives ..... 81

Category Life Experience ..... 83

Category Relationship to Medicine ..... 85

Category Work Experience ..... 86

Essential Theme Development of Relationship ..... 88

Category Intentional Contact/Interaction ..... 89

Category Relationship Building ..... 91

TABLE OF CONTENTS—Continued

CHAPTER 5: QUALITATIVE RESULTS

Category Safe Space ..... 93

Essential Theme Organizational Influence ..... 94

Category Role Definition/Hierarchy ..... 95

Category Hospital System Processes ..... 96

Category Culture of Leadership Support ..... 99

Patient Care ..... 101

The Impact of a Single Word ..... 105

Understanding ..... 106

Efficiency ..... 106

Insightful ..... 106

Humbling ..... 107

Beneficial ..... 107

Synergy ..... 107

Layered (Scaffolded) ..... 107

Collaboration ..... 108

Summary ..... 108

CHAPTER 6: DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS ..... 111

Mixed Methods Integrated Findings ..... 111

Research Question Synthesis ..... 114

Quantitative Phase ..... 114

TABLE OF CONTENTS—Continued

CHAPTER 6: DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

Qualitative Phase ..... 114

Quantitative Phase ..... 115

Qualitative Phase ..... 116

Quantitative Phase ..... 118

Qualitative Phase ..... 119

Mixed Methods Summary ..... 122

Connection to Theory ..... 123

Essential Intervention Theoretical Development ..... 124

Allport's Intergroup Contact Hypothesis ..... 127

Role Theory ..... 128

Zone of Proximal Development ..... 129

Literature Related to Findings ..... 130

Communication ..... 130

Roles and Responsibilities ..... 132

Collaboration and IPE ..... 133

Conclusion ..... 137

Implications ..... 138

Implications of Recommendation ..... 144

Recommendations for Future Research ..... 146

Summary ..... 147

TABLE OF CONTENTS—Continued

REFERENCES ..... 150

APPENDICES ..... 158

Appendix A Pre-Study 1: Survey Preintervention ..... 159

Appendix B Pre-Study 2: Participant Journal Review ..... 179

Appendix C Pre-Study 2: Intervention Program Reflective Journal Question Prompts ..... 185

Appendix D Pediatric Buddy Program Overview ..... 186

Appendix E Current Study Interview Questions ..... 189

Appendix F IRB Approval Notice ..... 190

# LIST OF TABLES

Table Page

1. Scale Reliability Pre and Posttest .....45

2. Overall Cronbach's Alpha Value.....45

3. Paired Samples T-Test—Nurse and Physician .....46

4. Independent Sample T-Tests—Pretest.....50

5. Independent Sample T-Tests—Posttest .....52

6. Correlation—Nurse.....59

7. Correlation—Physician.....60

8. ICCAS Question 21—Summative Data.....61

9. Interview Participants' Demographics.....64

# LIST OF FIGURES

Figure Page

1. Conceptual Model Process Mapping .....13

2. Quantitative ICCASr Domains IPE Framework.....37

3. Overview of Explanatory Sequential Mixed Methods Study Design.....42

4. Qualitative Coding Process.....68

5. Qualitative Themes .....70

6. Wordle.....106

7. Mixed Methods Integration.....109

8. Qualitative Research Question Analysis.....123

9. Recommendation to Modify Existing IOM Conceptual Model .....144

# Chapter 1: Introduction

## Introduction to the Problem

Healthcare organizations are challenged to build and develop interprofessional teams capable of delivering effective patient care (Tang et al., 2018). Historically, these multiple professional roles are not formally educated together but are all expected to work in unison once they enter practice (El-Hanafy, 2018). This lack of relational foundation has led to age-old conflict between the physician and nurse roles on the care team (Stein et al., 1990). This conflict has been attributed to a lack of role definition or an overemphasis on hierarchical structures, poor communication, and the inability of physicians to collaboratively work with their nurse counterparts (Crawford et al., 2012). These barriers can lead to ineffective patient care planning and management, decreased work satisfaction, and workplace tension between essential roles (Wang et al., 2018).

Additionally, there has been minimal importance placed on the graduate medical education (GME) curriculum to prepare early physicians to enter practice with the tools necessary to effectively work inside of this dyad (Loyal & Fenick, 2020). Given the lack of formal education or training of essential work-related skills, many physicians graduate from residency unprepared for collaborative practice with nurses, leading to a continued state of conflict shown to impact patient well-being. The issues resulting from lacking collaboration and communication failure between these important interprofessional roles have been identified and a need for change has been espoused throughout literature.

The problem remaining is, even with research-supported identified needs, there is still an absence of formal-skill-based interprofessional programming in the GME curriculum to prepare

the next generation of physicians to communicate and collaborate with all members of the healthcare team once they enter practice (Looman et al., 2020).

**Context of Problem**

GME training programs follow the Accreditation Council for Graduate Medical Education (ACGME) core competencies and associated milestones to assess learning and competency in training. The ACGME (2020) offers six core competencies including, "Interprofessional and Communication Skills," driven primarily by a focus on the ability to communicate with patients but noting "other healthcare professionals" in the definition. GME programs lack standard protocols to ensure this learning is taking place, and instead, outcomes are left to the individual program's discretion. The ACGME has recently emphasized interprofessional patient care teams, as evidenced by the inclusion of the Clinical Learning Environment Review. The Clinical Learning Environment Review program provides periodic feedback on six focus areas: patient safety; health care quality; care transitions; supervision; well-being; and professionalism to ACGME-accredited institutions and their clinical learning environments "to improve how clinical sites engage resident and fellow physicians in learning to provide safe, high-quality patient care" (Weiss et al., 2014, p. 1687).

The topic of interprofessional education (IPE) has gained importance as more variation in job roles has been introduced into team membership, all aiming to provide quality patient care (Looman et al., 2020; Vazirani et al., 2005). In 2009, the Interprofessional Education Collaborative (IPEC) was formed in the United States to include representation from six different health professions to promote, encourage, and advance learning experiences to support team-based care to improve the general population's health outcomes (IPEC, 2020). This collaboration, representing national organizations for nursing, allopathic and osteopathic

medicine, pharmacy, dental, and public health, created core competencies to guide the development of curriculum focused on interprofessional collaboration (IPEC, 2020). The IPEC's mission is to promote and prepare healthcare providers through the development of their core competencies, resources, and assessment tools to train providers to enter the clinical environment ready for interprofessional collaborative practice. Additionally, IPEC objectives include influencing change with policymakers to have the unceasing support of IPE among all government agencies, university leadership, and health system leaders (IPEC, 2020). Since the initial report, the IPEC has made headway in IPE by furthering partnerships from six to 15 as of February 2016.

Just a year before the U.S. based IPEC collaborative was established, the Canadian Interprofessional Health Collaborative (CIHC) was funded and charged with completing a review of IPE competencies and existing IPE frameworks and developing a competency-based framework for interprofessional collaboration in Canada in 2008 (CIHC, 2010). The collaboratives' overall goal is to improve the health outcomes of patients through creating IPE and collaborative practice for health system users. The CIHC is made up of "health organizations, health educators, researchers, health professionals, and students from across Canada" (CIHC, 2010, p. 2). The CIHC used in-depth reviews to determine their framework and based the interpretation of their competencies through the lens of Rogiers and Tardif (CIHC, 2010). The competency framework based on Rogiers and Tardif is intended to help learners understand the learning process, distinguish situations by relevance, apply learning, and integrate appropriate learning elements (CIHC, 2010). The completed framework is intended to guide IPE and collaborative practice for all professions in a variety of contexts by informing "curriculum and professional development programs for interprofessional education and enlighten

professional practice for interprofessional collaboration" (CIHC, 2010, p. 6). The CIHC has been successful in disseminating their work globally, in turn creating several studies reviewing program creation and outcome assessment of the framework in various healthcare situations in Canada (Arden et al., 2022; Grymonpre et al., 2016; Hepp et al., 2015; Kaba et al., 2018; Orchard & Bainbridge, 2016).

However, even with a structured set of guidelines, buy-in from national stakeholders, and an internationally shared understanding of the need for IPE, the IPEC collaborative has yet to effectively implement its curriculum into U.S. medical school education (IPEC, 2020). Studies have been done with a focus on needs assessments and possible observational tools but there is still no literature on outcomes from programs developed using the vetted modules in residency programs. The ACGME has yet to create and distribute a standardized curriculum or assessment in IPE, leaving GME programs to continue to develop their own with varying success (Al Achkar et al., 2018). The inability for U.S. based healthcare education programs to integrate these competency-based learning modules may be due to a lack of awareness that they exist, a lack of training, an inability to facilitate additional modules into already tight timelines, and the ineffectiveness of module learning when the topic requires human interaction to develop communication and collaboration skillsets (Wang et al., 2018).

**Statement of the Problem**

Physicians-in-training and nurses are expected to collaborate and communicate effectively in the clinical setting to provide team-based patient care but have no formal education or training on how to do so effectively. Given these educational deficits, the negative effects can be seen in a perpetually strained working relationship between nurses and physicians in their individual professional fulfillment and ultimately in patient outcomes (Allenbaugh et al., 2019;

Looman et al., 2020; Wang et al., 2018). Thus, this study aimed to explore the longitudinal impact of one institution's interprofessional program—based on IPEC and CHIC principles—provided to physicians-in-training and nurses now in practice. This information was gained by using the Interprofessional Collaborative Competency Attainment Survey (revised; ICCASr) to determine if there is a difference in the participants' perceived abilities across the six domains and how the program impacted their perceived abilities to communicate in their practice, enabling them to work more collaboratively to offer better patient care. The impact supports the gap for an actionable program to build these necessary skills across all U.S. GME programs.

Most formal education completed by nurses and physicians is clinically focused, textbook driven, and completed in silos without the required training to function effectively together in the clinical environment postgraduation (Loyal & Fenick, 2020; Wang et al., 2018). Physicians often leave medical school with limited clinical experience, mostly in the final 2 years of school, and tend to disregard their seasoned nurse counterparts' experience, highlighting the gap between their book knowledge and practical clinical skills **(**El-Hanafy, 2018**)**. Nurses, on the other hand, are trained in teams from Day 1 and enter the clinical environment with a basic understanding of their abilities and limitations (Tang et al., 2018). Therefore, it is important to determine individual reflections on this hierarchical perspective and work to provide a shared definition of how individuals in these roles self-identify these gaps noted in current literature. The qualitative portion of the study explored this relationship dynamic through an open-ended survey question and one-on-one interviews aimed at locating the core of this relationship phenomenon to determine if these behaviors are role specific or a result of lacking formal IPE and a failure by the organization to support the culture of inclusion.

One of the biggest problems explored in this study was how this relationship-based conflict impacts effective communication and collaboration between nurses and physicians. Physicians are not formally taught how to effectively work inside of the interprofessional team and the tension between the two roles can lead to a breakdown in the most essential function they share, patient care (Joint Commission on Accreditation of Healthcare Organizations, 2005; Wang et al., 2018). This study sought to determine how the formal education provided to participants improved their collaboration and communication ability via participant interviews and how that learning has continued into practice through the ICCASr. The impact of these data could offer new knowledge to the literature through vetted research to move beyond need assessments into the development phase of IPE in GME programs focused on building higher-functioning healthcare teams through effective communication skills.

**Research Gap**

The largest gap in the research to date is the limited review of programs from the view of physicians-in-training or graduate medical educators. Current studies have predominantly focused on late-career nurse and physician perspectives based on conflict within the team, leaving a gap in research on the effective early education of and views from the physician-in-training and early-career nurse (Chorostecki et al., 2016; Hitawala et al., 2020; Matziou et al., 2014; Nair et al., 2012; Price et al., 2014). There is minimal research on early intervention programs to prepare physicians-in-training to enter practice with the knowledge, skills, and attitudes necessary to work with their nurse colleagues to offer the best patient care possible. Current research has done little to add to this need and still lacks evidence of a vetted program or curriculum to bridge the gap between these roles and their shared goal of patient care. Most of the current research has examined communication via patient satisfaction but lacks insight into

how communication can be improved with developed communication skills between providers. This study aimed to fill that gap and highlight the impact of a preventative program on the collaborative skills of three graduating cohorts of physicians and nurses after receiving a focused program aimed at skill development and relationship building.

**Purpose of Study**

The purpose of this explanatory sequential mixed methods study was to evaluate the impact of a structured IPE program on its graduates' use of effective communication and collaborative behaviors postintervention as a preventative means to later career-related conflict between nurses and physicians. The Pediatric Buddy Program (PBP) is an interprofessional intervention created in a South Texas pediatric residency program and has not been multi-institutionally administered. It is a 1-year program focused on real-life interactions between these two groups to advance all other communication (Appendix C). It is aimed at allowing relationship formation at a personal level, understanding of others' education and experiences, taking place after hours for social development and on the hospital floor for project and shadowing into the day-to-day lives of the other. The buddy program is an interactive intervention based on IPEC competencies and driven by a foundation in andragogy utilizing the paradigms of constructivism and pragmatism. There is ample evidence that these groups have conflict. There is evidence that skills in communication are taught with varied theoretical frameworks but are implemented and assessed in isolation. There is literature to support residents leaving training without necessary job-related skills or an understanding of organizational demands. The PBP aims to prepare residents to enter the workforce with a realistic perspective of the hospital system and their nurse counterpart's role in that system. There is a focused attempt to dismantle legacy bias between the groups and begin a conversation on even ground.

There were two previous exploratory studies completed on this intervention to review and analyze the initial reaction to the intervention and immediate learning absorbed in relation to program objectives by reviewing the pre- and post-survey (Pre-Study 1 – Appendix A) and reflective journals (Pre-Study 2 – Appendix B) from Cohort 1–3 participants at an academic healthcare center in South Texas. The current study examined the first three cohorts of the program and its impact on their communication and collaboration abilities. The physician-in-training inclusion criteria for program participants was as a mandatory educational component of training. The nurse inclusion criteria included more than 3 years of service, a desire to participate, and approval from the nursing supervisor. Cohorts varied in size as incoming interns changed based on available funding and nurses changed based on interest and inclusion criteria. Cohort 1 had eight interns and six nurses, Cohort 2 had 13 interns and seven nurses, and Cohort 3 had 14 interns and five nurses. The current study conducted a quantitative-based postintervention survey intended to measure longitudinal communication skill development and qualitative open-ended question and interviews to determine current perceptions of the collaborative relationship between nurses and physicians-in-practice. The final phase was the interpretation and multilevel analyses of all data.

**Rationale**

Despite limited research on communication or role development interventions between nurses and pediatric residents in the United States, the need still exists, as evidenced in ACGME requirements and the work of the IPEC collaborative. To better understand how quality patient care results from health team collaboration, an interprofessional program was created by a pediatric residency program alongside their hospital partners to fill these knowledge and skill gaps. The program intended to strengthen the relationship between residents and nurses from

Day 1 of the residents' 3-year training and not as research. However, over 8 years, there has been an observable change between these groups seen in improved peer evaluations and greater inclusion of nurses in family centered rounds, leading to the desire to explore the impact of this specific IPE curriculum in the early stages of training using a formal approach.

**Role of Researcher**

My interest in conducting this research is related to my 20 years of professional experience working in GME training physicians via relevant knowledge and skills to provide team-based care. My academic background in adult education guides me in ensuring the transfer of relevant and meaningful learning in the residents I train and put into the world to provide care to children. As the creator of the interprofessional program, I was in a unique position to assess the impact of this novel curriculum and utilize those data to create a standard program used nationally, driven by learners' needs and peer reviewed research. I was also acutely aware that I needed to continuously work to mitigate my bias as I moved through the research process. Residency may be the only time a physician has the protected time and access to directed learning that can build on the theory learned in medical school and provide the application of necessary best practices. Understanding this critical timeframe, I wanted to improve the educational curriculum offered to ensure the focus on each clinical service includes the knowledge and skills in effective communication to provide collaborative medicine that will positively impact health outcomes.

**Research Questions**

The initial assumption was that participants would agree, through self-reflected response, that involvement in an early career program provided them knowledge to understand their role on an IPE team, the ability to effectively communicate with all team members in practice, and

the skills necessary to collaboratively provide the best patient care. The study aimed to answer the following questions under the outlined three phases.

***Phase 1: Quantitative Questions—ICCASr Survey***

1. Is there a difference in the participants' perceived abilities across the six domains as they recall them on the ICCASr pre- and post-assessment? (quantitative)
2. Is there a difference between factor outcomes on the ICCASr pre/posttest between nurses' and physicians' professional roles? (quantitative)
3. Is there a correlation between posttest factors for each participant group (nurses and physicians)? (quantitative)

***Phase 2: Qualitative Interview and Survey Questions***

1. Questions were developed to answer the "why" and "how" to the quantitative questions.

***Phase 3: Mixed Methods Question***

The final phase used a mixed methods approach, combining the ICCASr survey with open-ended questions and follow-up interviews. This phase provided a more comprehensive understanding of how nurses and physicians describe their communication and collaboration with each other after participating in the program. (mixed methods question/hypothesis)

**Significance of the Study**

The current literature has identified specific reasons for those already facing challenging professional relationships and has noted the need for interventions based on system failures such as patient satisfaction and medical errors and for individual needs such as burnout and work satisfaction as shown in the literature review (Ishak et al., 2009, Van Bogaert et al., 2013). However, effective programming providing education and skill-building geared towards the training years between interprofessional team members has only been minimally identified with

a predominance towards simulation learning and 1-day workshops. Given the importance effective healthcare teams have on patient care, it is imperative to ensure that future generations are provided tools to reflect on themselves and their practice and given skills to work effectively within their healthcare system and community (Ishak et al., 2009, p. 240).

This study went beyond the current literature gap to evaluate the effects of a novel intervention program using vetted IPE guidelines and required accreditation to give those necessary work skills to physicians. This study highlights the impact of IPE and community formation in the training curriculum, before the time-of-service-related conflict, in preparing future pediatricians and nurses to collaborate once they enter practice. The significance of this research is its support in the creation of an intervention program to develop communication and collaboration skills to improve practice habits between team members, which is currently lacking in formal and training education. Additionally, the study provides support of a structured curriculum for all future medical education programs to improve job-place interactions through clarity in role responsibility and shared decision making, in turn increasing the abilities of this dyad to provide the best patient care possible once in practice. Given the plethora of literature on the adverse effects of poor nurse–physician relationships, this study bridges the gap in literature by using decades of supported data to implement and assess an early career interprofessional program as a mechanism to prevent future conflict and to support the importance of providing physicians-in-training the tools necessary to collaborate and communicate with their nurse colleagues prior to entering practice.

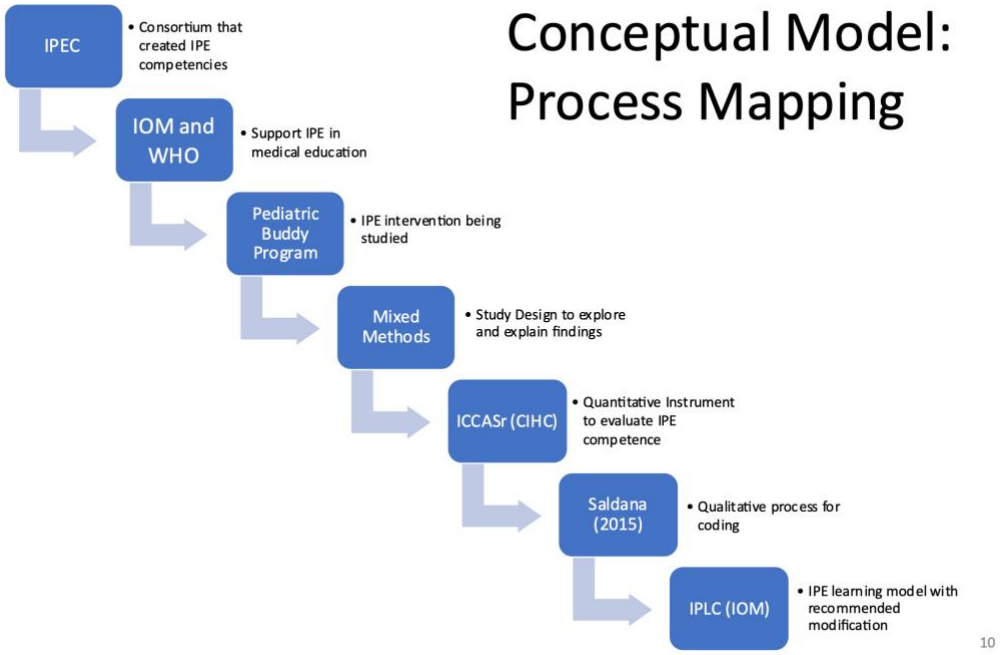
**Conceptual Framework**

This explanatory, sequential, mixed methods study aimed to determine the impact participation in an IPE program had on graduates' reports and perceptions of collaborative

behaviors and effective communication skills once in practice. Unlike the traditional use of a single methodology driven by a predetermined theory or conceptual framework, mixed methods are not committed to a particular philosophical belief system and corresponding sets of theoretical frameworks but instead work to connect induction with deduction, subjectivity and objectivity, and context and generality and develop new terms of abduction, intersubjectivity, and transferability. Additionally, using a pragmatist paradigm allowed the research to hold no allegiance to a particular set of rules or theories as shown through the utilization of an integrative methodology. Figure 1 shows the mixed methods process used to answer various research questions to locate how experience and education in an intervention developed the participants' individual and group knowledge and truths. The quantitative data are framed by the CIHC's Competencies Framework via the ICCASr survey used to gauge the longitudinal impact on perceived communication and collaboration skills postintervention. The newly designed reflective component of an open-ended question on the ICCASr survey as well as one-on-one interviews used a basic interpretive design following a narrative inquiry methodology for data collection. The reason for collecting qualitative data in addition to quantitative findings allowed for exploration into the program participants' shared experiences and helped explain more specifically how the program created meaning using participants' examples and stories to reinforce and add depth to the numerical analyses.

**Figure 1**

*Conceptual Model Process Mapping*




The use of mixed methods offered a more in-depth assessment of the program's effectiveness to determine if learning through knowledge, skills, and attitudes as a preventative measure enhanced physicians' perceptions and behaviors once in the workplace. Using mixed method research to evaluate the long-term impact an early career intervention has on practicing healthcare teams is significant to the field as no other study has included a perception rating score combined with the participants' voices in search of a shared language and group experience to effect behavioral changes.

# Chapter 2: Literature Review

The purpose of this explanatory sequential mixed methods study was to evaluate the impact of a structured IPE program on its graduates' use of effective communication and collaborative behaviors postintervention as a preventative means to later career-related conflict between nurses and physicians. This study was conducted with the intent of identifying factors contributing to the gap in collaboration and communication skills between the healthcare team roles.

The purpose of this literature review was to provide a foundation of knowledge related to the current state of IPE competencies as related to GME such as communication, patient care and safety needs, conflict management/resolution, understanding of roles and responsibilities, healthcare team functioning, shared decision making/collaborative patient-family centered approach, and collaboration. This information supports the need for research focused on assessing IPE competencies in the training years. This review also revealed current gaps in the literature surrounding a lack of standard IP programming or assessment of programs, a missing focus on self-identify formation in relation to team roles and responsibilities, reviews of the hidden curriculum and its impact on training, and the impact of relationship building in applying the IPEC competencies. A critical examination of the current literature regarding IPE competencies and assessments of developed programs provided the information that guided this research, clarified the need to explore the experiences of physicians-in-training and nurses' abilities to communicate and collaborate, and revealed the need for research in this area.

## Communication

The ACGME defines communication as "the effective exchange of information and collaboration with patients, their families, and health professionals" (ACGME, 2022, p. 23).

Effective communication ensures messaging is clear, accurate, complete, detailed, reliable, and courteous, and ultimately must consider the recipient's ability to receive the information and requires the sender's purposes to be met (Prachi, 2018). What could be one of the most important aspects of communication, the relationship between the giver and receiver, is not addressed in the competencies for healthcare training (Martin, 2011). Using these characteristics, it is essential that the healthcare team communicates effectively and collaboratively to ensure patient safety is a priority, overcoming hierarchy through effective conflict management.

### *Patient Care and Safety*

Communication of patient information is expected between nurses and physicians to provide safe care management, but this does not always occur. According to the Joint Commission on Accreditation of Healthcare Organizations (2005), communication failures are the leading cause of sentinel events, many leading to death. During a patient's stay in the hospital, they will encounter numerous providers, which places greater importance on streamlined communication to reduce errors with medications, delays in treatments, pre and postoperative errors, and falls leading to death (O'Daniel & Rosenstein, 2008). Patient safety is the most crucial component of healthcare management, and failed communication can lead to poor patient outcomes for families and the organization (Wang et al., 2018).

### *Hierarchy*

One of the most common barriers that lead to poor communication practices noted in the literature is the normative structure of hierarchy found in healthcare teams that reinforce the physician as the dominant caregiver and the nurse as a supportive role (Matziou et al., 2014). This top-down approach to medicine works directly against the comprehensive health model, as no one person holds all the necessary medical knowledge, nor can one person manage the

numerous needs of a single patient, much less an entire unit (Fagin, 1992). This dyad hierarchy was discussed in more depth in the seminal work, *The Doctor–Nurse Game Revisited* (Stein et al., 1990), which reviewed the nurse and physician relationship's history and continued perpetuation of physician dominance. This power distance can lead to nurses fearing conflict, confrontation, or dismissive behavior from the physician and possibly withholding information. In Stein et al.'s (1990) work, the implied hierarchy spoken about can lead to physicians not readily sharing important information amongst the entire team, leading to patient-management failures (O'Daniel & Rosenstein, 2008).

### *Conflict Management/Resolution*

A study in an acute care setting showed that conflict management is handled differently among nurses and physicians, with nurses often shying away from confrontation (Nair et al., 2012). Nurses tend to approach conflict or difficult conversations with a more collaborative and caring approach but fail to have that information received readily by physicians until they become forceful when conveying their ideas (Nair et al., 2012). To effectively communicate, it is necessary to allow all team members to have ownership of information and a pathway to share the information without fear of retaliation in a streamlined capacity (Rice et al., 2010).

## Roles and Responsibilities

How a healthcare team member identifies the roles, duties, and obligations of others has not been heavily researched between physicians-in-training and nurses from the physician-in-training's perspective. Several qualitative studies have discussed the topic and perceptions of role definition over the years, primarily from the nursing perspective (Amudha et al., 2018; Choristecki et al., 2016; Price et al., 2014). Given the lack of understanding by team members regarding their role, function, and potential for collaboration with other team members, silos are

found on the clinical floor (Fagin, 1992). The nurse and physician team membership are slated for the physician as the primary role, leaving shared decision making as a one-sided endeavor resulting in skewed perceptions of collaboration among the team. A grounded theory study inside an internal medicine residency gathered data on the value physicians place on nurse communication and collected open-ended semi-structured interview data over 2 months. The outcome of this study provided an explanation to the residents' perceptions and can best be exemplified as the nurse role is seen as the workhorse looked at to fill the need of "getting the work done" (Forbes et al., 2020)

### *Team Functioning*

Over the last several decades, there has been a change in doctors' and nurses' roles given the increased focus on patient care and the healthcare system's advanced complexity (Voyer, 2013). When positions are clearly defined and the relationship expectations between the nurse and physician are communicated, the care provided improves and creates a higher level of professional satisfaction (Matziou et al., 2014). The conflict between the two groups can be seen in their differing views of role definition as it pertains to patient management with the nurse applying their knowledge and the knowledge of others to every aspect of patient care, yet the physician who oversees the work continues to believe they are the sole provider of care (Matziou et al., 2014, p. 530). A mixed methods study in two children's hospitals looked at the outcomes from a nurse/resident shadow experience that included a survey to gain both quantitative and qualitative data (Monroe et al., 2021). The study showed that following the experience immediately and at the 6-month mark had lasting improvements to communication, collaboration, role and responsibilities, and team functioning (Monroe et al., 2021). The qualitative section offered insights that the participants found a new and greater understanding of

the other's role, in turn building a more focused approach to communication and collaboration between groups (Monroe et al., 2021).

### *Shared Decision Making/Collaborative Patient-Family Centered Approach*

The sharing of information from nurse to physician is seen as the advocacy of patient needs; however, physicians often do not reciprocate that information sharing and instead choose to work in silos (Nair et al., 2012). Matziou et al. (2014) studied the perceptions of interprofessional communication and collaboration in two public hospitals in Greece. The study used the "communication and collaboration questionnaire" developed by Vazirani et al. (2005) and found nurses did not perceive doctors to collaborate with them on shared decision making, creating a burden on the team. Based on a database search, there have been articles written on shared decision making based on patient satisfaction scores, the rate of return for the organization, and nurses' perspectives on their role in patient care decisions, but the literature lacks the training physician's perspective.

### *Self-Identity Formation*

Education is taught linearly and lacks consideration of individuals' exposures and lived experiences. Communicative action focuses on the transmission and renewing of cultural knowledge with the aim that this process will create mutual understanding. Through the process of communication action, there is an overreaching goal towards developing social unity and integration. It is through this process that individuals begin to form their own identities. Habermas (1984) noted that "how each person develops an identity and molds their personality depends on the interactions their life worlds have with other life worlds" (Health Research Funding, 2017). This reconciliation process is an ongoing compromise that involves multilevel communication, individual response evaluation, and conscious choice to move towards

solidarity. The hoped-for outcome is to "form personal, group, and societal ethics that benefit everyone" (Health Research Funding, 2017).

## Collaboration and IPE

The relationships between physicians and nurses are expected to be functional and positive but are not assessed on how those skills are taught in formal, informal, or professional development pathways. During medical school in the United States, the curriculum is heavily focused on theoretical concepts and process mechanisms for disease profiles and anatomical systems (Matziou et al., 2014). In addition to medical schools, GME has an intended collaboration mission. However, it has not made progress on developing a standard curriculum that reinforces the applicability of collaborative skills such as effective communication and role definition, specifically between the nurse and physician-in-training.

### *IPE*

IPE is not a new concept; its beginnings can be found in as early as the 1960s (Barr, 2009). However, the focus on IPE gained momentum after the World Health Organization (WHO) published a report named, *Continuing Education for Physicians and Learning Together to Work Together for Health*. The beginnings of IPE relied on the concepts of collaboration and teamwork in numerous other fields, which showed potential for the concepts to translate to healthcare with regard to improving patient care and possibly resolving historic tensions between healthcare professionals. Early in discussions, Harden (1998) introduced the idea that healthcare providers from all professions should be given the opportunity to learn not just from but with others in the field as he believed IPE is a requirement for one to become a collaborative provider (Hardin, 1998). The Institute of Medicine released three sperate reports on the status of healthcare in the United States and those acted as an additional driver to the importance of this

type of learning. In 2010, the WHO again published a report noting IPE is a necessary part of healthcare education and detailed its implementation across the globe, stating several professions have embraced the concept (Rodger & Hoffman, 2010). Even after 50 years of development, conversation and support of IPE is still fragmented in U.S. healthcare education, only seemingly developing "a recurring pattern of short-lived efforts to educate health and medical professions students together and the drive to establish IPE clearly lacked sufficient positive drivers" (Jackson & Bluteau, 2009, p. 192). IPE is still in emerging stages throughout the United States and it is clear there is room for improvement. Fransworth et al. (2015) stated that, for these programs to show improvement, there must be opportunities provided to bridge "IPE between academic settings and practice environments through partnerships that embrace interactive methods of teaching that interfaces IPE principles and practices into existing policy, plans, and evaluation of outcomes in the clinical setting" (p. 4).

### *Formal Education*

There is currently no information available supporting that interprofessional communication, role definition, or collaborative behaviors with nurses are required to be taught during the formal education of physicians in the United States (Shafran et al., 2015). In contrast, IPE is a required part of medical students' curricula in other countries, such as Saudi Arabia (Alzamil & Meo, 2020). These collaborative behaviors are imparted to students during their observation of team dynamics during the clerkship years, but the skillsets are not formally reviewed or applied during formal education. Matziou et al.'s (2014) study participants noted that they lacked IPE, which led to communication obstacles between groups. A comprehensive curriculum focused on communication skills for pediatric residents was completed in 2011–2012 and resulted in small improvements to the self-perception of residents' skills using several

domains; however, the research and outcomes were largely focused on communication with patients and not the relational aspect of the team dyad (Peterson et al., 2016). There is competency-based communication curriculum that runs the gamut but nothing that requires doctors and nurses to learn together about how best to collaborate and communicate. Rather, the two most fundamental team members are kept siloed, isolated, and often pitted against one another based on organizational culture and archaic hidden curriculum even though education has evolved into social medicine, requiring the inclusion of multiple roles and experts (Formosa, 2015).

### *Informal Learning and Hidden Curriculum*

Many collaborative job skills are learned postformal education and embedded inside each hospital culture's complex system. The collaborative aspects of healthcare team members are primarily driven by the organizational culture and are not uniform across all care settings. Therefore, physicians-in-training and nurses learn their unit culture through observation, leading to variation depending on role modeling (Tang et al., 2018). Additionally, in residency training, physicians are often taught through the "hidden curriculum" passed down through generations and do not consider current practice skills required for effective interprofessional care management (McGrail et al., 2009). Therefore, the effectiveness of informal trainee learning relies heavily on the hospital culture where they train, the unit culture's mission, and the progress overseeing physicians have made to remove the doctor–nurse game from the clinical learning environment.

### *Professional Development Programs*

Nair et al. (2012) conducted a descriptive study to determine the frequency of collaborative behaviors using the Nurse Physician Collaboration Scale reported by physicians

and nurses in an acute care hospital in the Midwest. The Nurse Physician Collaboration Scale contained 27 items eliciting information about sharing patient information, relationships between the dyad, and the decision-making process. The study found that current research does not offer a shared definition of collaboration by both groups and recommended providing opportunities for creating workshops, open forums, and training programs that directly focus on developing respect, collaborative skills, and working relationships, given the lack of formal education (Nair et al., 2012, p. 119). One training program did an orientation that included residents and nurses. The authors noted that it supported relationship growth and improved communication between the participants with the overall goal to do a follow-up study to determine its impact on improved patient care outcomes (Wright et al., 2013). A Canadian qualitative study aimed to improve collaboration through communication development on a general medicine unit through a four-step decision process using a low-time and low-touch approach. After 2 years of data collection and analyses, the authors found that soft-impact interventions are not effective, and a more developed focus on high-impact activities should be incorporated into all facets of the learning and professional practice environment (Rice et al., 2010). The current studies offer an inside look at the lack of formal and informal learning experiences that have created a focused need for effective professional development programs to fill the gaps.

**PBP**

Two previous exploratory studies were completed on the current study's intervention to review and analyze the initial reaction to the intervention and immediate learning absorbed in relation to program objectives by reviewing pre- and post-surveys (Pre-Study 1 – Appendix A) and reflective journals (Pre-Study 2 – Appendix B) from Cohort 1–3 participants at an academic healthcare center in South Texas. Both pre-studies conducted on the PBP intervention used the

framework of Kirkpatrick's (1994) Four-Level Training Evaluation Model to measure the impact of the programs' transfer of learning by determining a relationship between program learning objectives and skill application in practice. The first pre-study was quantitative to review program pre- and post-surveys focused on Kirkpatrick's Level I assessment of engagement, material relevance, and overall satisfaction with the program dynamics. The initial program's pre and postquestionnaires addressed the program components' objectives and relied on the communication and collaboration among physicians and nurses questionnaire (Vazirani et al., 2005). The pre- and post-surveys aimed to identify individual perceptions based on participants' personal experiences to questions that corresponded to the program curriculum. The second pre-study was qualitative to review the program's reflective journals to address Kirkpatrick's Level II, which reviewed the participants' current knowledge, skills, and attitudes, and Level III, which examined any behavior changes that were applied postintervention. During the program, the participants critically reflected via a journal using prompted questions. The review of these reflective journals was through the theoretic lens of Mezirow's (1997) transformational learning theory. Because transformation occurs through autonomous thinking, this portion investigated how participants constructed, validated, and reformulated the meaning of their experience with the healthcare duo and the program.

The utilization of an unobtrusive review of the participants' reflective journal data helped locate internal themes into the "why" of the program's impact postintervention. Using the Kirkpatrick framework in both pre-studies aided in the evaluation of the effectiveness of the intervention as "each successive level of the model represents a more precise measure of the effectiveness of a training program" (Mind Tools, n.d.). A review of pre/postsurveys and reflective journals were used as metrics to measure reactions and information retention based on

program objectives and activities during and immediately following the intervention. Additionally, focusing on Kirkpatrick's Level III allowed insight into how well the participants were able to apply their training by demonstrating what they know through observable behaviors once in practice, which helped strengthen the current programming. Kirkpatrick's Level IV was not addressed in the pre-studies.

**Summary**

There is limited research on proven strategies to increase effective communication ability, develop shared role definition, or include a competency-based educational program to develop collaborative skills among physicians-in-training and their nurse counterparts together. Strengths in previous work are reflected in the nursing professions' advanced publications from their perspectives in several qualitative studies reviewing interprofessional collaboration skills. Weaknesses in previous work include a significant focus on literature reviews to support the need for these collaborative skills for patient care but lack actionable items for application. Overall, previous work supports implementing a joint skill development program early in training to help improve interprofessional communication between nurses and physicians, in turn advancing patient care and safety once in practice. Of the two articles that researched physicians-in-training, Vazirani et al. (2005) suggested that "early training period is the most effective time to set the groundwork for collaborative practice, for that period is when experienced nurses can assist inexperienced interns" (p. 74). The next research steps should focus on effective programming to teach and assess collaborative skills in U.S. GME from the training physician's perspective to ensure its application once in practice.

# Chapter 3: Methodology

## Positionality

My worldview or ontology as it pertains to this research has been developed through my professional experiences with training physicians in GME through an adult learning methodology for over 20 years and rests in a constructivist view. I believe knowledge is constructed through experience and exposure and for this research that also includes the interaction with specific people and the culture of medicine that work together to build one's "truth" about the world around them. I have watched young medical students enter residency finding a sense of discourse in the jarring move from classroom to practice, in turn facing conflict with nurse colleagues due to their lacking job skills. This steep learning curve has supported my belief that their knowledge and skills are created through human interaction and exposure to their actual job and not the current medical curriculum.

Epistemologically, my views align closely with a constructivist approach as I believe my own experiences, values, and background knowledge can have an influence on my assumptions and observations. However, to ensure objectivity in the research, I utilized a postpositivist approach as I had to first recognize and understand the effects of my own ontologically based biases and work to acknowledge and contain them as part of the process. Additionally, given this perspective, it was important to use mixed methods research to validate numeric findings with participants' own insights from their individual worldviews and experiences.

In understanding my biases, I was also led to look at my axiology or values that pushed me to want to explore this topic of research. I place enormous value on providing comprehensive education to physicians-in-training as an educator, recipient of care, and as part of my accountability to the general population that my trainees will one day treat. I believe there is a

significant need for GME to become more effective in meeting overall population health through job-related skill training. I can only do this by selecting the most appropriate research design that asks meaningful questions, utilizes relevant testing of variables, and offers new information to the profession that has been collected and interpreted with minimal bias.

**Purpose**

The purpose of this explanatory sequential mixed methods study was to evaluate the impact of a structured IPE program on its graduates' use of effective communication and collaborative behaviors postintervention as a preventative means to later career-related conflict between nurses and physicians.

Two exploratory pre-studies were conducted to review and analyze initial reactions to the intervention and immediate learning absorbed in relation to program objectives by reviewing pre/postsurveys (quantitative) and reflective journals (qualitative) from Cohort 1–3 participants at an academic healthcare center in South Texas. Both pre-studies were conducted using the framework of Kirkpatrick's (1994) Four-Level Training Evaluation Model to measure the impact of the programs' transfer of learning by determining a relationship between program learning objectives and skill application in practice.

Findings from the exploratory pre-studies helped inform the direction of the study's survey instrument selection of the ICCASr, which I used to measure perceived longitudinal communication skill development and determine current perceptions of the relationship between nurses and physicians-in-practice. The pre-studies also allowed for reflection on previous insights to drive the development of the current study's qualitative interview questions along with the responses to the ICCASr survey towards an explanatory outcome.

## Research Approach Rationale

There is a growing use of mixed method research in GME, yet preferred frameworks are still sparse. Using an "integrative methodology is consistent with the world-view of pragmatism" where the study, in this case, uses multiple methods of data collection focused on the social and community components of physician and nurse collaboration to answer various research questions rather than focusing on a single statistical process of data retrieval (Creswell, 2007, p. 40). Using a mixed methods approach can add breadth to medical education research by acknowledging "the importance of context," identifying both specific and general aspects of the topic, locating recurring patterns, offering variation insight, determining multifaceted outcomes using comprehensive numerical data aligned with real-life experience, and attaining "neutrality balanced by advocacy" (Greene, 2008, p. 19).

## Research Design

This explanatory sequential mixed methods study evaluated the impact of a structured IPE program on its graduates' use of effective communication and collaborative behaviors postintervention as a preventative means to later career-related conflict between nurses and physicians. The study employed a quasi-experimental approach for quantitative data and a thematic analysis for qualitative data.

## Theoretical Perspective

The current explanatory sequential mixed methods study intended to investigate the postintervention effects on shared communication and collaborative behaviors between early career pediatricians and pediatric nurses postintervention and longitudinally. The quantitative portion of the study was conceptually framed using the ICCASr instrument, which is based on the CIHC (2010) competency framework, based off the conceptual model of IPE. This tool

helped support the case that IPE programs allow for contact between nurses and physicians to take place to address misconceptions and create factual experiences between these two groups to begin authentic communication and lead to long-term skill building.

The qualitative portion of the current study used an open-ended question on the ICCASr survey once participants had entered practice to determine how they question their own assumptions, beliefs, and longitudinal experiences. Additionally, the survey asked for interest in interviewing from the participants. Interviews were conducted with all participants who volunteered. The qualitative section was emergent as the interview questions were developed based on the responses to the survey to elicit greater insight into the questions answered and the intervention's impact. The interviews also allowed for greater depth as each question was answered, leading to follow-up conversation. These qualitative components used a basic interpretive design methodology for data collection. This methodology allowed for exploration into the shared experiences of the program participants and helped identify and explain more specifically how the program created meaning using participant examples to reinforce and add depth to the numerical analyses.

The desire to connect post-positivism with constructivism in this study led to the approach of a pragmatic paradigm. The constructivist lens offers "an approach to learning that holds that people actively construct or make their own knowledge and that reality is determined by the experiences of the learner" (Elliott et al., 2000, p. 256). Pragmatism places an emphasis on shared meanings between learners or groups (Morgan, 2007). Creswell stated "theories can be both contextual and generalizable by analyzing them for transferability to another situation" (Creswell, 2007 p. 4). Arends (1998) stated that constructivism believes in the personal construction of meaning by the learner through experience, and that meaning is influenced by the

interaction of prior knowledge and new events. Taking this a step further, Morgan (2007) provided research to support how pragmatism "can connect induction with deduction, subjectivities and objectivity, context and generality and developed new terms of abduction, inter-subjectivity and transferability" (p. 71).

The intervention in the current study was built on the use of multiple theories beginning with Andragogy by Malcolm Knowles. As a core component of the intervention based in IPE competencies, there is a foundation that is reliant on participant experience. As noted in Knowles' theory, adults must be involved in the program's creation and goals, utilizing their own experience to include safety in expressing and making mistakes. Next, the curriculum should have immediate relevance and impact to their job or personal life. The activities should be problem-centered to allow the adult participants to work through the dilemma and create new meaning from the outcomes. The creation of the IPE educational program in this study relied on the following adult learning principles to include prior experience and relevance to today: (a) self-concept, (b) experience, (c) readiness to learn depends on need, (d) problem-centered focus, (e) internal motivation, and (f) adults must know why they need to know something (Merriam et al., 2007). Next, the student learning outcomes were developed using the IPEC competencies and layered using Benjamin Bloom's (1956) taxonomy. This means that the growth of knowledge relies on scaffolding information that is relevant and timely to the participant. Bloom's taxonomy is a system of hierarchical models (arranged in a rank, with some elements at the bottom and some at the top) used to categorize learning objectives into varying levels of complexity. Bloom's initial taxonomy was revised to reflect how learning is an active process and not a passive one. The learning process should move through phases, moving from acquiring new knowledge to creating meaning and new ideas from that knowledge.

In addition to program development utilizing adult learning theory and Bloom's taxonomy, there is the inclusion of the parameters of Allport's (1954) intergroup contact hypothesis and role theory (Science Direct, n.d.) in the relationship between physicians and nurses given that each profession has a place and corresponding role in the structure of healthcare and those roles have their own equal set of expectations and behaviors that have been socially determined but often lead to conflict. Allport stated in the intergroup contact hypothesis that "social contact between social groups is sufficient to reduce intergroup prejudice" (Nickerson, 2021). The IPE intervention included the discussion of predefined roles in healthcare, what those roles include for each person and how to update the expectations as needed, bases of issues between the nurse and doctor role as predetermined social roles without context into background, and bias that considers most everyday activity to be the acting-out of socially defined categories (e.g., mother, manager, teacher). Each role is a set of rights, duties, expectations, norms, and behaviors that a person must face and fulfill. Allport's contact theory provides insight into the current deficiency in lacking IPE education as human contact is not required but instead simulation is preferred. The contact hypothesis suggests that interpersonal contact between groups can reduce prejudice. According to Gordon Allport, who first proposed the theory, four conditions are necessary to reduce prejudice and allow teams to work towards equal status, common goals, cooperation, and institutional support. The current issue is that nurses and doctors do not learn together and only begin their relationship upon entering the clinical setting at different levels of preparedness in work skills. IPE education from the physician and nurse perspective should include contact hours to remove previous bias, create new perceptions to equal the roles, develop common goals (in this case relating to patient care), learn to work together to meet those goals, and have wide scale institutional support to continue

collaborative work. Finally, in support of andragogy and these stated learning theories is the foundational understanding of the zone of proximal development theory (Vygotsky, 1978). IPE education states it is reliant on interaction as part of the learning process; however, this type of learning can only be facilitated through guidance and support. The zone of proximal development theory describes the states at which a learner moves from potential to actual development, and heavily focuses on the importance of the social and in person interactions of facilitator and student to progress the learner. Therefore, if IPE education is to move the learner to actual development of skills, it must include real interactions in the real setting beyond that of workshops, didactics, and simulations.

All the above theories used to develop the IPE intervention and the means to assess said intervention support the blend of postpositivist, constructivist, and pragmatic paradigms in that meaning is personally constructed by the learner through experience, and that meaning is influenced by the interaction of prior knowledge, group interaction, and new events. It all begins with correct base information, an interaction between the roles, and an assessment of ability not knowledge. These learning theories have shared principles in that all persons have previous knowledge and the ability to learn new knowledge, knowledge is constructed not passively absorbed, knowledge is socially constructed, knowledge is personal, learning is an active process, and learning exists in the mind. Returning to the overarching constructivist (Dewey, 1938; Piaget, 1971) paradigm, the impact of the program under study was IPE focused first on assimilation, taking new information and including it into an existing schema. Then IPE looked at accommodation, using new information to update existing schemas or create new ones to construct new understandings and knowledge through experience and social discourse, and finally integrating new information with what they already know (prior knowledge). It has been

noted that adult learning is built from experience not textbooks and one's previous experiences can hinder or support higher level learning but always play a part in the learning model. Therefore, offering an intervention that identifies previous experience, builds on knowledge and skills, and provides a means for interaction among peers supported the paradigms utilized to assess the program itself and its impacts.

The combination of IPE framework assessment, constructivist and pragmatic paradigms, and mixed methods action focus allowed a deeper review of learners' perceived skill development in communication and collaboration and behavior changes to self and practice habits developed through formal learning and reflection on experience. The reason for using a mixed methods approach was to find greater clarity of the research problem and gauge change by complementing quantitative metrics using a vetted IPE-focused assessment with the participants' voices to identify major themes surrounding communication and collaboration via qualitative participant-driven data. This mixed methods study aimed to capture learning outcomes and offer relevant data on the effectiveness of a focused interprofessional program on longitudinal skill development of communication and collaboration in the nurse/physician team relationship dynamic.

**Participant Sampling**

Convenience sampling helped to select all the participants from the first three graduate cohorts, now in practice, to assess the postintervention impact on comparable scales. The sample is representative of the program and not the national population. This quantitative testing offered descriptive statistics, comparative analyses between participant roles, and correlation tests given that the sample size is not generalizable to the larger academic community. The qualitative data offered participant narratives to provide deeper insight into the program's impact. The physician-

in-training inclusion criteria for program participants was a mandatory educational component of their training. The nurse inclusion criteria were 3 or more years of service, active work in the inpatient hospital setting, a desire to participate, and approval from the nursing supervisor. Cohorts varied in size as incoming interns changed based on available funding and nurses based on interest and inclusion criteria. Cohort 1 was from 2014–2015 and had eight interns and six nurses, Cohort 2 was from 2015–2016 and had 13 interns and seven nurses, and Cohort 3 was from 2016–2017 and had 14 interns and five nurses. There was a possible total of 35 physicians and 18 nurse participants. The participants' age, gender, and race were variable due to reduced nurse sample pool availability and the inability to select physicians based solely on demographics.

**Setting/Site**

The data were collected at an academic health center in South Texas. The academic health center offers GME and training to over 850 residents and fellows representing over 80 specialties. The university partners with multiple clinical institutions and is committed to the training, education, and research development of the next generation of physicians. The pediatric residency program has been in existence since 1950 and has trained over 700 physicians. The main partnering hospital where most of the pediatric physicians complete their clinical work and are in collaboration with pediatric hospital nurses sits adjacent to the university. This study aimed to serve these sites and their healthcare teams. SurveyMonkey data systems collected responses to the quantitative research instrument (ICCASr). The interviews occurred via Zoom based on each participant's availability.

**Instrumentation**

The study utilized the ICCASr, designed by MacDonald (2010) and revised by Archibald (2014), to "assess the change in interprofessional collaboration-related competencies in healthcare students and practicing clinicians before and after IPE training interventions" (Archibald et al., 2014, p. 553). The ICCASr is a self-reported tool that looks to measure participants' skills across six areas: communication, roles and responsibilities, conflict management/resolution, team functioning, collaboration, and a collaborative patient-family centered approach using 20 questions. The ICCASr has a 21st question with no pre- and post-component to be answered on the postquestionnaire that asks, "Compared to the time before the learning activities, would you say your ability to collaborate interprofessionally is… (circle one)" and uses a reverse 5-point Likert scale (1 = much better now to 5 = much worse now). This question was run through descriptive statistics to show any possible change through overall score and mean average. The ICCASr is unique in that it used a retrospective pre-/post-approach, asking participants to complete the tool after the training had taken place from the perspective of both before and after the training. The participants were asked to rate their abilities on a 5-point Likert scale (poor to excellent). The first rating focused on their perceived abilities in the six domains as they recalled them prior to training, and then again as they recalled them once the training was done. All items within each factor were rated two times to evaluate perceptions before and after the learning activities, resulting in a total of 40 ratings. The results can allow intervention programs to evaluate their effectiveness as well as support participant self-reflection on how IPE training impacts interprofessional competencies.

## Instrument Reliability

### *Reliability Analysis*

The survey has been deemed reliable based on previous studies. I used Cronbach alpha coefficients to establish the reliability of the survey instruments' internal consistency on the current sample. The ICCASr was tested for reliability and scored a Cronbach alpha coefficient of .93, which met the minimum level for denoting instrument reliability as recommended by Nunnally (1978) with the mean interitem correlation falling within the Briggs and Cheek (as cited in Pallant, 2016) optimal value range of .2 to .4, as recommended.

### *Instrument Validity*

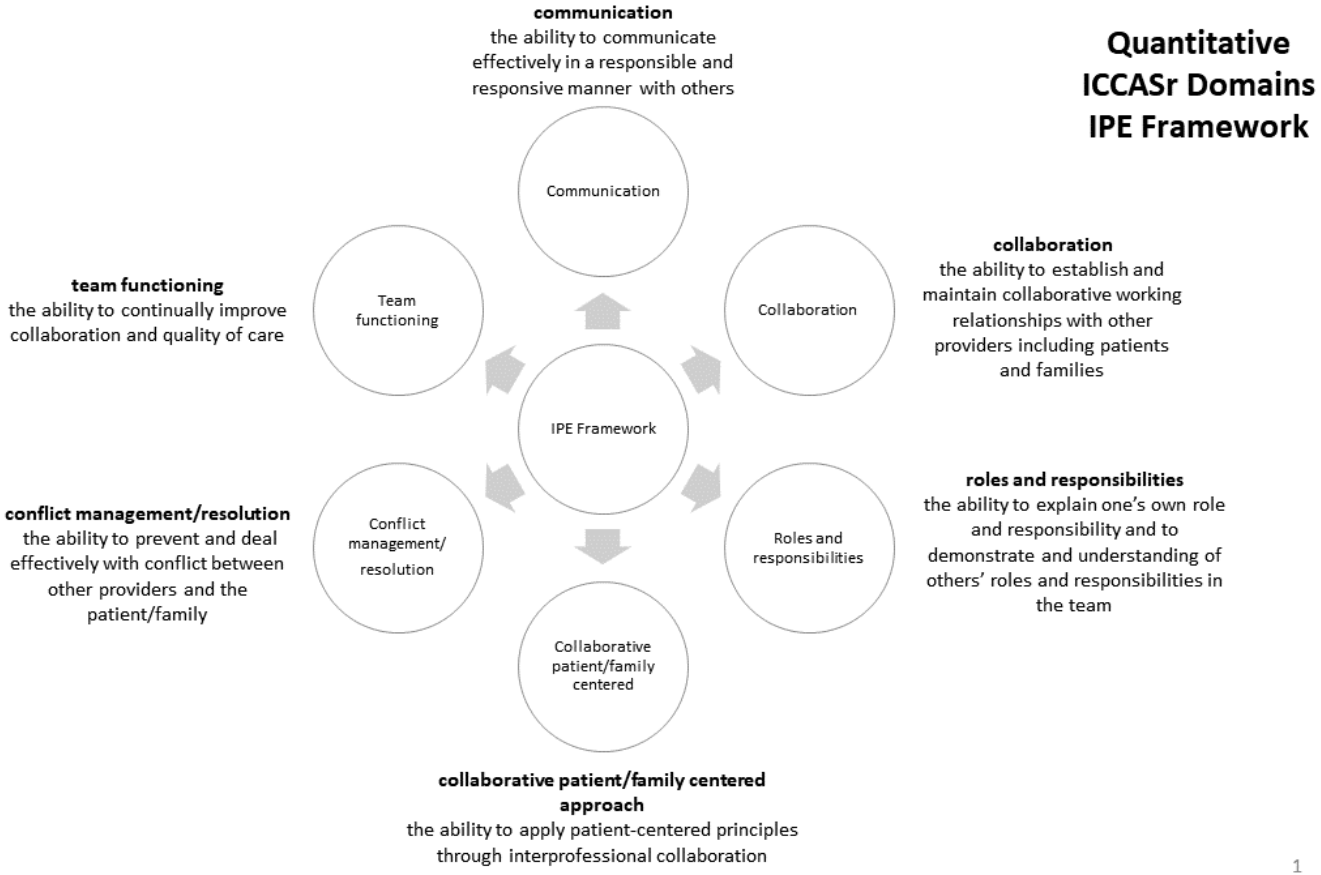
The survey known as the ICCASr was developed from established studies on IPE programs when interprofessional activities were introduced into healthcare curricula. Developed by MacDonald and colleagues in 2010, and further validated in 2014 and 2017, this retrospective pre and postattitudes survey evaluates student IPE activity perceptions (Archibald et al., 2014; Schmitz et al., 2017). Survey questions are grouped into the six categories that represent the interprofessional care competencies of the CIHC Competencies Framework, namely: communication, roles and responsibilities, collaboration, patient-centered approach, conflict management/resolution, and team functioning (see Figure 2). In terms of content validity, participants who were actively trained in areas measured by the ICCASr subsequently indicated improved ICCASr scores, demonstrating the interconnectedness among the constructs included both in training and the pre- and post-assessments (Schmitz et al., 2017). The ICCASr is an instrument developed to self-assess interprofessional collaborative behaviors based on established interprofessional collaboration competencies. The instrument's reliability and validity has been examined with participants from a variety of health profession programs with

evidence in support of using the instrument for measuring self-reported retrospective pre and post-IPE intervention competency attainment. The ICCASr consists of 20 items using a 5-point Likert-type scale (strongly disagree to strongly agree), with research suggesting that computing an average overall score for individuals is justifiable. Two validity studies revealed high internal consistency and a single explanatory factor underlying all six domains (Archibald et al., 2014; Schmitz et al., 2017). For the purposes of this study, to review perceptions on communication and collaboration postintervention, the ICCASr was deemed appropriate, valid, and applicable to the research questions needing further exploration (Archibald et al., 2014).

I also used a qualitative component in this study in addition to the ICCASr. The first section was an open-ended question added to the survey, asking, “How would you describe your communication and collaboration with your nurse/physician counterpart immediately following participation in the program?” and requesting “three examples of communication and collaboration skill application you’ve utilized with your nurse/physician counterparts in the last 12–36 months (this can be a story or situation example).” Next, the survey asked participants about their interest in interviewing, which resulted in eight interviews. Given that the qualitative section was emergent, the interview questions were developed based on the responses to the survey to assess the long-term impact of an intervention on visible changes highlighted through graduate experience and exposure. This qualitative section included the graduates’ self-reflections on the transfer of learning and the perceptions of skill application once in practice via example sharing. The qualitative position used narrative inquiry as a mechanism to highlight how learners create, validate, and reformulate the meaning of their experience once in practice.

**Figure 2**

*Quantitative ICCASr Domains IPE Framework*



The mixed methods focus is discussed as part of the dissemination of analyzed data to offer a deeper understanding of the overall topic. The assumption was that respondents would agree that participation in an early career program provided them knowledge, skills, and abilities to understand their role in an IPE team and effectively communicate with all team members once in practice.

## Research Questions

The initial assumption was that participants would agree, through self-reflected response, that involvement in an early career program provided them knowledge to understand their role on an IPE team, the ability to effectively communicate with all team members in practice, and the skills necessary to collaboratively provide the best patient care. The study aimed to answer the following questions.

### *Phase 1: Quantitative Questions—ICCASr Survey*

1. Is there a difference in the participants' perceived abilities across the six domains as they recall them on the ICCASr pre- and post-assessment? (quantitative)
2. Is there a difference between factor outcomes on the ICCASr pre/posttest between nurses' and physicians' professional roles? (quantitative)
3. Is there a correlation between posttest factors for each participant group (nurses and physicians)? (quantitative)

### *Phase 2: Qualitative Interview and Survey Questions*

1. Questions were developed to answer the "why" and "how" to the quantitative questions.

### *Phase 3: Mixed Methods Question*

The final phase used an alternative hypothesis in that using a mixed methods approach via the ICCASr survey, open-ended questions, and one-on-one interviews can provide a more

comprehensive understanding of how nurses and physicians describe their communication and collaboration with each other after participating in the program. (mixed methods question/hypothesis)

**Data Collection**

The ICCASr results were collected using Survey Monkey and only identified by role designation and graduation year and not by name. Completed survey data were saved to a secure University of Texas Network server and removed from Survey Monkey. The survey was only distributed in English using an electronic method sent to all participants. Participants had 2 weeks with two reminders within the period to complete the survey, although the length of time required to respond to all questions was less than 30 min. The survey was administered voluntarily. The interviews required a Zoom call that was recorded for transcription purposes. All data to include surveys, transcripts, video recordings, and interview memos were regularly backed up and protected using encrypted servers housed behind two-level passcode protection, requiring a password to enter the computer and a secondary password to enter the secure server.

**Data Conditions and Analyses**

A quasi-experimental design allows for multigroup comparison without manipulation to support the need to implement a targeted program. The use of a longitudinal postintervention assessment aimed to support the study's hypothesis. The 20 survey questions used a 5-point Likert scale ranging from poor (1) to excellent (5) and all data were entered by individual participants. The 21st survey question was collected posttest only and used a reverse 5-point Likert scale ranging from (1) much better now to (5) much worse now. Testing for all 21 questions offered descriptive statistics; however, only the initial 20 questions used comparative analyses between participant roles and correlation testing between domains. These initial

questions are generalizable to the local academic community but not applicable to the national community. Descriptive statistics included participants' professional role (nurse/doctor) and year of graduation to determine cohort characteristics. All quantitative analyses on the surveys utilized SPSS version 27 to run testing.

Paired samples t-tests were performed to evaluate differences in the participants' perceived abilities across the six domains/factors. Independent sample t-tests were performed to compare scores on group pre- and post-participation scores in the program and a correlation analysis was conducted to review the relationship between nurses' perceptions on the six domains. The questions located under each domain were combined into an overall total score to run testing on domains versus individual questions (example: all communication domain questions are a single factor) per my previous study recommendations. A Pearson correlation coefficient measured if there was a covariance between physicians' and nurses' roles and the product of their standard deviations.

The qualitative analyses focused on an interpretive design to locate significant categories from the position of the participants' own experiences as noted on the open-ended question. By way of a reflexive approach, responses can offer greater insight into self-reported observable experiences that participants deem meaningful without forcing responses into a predetermined code or theme (Braun & Clarke, 2013).

The qualitative analyses for the interview process focused on an interpretive design using a multilevel approach beginning with In Vivo coding to review language inside individual transcripts. Then I conducted conceptual coding, reviewing patterns of concepts to allow for labeling in the individual transcripts based on the participants' own experiences. Next, theoretical coding of combined transcripts with constant comparative analysis, such as reflexivity

journals, sampling, and memo writing, was conducted to locate significant themes from the position of the shared group's experiences (Chun Tie et al., 2019). Given that the qualitative section was emergent, the interview questions were developed based on the responses to the survey to elicit greater insight into both the survey and open-ended questions answered and the intervention's impact. Sampling was able to provide theoretical sufficiency.

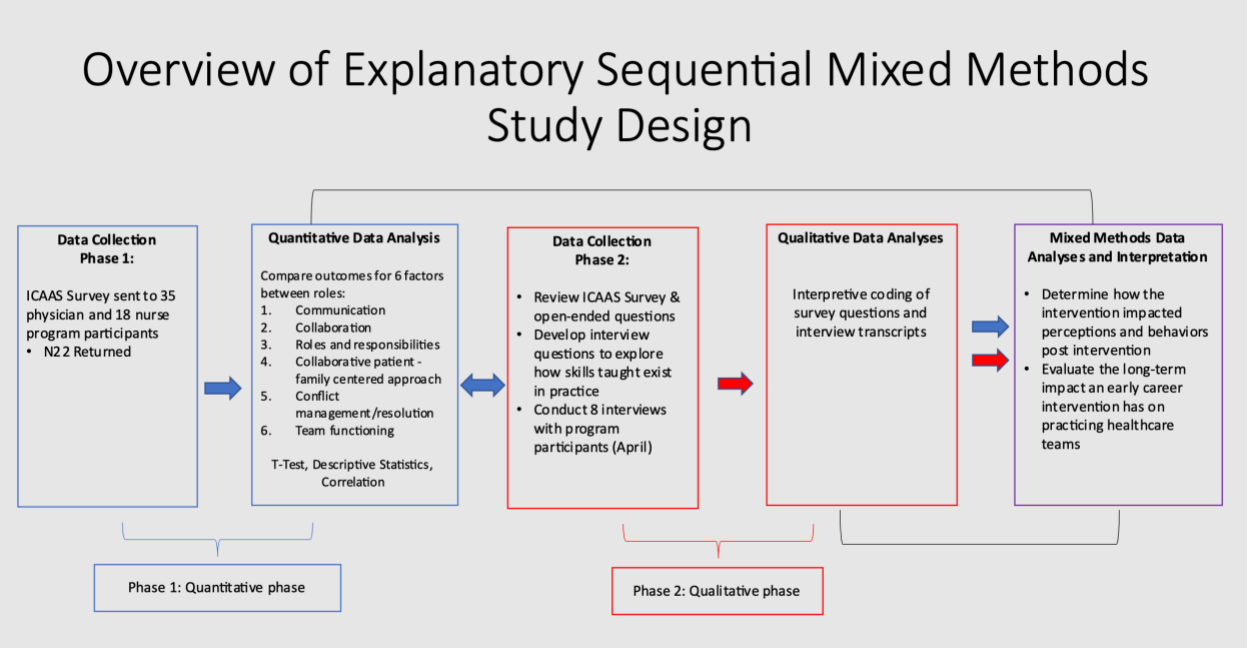
The use of an explanatory sequential mixed methods approach (see Figure 3) allowed for data analysis of the ICCASr survey, which reviewed participants' self-assessed interprofessional collaboration competency behaviors in a statistical format to be further investigated through a qualitative thematic analysis methodology driven from purposive sampling of self-selected participants through their lens of personal experiences. The use of mixed methods to highlight participants' responses can offer a more in-depth look at the individual experiences and shared community focus and provide a human connection to the statistical data.

**Ethical Consideration**

Participants were treated with the utmost ethical concern, beginning during the initial enrollment process, informing them of Institutional Review Board acceptance and protocols to ensure they understood the protections they were allowed as study participants. During the informed consent process, confidentiality processes, rights to explore and inquire about the research, voluntary enrollment and withdrawal, and all possible risks and benefits were clearly and transparently offered in written format. Participants could have withdrawn from the study at any time without retaliation, even if it meant their data could no longer be used in the analyses or final product. All data collection was confidential to protect privacy and ensure no retaliation for answers. All quotes are presented verbatim to avoid unintended bias resulting from context negotiation. Participants were invited to review the data before publication. Participants were

**Figure 3**

*Overview of Explanatory Sequential Mixed Methods Study Design*




*Note*. From *Research Design: Qualitative and quantitative and mixed approaches*, by J. W. Creswell, 2003. Sage.

made aware of the rationale behind and the timeline for the research, why medical education was selected for review, and the study's intended social impact using their expertise to drive the change. Participants were given an explanation of my history in the field, reasons for pursuing this data, and any power issues that may have arisen due to cultural or organizational structures. Finally, the reduction of the Hawthorne effect given the group's intimacy was noted, discussed, and actively reviewed to ensure testing effects were as minimal as possible.

**Limitations**

Limitations include a small sample size, with only 3 years of participants fitting the study's parameters, possibly affecting the use of data for larger generalization. Another limitation is the low response rate from graduates given that this population of professionals works excessive hours, which could have created a time limitation in responding to the survey.

The study's empirical nature is limited by measures used given practice environments are comprised of uncorrelated inputs. I also examined the impact of a specific set of learning objectives longitudinally; therefore, a limitation in memory correlation of learned skills could exist but will not be explored in this study. There is a possible negative limitation that the participants may have felt compelled to answer positively given their perceived power differential as well as their need to please me as their colleague. Finally, there is both a strength and a limitation as no other program of this type has been used in GME to compare.

# Chapter 4: Quantitative Results

The purpose of this explanatory sequential mixed methods study was to evaluate the impact of a structured IPE program on its graduates' use of effective communication and collaborative behaviors postintervention. As this was an explanatory sequential mixed methods study design, this chapter addresses the quantitative phase, in which the data analysis and interpretation were presented using descriptive and comparative analysis. Descriptive statistics were reported on the participants' demographic characteristics of their professional role and year in the IPE program. The ICCASr survey results were used to assess possible change to participants' perceptions of interprofessional-collaboration-related competencies in healthcare prior to and following an intervention. The data analysis was performed in the following order: survey return rate and data cleaning, reliability analysis, participants' demographic information, descriptive statistics, correlation statistics, and summary.

## Return Rate and Data Cleaning

The ICCASr survey, including the study's introduction and survey instructions, were sent to a total of 53 participants. The participants were all pediatric physicians and pediatric nurses who had graduated during the first 3 years of the PBP (IPE intervention) within an academic health center in South/Central Texas. Twenty-two respondents returned the surveys, for a return rate of 40% ($N = 53$). All 22 respondents answered the questions in their entirety.

Prior to conducting correlational analyses, the variables professional role and year in the IPE program were examined through various IBM SPSS programs for accuracy of data entry, missing values, and normality of the variable's distributions. These same variables were checked for normality and met the required assumptions for each test (see Tables 1 and 2).

**Table 1**

*Scale Reliability Pre and Posttest*

| Scale Individual Domain Pre/Posttest | Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | *N* |
|---|---|---|---|
| Communication | .825 | .834 | 10 |
| Collaboration | .829 | .832 | 6 |
| Roles and Responsibilities | .874 | .874 | 8 |
| Collaborative Patient-Family Centered Approach | .833 | .846 | 6 |
| Conflict Management/Resolution | .844 | .851 | 6 |
| Team Functioning | .759 | .763 | 4 |

**Table 2**

*Overall Cronbach's Alpha Value*

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | *N* |
|---|---|---|
| .928 | .931 | 12 |

### *Descriptive Statistics*

**ICCASr**. The ICCASr consists of 20 items using a 7-point Likert-type scale (strongly disagree to strongly agree). The demographic data reviewed were professional role and year in IPE program cohort. The results were based on nine nurse and 13 physician respondents. The cohorts were as follows: Cohort 1 had seven nurse and two physician respondents, Cohort 2 had one nurse and four physician respondents, and Cohort 3 had one nurse and seven physician respondents.

## Survey Results

### *Research Question 1*

Is there a difference in the participants' perceived abilities across the six domains as they recall them on the ICCASr pre- and post-assessment? This question was answered using paired samples t-tests performed to evaluate the difference in participants' perceived abilities in the six domains/factors as they recalled them on the ICCASr pre- and post-assessment (see Table 3).

**Table 3**

Paired Samples *T*-Test—*Nurse and Physician*

| | *M* | *N* | *SD* |
|---|---|---|---|
| Postcommunication | 4.05 | 22 | .527 |
| Precommunication | 2.90 | 22 | .616 |
| Postcollaboration | 4.15 | 22 | .597 |
| Precollaboration | 2.94 | 22 | .846 |
| Postroles and Responsibilities | 4.07 | 22 | .557 |
| Preroles and Responsibilities | 2.85 | 22 | .778 |
| Postcollaborative patient-family centered approach | 4.06 | 22 | .521 |
| Precollaborative patient-family centered approach | 2.88 | 22 | .717 |
| Postconflict Management/Resolution | 4.09 | 22 | .593 |
| Preconflict Management/Resolution | 3.06 | 22 | .767 |
| Postteam Functioning | 4.05 | 22 | .532 |
| Preteam Functioning | 2.75 | 22 | .736 |

### Communication

A paired-samples *t*-test was conducted to evaluate the difference in participants' perceived abilities in communication as they recalled them on the ICCASr pre- and post-assessment. In reviewing by factor, there was a statistically significant increase in ICCASr scores

from pretest factor communication (*M* = 2.9, *SD* = .62) to posttest factor communication (*M* = 4.0, *SD* .53), *t* (21) = 7.97, *p* < .001 (two-tailed). The mean increase in communication scores was 1.15 with a 95% confidence interval ranging from .85 to 1.4. The eta squared statistic (.76) indicated a large effect size using Cohen's d criteria.

**Collaboration**

A paired-samples *t*-test was conducted to evaluate the difference in participants' perceived abilities in collaboration as they recalled them on the ICCASr pre- and post-assessment. In reviewing by factor, there was a statistically significant increase in ICCASr scores from pretest factor collaboration (*M* = 2.9, *SD* .84) to posttest factor collaboration (*M* = 4.2, *SD* .59), *t* (21) = 6.35, *p* < .001 (two-tailed). The mean increase in collaboration scores was 1.21 with a 95% confidence interval ranging from .82 to 1.6. The eta squared statistic (.67) indicated a large effect size using Cohen's d criteria.

**Roles and Responsibilities**

A paired-samples *t*-test was conducted to evaluate the difference in participants' perceived abilities in their roles and responsibilities as they recalled them on the ICCASr pre- and post-assessment. In reviewing by factor, there was a statistically significant increase in ICCASr scores from pretest factor roles and responsibilities (*M* = 2.9, *SD* .77) to posttest factor roles and responsibilities (*M* = 4.1, *SD* .56), *t* (21) = 7.00, *p* < .001 (two-tailed). The mean increase in roles and responsibilities scores was 1.23 with a 95% confidence interval ranging from .86 to 1.6. The eta squared statistic (.71) indicated a large effect size using Cohen's d criteria.

**Collaborative Patient/Family Centered Approach**

A paired-samples *t*-test was conducted to evaluate the difference in participants' perceived abilities in their collaborative patient and family centered approach as they recalled them on the ICCASr pre and post-assessment. In reviewing by factor, there was a statistically significant increase in ICCASr scores from pretest factor collaborative patient/family centered approach ($M$ = 2.9, $SD$ .72) to posttest factor collaborative patient/family centered approach ($M$ = 4.1, $SD$ .52), $t$ (21) = 8.05, $p$ < .001 (two-tailed). The mean increase in collaborative patient/family centered approach scores was 1.12 with a 95% confidence interval ranging from .88 to 1.5. The eta squared statistic (.76) indicated a large effect size using Cohen's d criteria.

**Conflict Management/Resolution**

A paired-samples *t*-test was conducted to evaluate the difference in participants' perceived abilities in conflict management and resolution as they recalled them on the ICCASr pre- and post-assessment. In reviewing by factor, there was a statistically significant increase in ICCASr scores from pretest factor conflict management/resolution ($M$ = 3.1, $SD$ .77) to posttest factor conflict management/resolution ($M$ = 4.1, $SD$ .59), $t$ (21) = 5.97, $p$ <.001 (two-tailed). The mean increase in conflict management/resolution scores was 1.03 with a 95% confidence interval ranging from .67 to 1.4. The eta squared statistic (.64) indicated a large effect size using Cohen's d criteria.

**Team Functioning**

A paired-samples *t*-test was conducted to evaluate the difference in participants' perceived abilities in team functioning as they recalled them on the ICCASr pre- and post-assessment. In reviewing by factor, there was a statistically significant increase in ICCASr scores

from pretest factor team functioning ($M$ = 2.8, $SD$ .74) to posttest factor team functioning ($M$ = 4.0, $SD$ .53), $t$ (21) = 7.77, $p$ < .001 (two-tailed). The mean increase in team functioning scores was 1.29 with a 95% confidence interval ranging from .95 to 1.6. The eta squared statistic (.75) indicated a large effect size using Cohen's d criteria.

**Summary**

The first research question asked if there was a difference in participants' perceived abilities across the six domains as they recalled them on the ICCASr pre- and post-assessment. Six paired samples t-tests were conducted to answer this question. Results showed that there were statistically significant differences with a large effect increase in scores between pre and posttests. Based on the results, there was a significant increase in scores reported after participation in the program in the participants' perspectives surrounding their skills in all six areas: communication, roles and responsibilities, conflict management/resolution, team functioning, collaboration, and collaborative patient-family centered approach.

**Research Question 2**

For Research Question 2, independent sample t-tests were performed to compare group pre and postparticipation scores in the program (see Table 4). The question asked, "Is there a difference between factor outcomes on the ICCASr pre/posttest between nurses' and physicians' professional roles?"

**Communication**

An independent samples t-test was conducted to compare the communication scores for nurses and physicians prior to the intervention. There was no significant difference in scores for nurses ($M$ = 2.9, $SD$ = .81) and physicians ($M$ = 2.9, $SD$ = 4.7; $t$ (20) = .07, $p$ = .95, two-tailed).

The magnitude of the difference in the means was as follows: mean difference = .02, 95% CI: -.55 to .6.

**Table 4**

*Independent Sample* T-*Tests—Pretest*

| | Role | *N* | *M* | *SD* |
|---|---|---|---|---|
| Communication | Nurse | 9 | 2.91 | .813 |
| | Physician | 13 | 2.89 | .473 |
| Collaboration | Nurse | 9 | 3.33 | .882 |
| | Physician | 13 | 2.67 | .733 |
| Roles and Responsibilities | Nurse | 9 | 3.06 | .737 |
| | Physician | 13 | 2.71 | .803 |
| Collaborative Patient-Family Centered Approach | Nurse | 9 | 3.11 | .726 |
| | Physician | 13 | 2.72 | .692 |
| Conflict Management/Resolution | Nurse | 9 | 3.19 | .959 |
| | Physician | 13 | 2.97 | .630 |
| Team Functioning | Nurse | 9 | 2.83 | .901 |
| | Physician | 13 | 2.69 | .630 |

**Collaboration**

An independent samples t-test was conducted to compare the collaboration scores for nurses and physicians prior to the intervention. There was no significant difference in scores between nurses ($M$ = 3.3, SD = .88) and physicians ($M$ = 2.7, $SD$ = .73; $t$ (20) = 1.9, $p$ = .07, two-tailed). The magnitude of the difference in the means was as follows: mean difference = .67, 95% CI: -.05 to 1.39.

**Roles and Responsibilities**

An independent samples *t*-test was conducted to compare the roles and responsibilities scores for nurses and physicians prior to the intervention. There was no significant difference in

scores between nurses (*M* = 3.1, *SD* = .74) and physicians (*M* = 2.7, *SD* = .80; *t* (18.3) = 1.0, *p* = .31, two-tailed). The magnitude of the difference in the means was as follows: mean difference = .34, 95% CI: -.35 to 1.04.

**Collaborative Patient/Family Centered Approach**

An independent samples *t*-test was conducted to compare the collaborative patient/ family centered approach scores for nurses and physicians prior to the intervention. There was no significant difference in scores between nurses (*M* = 3.1, *SD* = .73) and physicians (*M* = 2.7, *SD* = .69; *t* (16.8) = 1.3, *p* = .22, two-tailed). The magnitude of the difference in the means was as follows: mean difference = .39, 95% CI: -.26 to 1.05.

**Conflict Management/Resolution**

An independent samples *t*-test was conducted to compare the conflict management/resolution scores for nurses and physicians prior to the intervention. There was no significant difference in scores for nurses (*M* = 3.2, *SD* = .96) and physicians (*M* = 2.9, *SD* = .63; *t* (20) = 6.2, *p* = .54, two-tailed). The magnitude of the difference in the means was as follows: mean difference = .21, 95% CI: -.49 to .92.

**Team Functioning**

An independent samples *t*-test was conducted to compare the team functioning scores for nurses and physicians prior to the intervention. There was no significant difference in scores for nurses (*M* = 2.8, *SD* = .90) and physicians (*M* = 2.7, *SD* = .63; *t* (20) = .43, *p* = .67, two-tailed). The magnitude of the difference in the means was as follows: mean difference = .14, 95% CI: -.54 to .82.

**Summary**

For Research Question 2, there was no significant difference between factor outcomes on the ICCASr pretest between nurses' and physicians' professional roles after performing an independent sample t-tests to compare scores on the group in the program (see Table 5).

**Table 5**

*Independent Sample* T-*Tests—Posttest*

| | Role | *N* | *M* | *SD* |
|---|---|---|---|---|
| Communication | Nurse | 9 | 4.20 | .548 |
| | Physician | 13 | 3.94 | .506 |
| Collaboration | Nurse | 9 | 4.33 | .553 |
| | Physician | 13 | 4.03 | .616 |
| Roles and Responsibilities | Nurse | 9 | 4.22 | .618 |
| | Physician | 13 | 3.96 | .509 |
| Collaborative Patient-Family Centered Approach | Nurse | 9 | 4.22 | .471 |
| | Physician | 13 | 3.95 | .542 |
| Conflict Management/Resolution | Nurse | 9 | 4.26 | .494 |
| | Physician | 13 | 3.97 | .645 |
| Team Functioning | Nurse | 9 | 4.28 | .441 |
| | Physician | 13 | 3.88 | .546 |

**Communication**

An independent samples *t*-test was conducted to compare the communication scores for nurses and physicians after the intervention. There was no significant difference in scores between nurses ($M = 4.2$, $SD = .55$) and physicians ($M = 3.9$, $SD = .51$; $t\ (20) = 1.15$, $p = .26$, two-tailed). The magnitude of the difference in the means (mean difference = .26, 95% CI: -.21 to .74) was moderate (eta squared = .06)

**Collaboration**

An independent samples *t*-test was conducted to compare the collaboration scores for nurses and physicians after the intervention. There was no significant difference in scores between nurses ($M$ = 4.3, $SD$ = .55) and physicians ($M$ = 4.0, $SD$ = .62; $t$ (20) = 1.2, $p$ = .24, two-tailed). The magnitude of the difference in the means (mean difference = .31, 95% CI: -.23 to .84) was moderate (eta squared = .07)

**Roles and Responsibilities**

An independent samples *t*-test was conducted to compare the roles and responsibilities scores for nurses and physicians after the intervention. There was no significant difference in scores between nurses ($M$ = 4.2, $SD$ = .62) and physicians ($M$ = 3.9, $SD$ = .51; $t$ (20) = 1.08, $p$ = .29, two-tailed). The magnitude of the difference in the means (mean difference = .26, 95% CI: -.24 to .76) was moderate (eta squared = .06)

**Collaborative Patient/Family Centered Approach**

An independent samples *t*-test was conducted to compare the collaborative patient/family centered approach scores for nurses and physicians after the intervention. There was no significant difference in scores between nurses ($M$ = 4.2, $SD$ = .47) and physicians ($M$ = 3.9, $SD$ = .54; $t$ (18.8) = 1.3, $p$ = .22, two-tailed). The magnitude of the difference in the means (mean difference = .27, 95% CI: -.18 to .73) was moderate (eta squared = .07)

**Conflict Management/Resolution**

An independent samples *t*-test was conducted to compare the conflict management/resolution scores for nurses and physicians after the intervention. There was no significant difference in scores between nurses ($M$ = 4.3, $SD$ = .49) and physicians ($M$ = 3.9, $SD$

= .65; *t* (19.72) = 1.17, *p* = .26, two-tailed). The magnitude of the difference in the means (mean difference = .29, 95% CI: -.22 to .79) was moderate (eta squared = .002)

**Team Functioning**

An independent samples *t*-test was conducted to compare the team functioning scores for nurses and physicians after the intervention. There was no significant difference in scores between nurses (*M* = 4.3, *SD* = .44) and physicians (*M* = 3.8, *SD* = .55; *t* (20) = 1.79, *p* = .08, two-tailed). The magnitude of the difference in the means (mean difference = .39, 95% CI: -.07 to .85) was large (eta squared = .14)

**Summary**

For Research Question 2, there was no significant difference between factor outcomes on the ICCASr posttest between nurses' and physicians' professional roles after performing an independent sample t-tests to compare scores on the group in the program.

**Pre- and Post-test Summary**

The second research question asked if there was a difference between factor outcomes on the ICCASr pre/posttest between nurses' and physicians' roles. To answer this question, an independent samples *t*-test was conducted to compare each domain score for nurses and physicians prior to and immediately following the intervention. Results showed that there was no significant difference in scores for nurses and physicians based on role. However, the magnitude of the difference in the means ranged from moderate to large depending on the domain being assessed. Based on the results, this indicates that any change that occurred during the program was effective for both nurses and physicians at similar rates.

## Correlation Statistics

### *Research Question 3*

A correlation analysis was conducted to answer the research subquestion, "Is there a correlation between posttest factors for each participant group (nurses and physicians)?" The relationship between nurses' perceptions on the six domains (as measured by the ICCASr) was investigated using a Pearson product-moment correlation coefficient. The relationship between physicians' perceptions on the six domains (as measured by the ICCASr) was investigated using a Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure there was no violation of the assumption of normality, linearity, and homoscedasticity. Table 6 presents the nurses' correlation results.

### Summary of Nurse Correlations

The relationship between nurses' perceptions on the six domains were predominantly shown to have significantly strong positive correlations except for three paired variables as shown below.

- There was a strong, positive correlation between perceived roles and responsibilities associated and with high levels of perceived collaboration, $r = .98$, $n = 9$, $p < .01$.
- There was a strong, positive correlation between perceived team functioning associated with high levels of perceived conflict management/resolution, $r = .87$, $n = 9$, $p < .01$.
- There was a strong, positive correlation between perceived team functioning associated with high levels of perceived collaborative patient-family centered approach, $r = .87$, $n = 9$, $p < .01$.
- There was a strong, positive correlation between perceived communication associated with high levels of perceived collaboration, $r = .83$, $n = 9$, $p < .01$.

- There was a strong, positive correlation between perceived team function associated with high levels of perceived roles and responsibilities, $r = .78$, $n = 9$, $p < .005$.
- There was a strong, positive correlation between perceived communication associated with high levels of perceived roles and responsibilities, $r = .78$, $n = 9$, $p < .005$.
- There was a strong, positive correlation between perceived team function associated with high levels of perceived collaboration, $r = .77$, $n = 9$, $p < .005$.
- There was a strong, positive correlation between perceived conflict management/resolution associated with high levels of perceived collaboration, $r = .71$, $n = 9$, $p < .005$.
- There was a strong, positive correlation between perceived communication associated with high levels of perceived conflict management and resolution, $r = .71$, $n = 9$, $p < .005$.
- There was a strong, positive correlation between perceived collaborative patient-family centered approach associated with high levels of perceived collaboration, $r = .69$, $n = 9$, $p < .005$.
- There was a strong, positive correlation between perceived conflict management/resolution associated with high levels of perceived roles and responsibilities, $r = .68$, $n = 9$, $p < .005$.
- There was a strong, positive correlation between perceived collaborative patient-family centered approach associated with high levels of perceived roles and responsibilities, $r = .67$, $n = 9$, $p < .005$.
- There was no significant correlation between perceived collaborative patient-family centered approach associated with conflict management/resolution, $r = .62$, $n = 9$, $p = .077$.

- There was no significant correlation between perceived collaborative patient-family centered approach associated with communication, $r = .62$, $n = 9$, $p = .19$.
- There was no significant correlation between perceived team functioning associated with communication, $r = .57$, $n = 9$, $p = .11$.

Table 7 presents the physicians' correlation results.

**Summary of Physician Correlations**

There was a strong, positive correlation between all six variables with high levels of perceived associations between each domain of communication, collaboration, roles and responsibilities, collaborative patient-family centered approach, conflict management/resolution, and team functioning from both roles.

**Summary**

The purpose of this explanatory sequential mixed methods study was to evaluate the impact of a structured IPE program on its graduates' use of effective communication and collaborative behaviors postintervention. This chapter provided descriptive, inferential, and correlation data analyses based on ICCASr data. Descriptive statistics were reported on the participants' demographic characteristics of their professional role and year in the IPE program. The ICCASr survey results were used to assess possible change in participants' perceptions of interprofessional-collaboration-related competencies in healthcare prior to and following an intervention. To further analyze the data obtained from the ICCASr paired t-tests, independent t-tests and correlational statistics were calculated to understand the differences among the roles in terms of nurses' or physicians' perceptions in connection with the six designated domains: communication, roles and responsibilities, conflict management/resolution, team functioning, collaboration, and collaborative patient-family centered approach.

In addition to the 20 pre- and post-questions, the survey creators included a 21st question on the post-survey only. The summative question asked, “Compared to the time before the learning activities, would you say your ability to collaborate interprofessionally is…” and asked the participant to circle the response that best represented their current abilities based on a 5-point Likert scale (1 = Much better now, 2 = Somewhat better now, 3 = About the same, 4 = Somewhat worse now, 5 = Much worse now). As shown in Table 8, both groups of participants reported “better” interprofessional collaboration post-interprofessional programming. These summative data are reflective of the positive outcomes found in the statistical analyses performed for Research Questions 1 and 2.

**Table 6**

*Correlation—Nurse*

| | | Communication | Collaboration | Roles and Responsibilities | Collaborative Patient-Family Centered Approach | Conflict Management/ Resolution | Team Functioning |
|---|---|---|---|---|---|---|---|
| Communication | Pearson Correlation | 1 | .826** | .775* | .484 | .709* | .569 |
| | Sig. (2-tailed) | | .006 | .014 | .187 | .033 | .110 |
| | *N* | 9 | 9 | 9 | 9 | 9 | 9 |
| Collaboration | Pearson Correlation | .826** | 1 | .976** | .693* | .712* | .769* |
| | Sig. (2-tailed) | .006 | | <.001 | .039 | .031 | .015 |
| | *N* | 9 | 9 | 9 | 9 | 9 | 9 |
| Roles and Responsibilities | Pearson Correlation | .775* | .976** | 1 | .667* | .675* | .777* |
| | Sig. (2-tailed) | .014 | <.001 | | .050 | .046 | .014 |
| | *N* | 9 | 9 | 9 | 9 | 9 | 9 |
| Collaborative Patient-Family Centered Approach | Pearson Correlation | .484 | .693* | .667* | 1 | .617 | .869** |
| | Sig. (2-tailed) | .187 | .039 | .050 | | .077 | .002 |
| | *N* | 9 | 9 | 9 | 9 | 9 | 9 |
| Conflict Management/ Resolution | Pearson Correlation | .709* | .712* | .675* | .617 | 1 | .872** |
| | Sig. (2-tailed) | .033 | .031 | .046 | .077 | | .002 |
| | N | 9 | 9 | 9 | 9 | 9 | 9 |
| Team Functioning | Pearson Correlation | .569 | .769* | .777* | .869** | .872** | 1 |
| | Sig. (2-tailed) | .110 | .015 | .014 | .002 | .002 | |
| | *N* | 9 | 9 | 9 | 9 | 9 | 9 |

*Note*. **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed). a. Role = Nurse.

**Table 7**

*Correlation—Physician*

| | | Communication | Collaboration | Roles and Responsibilities | Collaborative Patient-Family Centered Approach | Conflict Management/ Resolution | Team Functioning |
|---|---|---|---|---|---|---|---|
| Communication | Pearson Correlation | 1 | .804** | .751** | .741** | .687** | .654** |
| | Sig. (2-tailed) | | <.001 | <.001 | <.001 | <.001 | <.001 |
| | *N* | 22 | 22 | 22 | 22 | 22 | 22 |
| Collaboration | Pearson Correlation | .804** | 1 | .909** | .870** | .871** | .875** |
| | Sig. (2-tailed) | <.001 | | <.001 | <.001 | <.001 | <.001 |
| | *N* | 22 | 22 | 22 | 22 | 22 | 22 |
| Roles and Responsibilities | Pearson Correlation | .751** | .909** | 1 | .737** | .737** | .811** |
| | Sig. (2-tailed) | <.001 | <.001 | | <.001 | <.001 | <.001 |
| | *N* | 22 | 22 | 22 | 22 | 22 | 22 |
| Collaborative Patient-Family Centered Approach | Pearson Correlation | .741** | .870** | .737** | 1 | .787** | .848** |
| | Sig. (2-tailed) | <.001 | <.001 | <.001 | | <.001 | <.001 |
| | *N* | 22 | 22 | 22 | 22 | 22 | 22 |
| Conflict Management/Resolution | Pearson Correlation | .687** | .871** | .737** | .787** | 1 | .942** |
| | Sig. (2-tailed) | <.001 | <.001 | <.001 | <.001 | | <.001 |
| | *N* | 22 | 22 | 22 | 22 | 22 | 22 |
| Team Functioning | Pearson Correlation | .654** | .875** | .811** | .848** | .942** | 1 |
| | Sig. (2-tailed) | <.001 | <.001 | <.001 | <.001 | <.001 | |
| | *N* | 22 | 22 | 22 | 22 | 22 | 22 |

*Note*. **. Correlation is significant at the 0.01 level (2-tailed).

**Table 8**

*ICCAS Question 21—Summative Data*

| Role | *M* | *N* | *SD* |
|---|---|---|---|
| Nurse | 1.56 | 9 | .726 |
| Physician | 1.85 | 13 | .689 |
| Total | 1.73 | 22 | .703 |

The results of the descriptive statistics and comparative and correlation analyses supported the focused interview questions that were used during the qualitative phase of this study.

# Chapter 5: Qualitative Results

The purpose of this explanatory sequential mixed methods study was to evaluate the impact of a structured IPE program on its graduates' perceived use of effective communication and collaborative behaviors postintervention. Additionally, the desire to understand how participation in an early intervention program personally impacted communication skills and nurse–physician collaborative relationships once in practice to provide better patient care was an outcome of the study.

As this was an explanatory sequential mixed methods study design, this chapter addresses the qualitative phase, in which the data analysis focused on an interpretive design using multilevel descriptive, holistic, and In Vivo coding to locate significant themes from the position of the participants' own experiences as noted on the open-ended survey and interview questions. During the quantitative phase, the ICCASr survey was administered and included in the survey were two open-ended questions with a response rate of $N = 22$. The survey responses revealed a language pattern that was not sufficient alone for analysis but instead provided a guide to the qualitative review.

This chapter includes the interviewed participants' demographic characteristics, a description of the interview procedures, and an outline of common themes and categories. Categories by greater than half of the participants aided in the development of both themes and categories. The sequence of data analysis was as follows: participants' demographic information, thematic analysis categorized by overall themes, and a chapter summary.

## Demographics

A total of eight interviews were conducted between April 1, 2022, and April 7, 2022. All interviews took place on Zoom and were between 45 to 90 min in length. Interview questions are

in Appendix D. The initial question posed during the interview phase was as follows: “Can you tell me about yourself and your current practice environment, such as who is on your team?” This question was asked to generate demographic information as well as a self-described current healthcare team structure.

Table 9 shows each participant’s cohort, role and designated identifier, degree, type of clinical practice, gender, years of practice, and if they were working in interprofessional teams at the time of the intervention. In addition to these demographics, the nurse participants had 5 to 20 years of nursing experience upon entering their cohort of the intervention program, whereas all physician participants were resident interns. At the point of the interviews, the nurse participants all worked in hospital floor units (acute, inpatient, and critical care), whereas the physician participants worked in either hospital-based inpatient care, the critical care unit, or general pediatrics outpatient care. The intervention utilized inpatient nurses due to the ability to recruit and time allowability by nurse location. Clinic-based nursing staff work a more traditional schedule of Monday through Friday, 8:00 a.m. to 5:00 p.m., whereas inpatient nurses work a 12-hr shift schedule with days off in between, which supported easier participation in after-hours activities.

**Table 9**

*Interview Participants' Demographics*

| Cohort | Role and "Name" | Degree | Practice | Gender | Years in practice | IP Team Members |
|---|---|---|---|---|---|---|
| 2014–2015 - Cohort 1 | PhysicianKB | DO | PICU | Female | Intern – 1st year | Yes |
| 2014–2015 - Cohort 1 | NurseAS | RN | Inpatient | Female | 5 years | Yes |
| 2014–2015 - Cohort 1 | NurseLR | RN | Sedation | Female | 20 years | Yes |
| 2014–2015 - Cohort 1 | NurseLB | RN, CNRN, CCRN | PICU | Female | 20 years | Yes |
| 2015–2016 - Cohort 2 | PhysicianPD | DO | General Pediatrics/Palliative Care | Female | Intern – 1st year | Yes |
| 2015–2016 - Cohort 2 | PhysicianCA | DO | General Pediatrics/Rural | Female | Intern – 1st year | Yes |
| 2015–2016 - Cohort 2 | PhysicianHG | DO | Hospitalist | Female | Intern – 1st year | Yes |
| 2016–2017 - Cohort 3 | PhysicianRH | MD, MPH | Hospitalist/Sedation | Female | Intern – 1st year | Yes |

*Note*. DO = Doctor of Osteopathic Medicine; RN = Registered Nurse; CNRN = Certified Neuroscience Registered Nurse; CCRN = Critical Care Registered Nurse; MD = Doctor of Medicine; MPH = Master of Public Health.

Once demographic data were collected, a series of semi-structured open-ended questions were presented to each participant, with many responses allowing for probing questions that varied by participant. The series of questions and answers were recorded during each participant's interview via Zoom. Throughout the recorded interviews, clarification was requested of the participants' responses as needed. Following the interviews, I transcribed the audio verbatim into a Word document. The full transcript, along with the recording, was sent to the participants to allow any corrections of their responses to the questions to be made to ensure their stories were set in the correct context. The interview period for each participant ranged

from 45 to 90 min, with a total interview time of 7 hr and 35 min. A total of 143 pages were transcribed with the individualized participant manuscripts ranging from 10 to 27 pages.

**Thematic Analysis**

The essential themes discovered in this study emerged from an analysis of the data gathered from the participants' responses to each of the interview questions and their survey based open-ended question responses. Review, reflection, and triangulation on themes was the approach used to provide a pathway for insight into the spirit of the participants' experiences in an early intervention program and how participation in an early intervention program impacted communication skills and perceptions of nurse–physician collaborative relationships once in practice.

Each interview was recorded via Zoom and transcribed verbatim into Word documents to facilitate the analysis process through a systematic methodology of organizing, analyzing, and interpreting the data. Upon completing each transcription, the transcript was read in conjunction with listening to the audio and watching the interview expressions through video recording to ensure accuracy. A typed copy of the transcript was sent to each interviewee for their review and feedback. By including the participant in the active review of their own story, each interviewee was afforded an opportunity to read their transcript and review for accuracy, offer corrections, and/or revise any statements, to include additions, deletions, or any other changes they felt fully represented what they wanted to convey. Transcripts were edited in accordance with their feedback, and in turn updated transcripts were resent to the interviewees. Final-version transcripts were reread multiple times to allow for exploration of the data.

Yin's (2011) five-phased cycle was utilized to build an analytical framework for data organization, directing data mining, data sorting, data interpretation, and memo writing. By

concurrently performing data collection and analysis, exploration into preliminary searches of general themes allowed for interview questions to be reframed, in turn provoking richer discussions with the interviewees regarding their perceptions and allowing for more detailed descriptions of their experiences to be shared. The process of interviewing allowed for the transcripts to be read repeatedly, allowing patterns to emerge. Patterns were then color coded, bolded, or underlined depending on their context within each individual transcript. This visual representation allowed for the next step of organizing conceptual and contextual patterns. Yin's steps of "disassembling and reassembling data" created the need to assign labels, or "codes," to the patterned fragments (pp. 190–191).

Given the mixed methods design, it was necessary to utilize induction and deduction in parrel, which led me to utilize multiple methods of discovery to ensure I reviewed the interview and survey data from multiple lenses. Without the requirement to develop a new theory, I used the first three phases of Saldaña's (2015) streamlined codes-to-theory model for initial coding and then Miles et al.'s (2020) iterative qualitative data analysis model for higher level data integration.

Saldaña's (2015) coding strategy was used as the guide for the formal coding process. During the first cycle, In Vivo coding was completed on the individual transcripts to locate recurring words/language that were either color coded, bolded, or underlined. Next, conceptional coding was done in the first cycle on individual transcripts to locate patterns of concepts through paragraph review to allow for word tracking, concept recognition, and emerging categories. Finally, after the first cycle, thematic coding was conducted where all individually coded transcripts were combined for review to locate common codes (words/concepts) from all sources. During the sorting process, the first cycle coding allowed me to locate two or more categories,

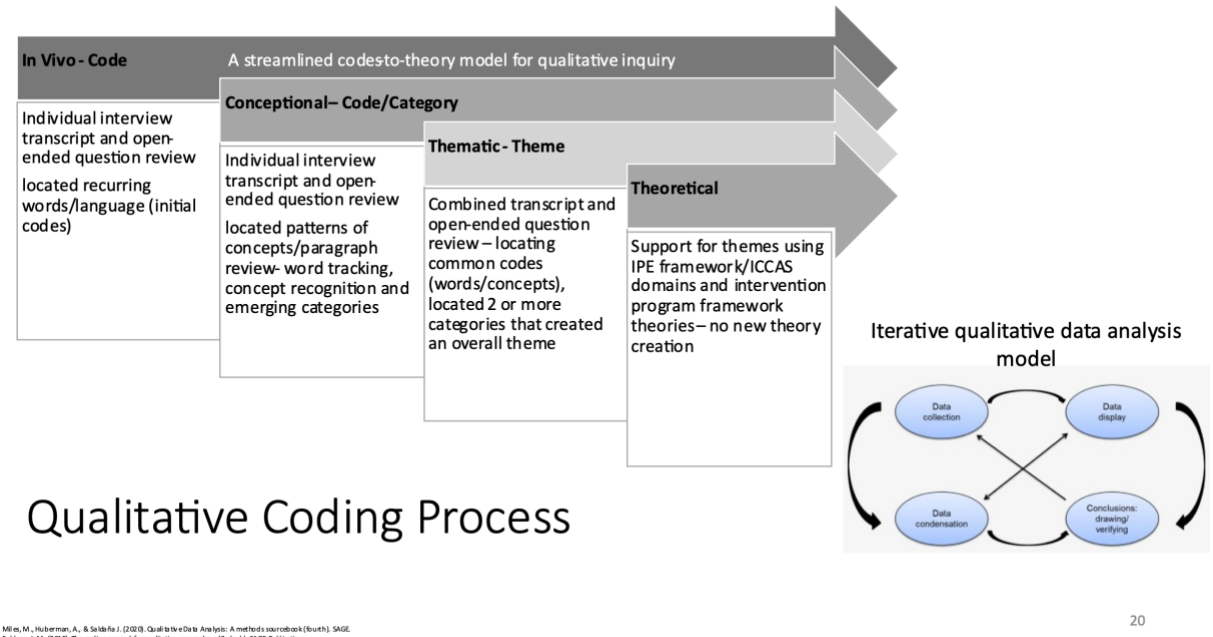
which created an overall theme with categories based on the relationship between the codes, code frequencies, and underlying or shared meanings across codes. Saldaña noted that “a theme is an extended phrase or sentence that identifies what a unit of data is about and/or what it means" (2015, p. 199). This was interpreted to mean that the units of data found in phrasing and sentence structure identify meaning but may not necessarily become the unit of data in and of itself. Given that this was a mixed methods design partially using a quantitative tool, ICCASr domains were differentiated but kept in place for the holistic and additional support of category creation but also to support this concept of data units and meaning creation. Following open coding and sorting data, the next steps were to synthesize the data as a key point in moving to the second cycle of coding.

During the second phase of coding, the first step was taking the open-coded data through the axial coding process of relating categories and concepts via inductive and deductive thinking to locate core themes. Next, selective coding or a constant comparison of data was undertaken to ultimately stop working through open-coding data and begin delineating only those variables that relate to the core variable in sufficiently significant ways to produce higher level framework support. The final stage of the second cycle of coding was theoretical coding, identifying through guided IPE theory, a relational model where all codes/categories are related to the core category. This final step provided support for identified themes and categories using guided theory/frameworks. Saldaña (2015) said “a theme is an outcome of coding, categorization, and analytic reflection, not something that is, in itself, coded” (p. 198). Each theme was based on the participants’ descriptions of their perceptions based on their experiences as related to the intervention and their previous life experiences and not just a process stemming from matching words or sentences.

After the data went through Yin (2011) and Saldaña's (2015) coding strategies and there was an initial understanding of the context, scope, and key categories, an iterative data analysis coding technique was utilized to support a formal organization of data structure and to reveal and notate any additional associations within and between concepts and experiences described in the data (see Figure 4). This process aided in the analysis process as it allowed for catalogued key categories to be reviewed multiple times prior to confirming essential themes to ensure "key concepts were preserving the context in which these concepts occurred as a means of validation" (Miles & Huberman, 1994, p. 245-262).

**Figure 4**

*Qualitative Coding Process*




*Note*. From Qualitative data analysis: A methods sourcebook (fourth). SAGE. Miles, M., Huberman, A., & Saldaña J., 2020.

The study revealed the following four essential thematic interpretations: foundational deficits, construction of perspectives, development of relationship, and organizational influence.

Each essential thematic interpretation was influenced through the discovery of coding and categorizing data obtained from the participants' interviews. The categories of formal education, intra-educational divide, and informal education/clinical training influenced the essential theme of foundational deficits. The three categories of life experience, relationship to medicine, and work experience influenced the essential theme of construction of perspectives. The three categories of intentional contact/interaction, relationship building, and safe space influenced the essential theme of development of relationship. The three categories of role definition/hierarchy, hospital system processes, and culture of leadership support influenced the essential theme of organizational influence.

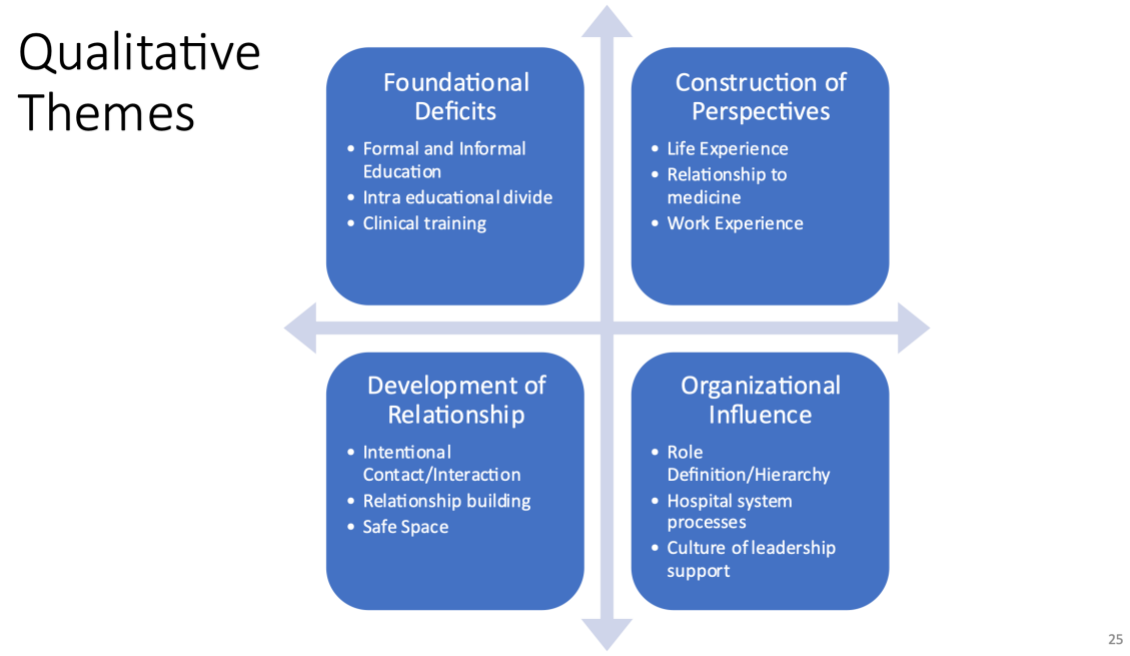
To support the thematic statements, I utilized narrative interpretation and extended direct participant quotes. Any quotation that appears in this study is derived from participants' interviews and is transcribed exactly as it appears in the transcript. There was no attempt to remove language or correct grammar to ensure each participant's narrative was their own and the insights into their experience were not manipulated.

**Findings**

This study discovered a richness of data based on open-ended question responses, video and transcribed Zoom interviews, and researcher memoing. I analyzed the qualitative data and four essential themes supported by 12 categories emerged (see Figure 5). The following section offers my analyses of the interview narratives in response to the stated questions. The rest of the chapter describes essential themes and categories based on the participants' views, voices, and interpretations utilizing participants' quotations as to how participation in an early intervention program impacted communication skills and perceptions of nurse–physician collaborative relationships once in practice.

**Figure 5**

*Qualitative Themes*




**Essential Theme: Foundational Deficits**

The interview question, "Can you offer insight into a specific component of the PBP that provided you skills to enter the workforce as a member of the IPE team you did not learn in formal education?" was asked in relation to the gaps found through the literature review noting a lack of IPE during medical and nursing school. During the interview process, the conversation surrounding deficits found in formal education were spoken to and about as an important reason for ineffective communication and the inability to collaborate among nurses and physicians once in practice. The participants did not offer any studies or references for their perceptions; instead, their own experiences on the healthcare team, personal observations, and individual opinions were the foundation of their responses. The three categories, formal education, intra-educational divide, and informal education/clinical training formed the essential theme foundational deficits

when exploring the participants' reflections on how participation in an early intervention program impacted their communication skills and collaborative relationships.

***Category Formal Education***

The participants consistently described that medical school provides theoretical information on diagnosis and disease management but not job-related skills to provide clinical care, whereas nursing school provides both theory and practice models but no soft skills on role definition, team membership, or communication. In some regards, the nurse participants felt they were taught to follow physicians' orders but not to collaborate with their physician colleagues in providing patient care. Neither participant role was provided any sort of interprofessional training, on-the-job training, or detailed insights into their day-to-day jobs but instead were expected to have all the necessary knowledge, skills, and attitudes to successfully provide team-based care upon their graduation from formal education. Additionally, both roles received some clinical training during the formal years; the physicians have 2 mandated years of clinical rotations driven primarily by observation in medical school and the nurses are required to gain a specific number of clinical hours in various settings dependent on their specific nursing program. In these required clinical hours, there was a widespread void of role modeling of effective team-based communication and collaboration due to the brief period on the rotations. This gap in job skills was made more obvious throughout their time in the intervention program as they began to learn the necessary IPE skills to execute team-based care and was one of the main reflection pieces that impacted their abilities the most as they began to see the gaps in their own required education in relation to their work expectations.

PhysicianRH explained how she believed the intervention provided a way to fill these medical school gaps in interprofessional training from her own experience:

> The buddy program helped us see how we all work as a team, whereas, in medical school, I know there's a lot of observing in medical school and so you feel like you're outside of that. It's already difficult to be integrated into this doctor team, let alone into the interdisciplinary team with a nurse. I think in training in the buddy program, it was a lot more about how to collaborate and not just coexist.

NurseLB stated "I wasn't taught any of these skills in nursing school. They discussed the concept of multidisciplinary care, but no one ever says what that means. It's a buzzword people like to use" when referring to not being taught about team collaboration or communication at varying levels while in nursing school. Every participant noted they faced the same gaps in formal education and that it took this intervention to gain necessary interprofessional training.

When posed the question, "Can you offer insight into a specific component of the PBP that provided you skills to enter the workforce as a member of the IPE team you did not learn in formal education?" the responses revealed that the lacking information in medical and nursing school set a deficit in the professional world. These deficits also hindered participants' abilities to communicate, collaborate, and understand roles and responsibilities. PhysicianKB said,

> The problem with medical school and medical training is they don't generally prepare future physicians for the teamwork aspect, the communication, and the leadership aspect that it takes to be good physician because you are the leader of the team, you have a whole team around you taking care of whatever patients that you have.

PhysicianKB noted that she felt as though she had to immediately be the "leader" upon entering the clinical floor for the first time, but it did not take long to understand that she was not alone. There was a team of providers all working toward the health of the same patient with whom she was unprepared to communicate effectively or even understand their role in the care team due to lacking knowledge coming from medical school. PhysicianRH shared a similar sentiment when asked the same question with a probing question of "did you work in teams in medical school?" PhysicianRH stated,

> Not very well. I was quite independent in medical school. We had our anatomy group. Well, in our medical school, we were the first year with a new curriculum that tried to do a little bit more team-based learning. We had our team-based weekly groups, but they were all medical students. We'd take weekly quizzes together. In that sense, they did push you more towards learning how to work in a group to answer the questions. Then we had our groups go over cases or certain aspects of medicine as a group together. It's a little bit more like debriefing as opposed to working towards a common goal.

In this scenario, PhysicianRH was still only working with her medical student colleagues and not working through cases with other professions such as nursing. I asked about the "new curriculum" she discussed as it seemed it had a team-based component but was informed the curriculum was implemented to have medical students work in small groups instead of completely solo, as had been done for decades prior, but there was still no focus on IPE or the inclusion of other healthcare professions.

PhysicianPD described the impact from the intervention for her was

> The biggest thing is communication. I know that part of the goal was to help foster that ability to communicate, because when you're in medical school, there's a lot of information coming at you, but you're not necessarily giving that information back out. You may or may not depending on your medical school and your program and your clinicals had a good experience presenting or giving information back and how to give the most important information or how to shift that information as needed.

This also spoke to the structure of medical school being that of mass amounts of information or theory being learned and hopefully absorbed but not a lot of critical thinking required to determine the needs of the information and how it may apply in practice. NurseLB also agreed on this sentiment. They felt "[the buddy program] really did help solidify the fact that we are supposed to be a team and the best-case scenario that multidisciplinary team, how important it is, and how important our own individual roles are" as she also did not learn these team-based skills in her nursing education. In some ways, NurseLB felt as though her role was to support the physicians when coming out of school and quickly learned that her role was as important for the tasks and care of the patient. NurseLB noted that the program solidified the

team's necessity but also offered a window into the fact that her physician colleagues were also underprepared, which leveled the playing field. NurseLR offered her experience when looking at her education and how it failed to prepare her decades ago and how it had improved but still lacked training in communication when she returned a decade later:

> So, my education initially did not really, um, have much education on communication with physician. It was more of a, you know, the physicians write the orders, you carry them out. And it was just a very traditional and plus it was in the early 90s. So, it was a more traditional doctor-nurse relationship. When I went back in 2015 and went through the bachelor's program, there was a lot more education directed at communication with not just the physicians but the team as a whole in the working as a team, communicating with other nurses, with, you know, other dieticians, physical therapists, all the other members of the team. So, there was more education specific to that, but I don't feel like a lot of content on that even in 2015.

This reflection shows that there have been small improvements in the formal educational structure, but it was still a deficit in teaching required IPE skills as late as 7 years ago.

***Category Intra-Educational Divide***

Intra-educational divide was defined as the animosity felt between same and differing roles on the healthcare team based on the perception that one type of degree or education was better than another, leading to professional identity divides. This perceived feeling of inferiority was mentioned throughout the interviews when referencing collaboration between roles. The doctor vs. nurse divide kept a level of hierarchy that was sustained at all levels of the work experience but began during the beginning years of each person's career. The participants spoke to the lack of specific role support seen in formal and informal education between faculty vs. resident, new nurse vs. seasoned nurse, and specialties of medicine.

Many of the comments regarding the divide between specialties of medicine were made passively without a blatant call out of another field, but still it was alluded to that certain

specialties treat their nurses and physician colleagues poorly. When exploring the surgical specialties, PhysicianRH noted that

> what I've noticed a lot of, like the negative side, is a lot of being dismissive of the nurses' concerns, whether it's from a surgical service who doesn't want to come check on the patient, just think of the nurses overreacting, or utilize the nurse in a way that is inappropriate. They're like, "Oh, can you just tell the family, whatever." Like passing messages through the nurse instead of just coming to see the patient themselves. I've seen that on the negative side, like communicating with the nurse, yes, but putting them in an awkward position where they don't understand the full plan. They didn't do the surgery.

This statement looking at the surgical fields to nurses or even primary care physicians was supported by other participants but has also been spoken to in the literature. It is often discussed that the surgical services believe themselves to be superior because of their residency training, feeling as though they are more important to the care team given their technical skills over the diagnostic acumen of their hospitalist partners. Additionally, it was noted that surgical services use nurses as their personal assistants in family communications, follow-up planning, and what is referred to as "scut work" in the hospital setting.

PhysicianCA explored this concept as she detailed her medical school experience. She explained that she was required to rotate through multiple specialties, allowing her to see the variation in behavior and treatment of the team and then eventually landing in a pediatric residency:

> in medical school you get exposed to so many different rotations. Whereas for us, we were just in the pediatric world, and I think pediatric world had it the nicest, you know. In terms of like people being good to each other and treating each other kindly, whereas other subsets or other rotations, I think [this training] would kill that full belief of like what we have to be better, have to be inferior because then you're dealing with surgeon mentalities. You're dealing with internal medicine, hospitalist, adult, whatever other subspecialty you can think of.

Here PhysicianKB speaks to the kindness of pediatrics but also how she believes this program could possibly change the perspectives of other fields.

In moving to the physician to nurse divide, PhysicianHG explained she had experiences with nurses as a young adult when working a summer job as an aid in a hospital:

> In different ways, I felt more comfortable with the nurses because that's pretty much what I knew. Although as I went through medical school, you feel a little bit more what your role is within the team. You start to divide that out.

She spoke to learning that in medical school she was taught her role was to be "in charge" and was not taught the role of a nurse or how they work on the team. She felt as though medical school created the initial divide of who was in charge regardless of the situation at hand, which she found to be part of the overall problem beginning so early in their careers.

PhysicianPD offered an outside glimpse into her observations of the intra-divide between nurses from her time in training and now in practice by stating,

> Oh, wow so in the nursing profession, and this is just something I've seen from the outside is that the older more seasoned nurses are often pretty rough on those brand-new nurses. It's like, I've been there you're going to go through it too. You got to do just as much. It's got to be just as hard for you or you're not going to be as strong as I'm going to be.

This concept of others needing to suffer the same hardships to make them stronger or more successful was seen here between new and seasoned nurses but also experienced by the physicians-in-training and their faculty counterparts. Over the course of 20 years, the training environment for physicians has moved from the wild west of minimal oversight and regulation to lessened autonomy with required supervision, confined duty hours, increased charting, and competency-based assessments. These changes were implemented with little to no guidance from the experienced faculty as to how to make the cultural change, leading to resentment and a feeling that the new generation does not understand how to do their jobs because "they've had it easy." Physician KB noted the educational difference:

> Nurses somehow sometimes have more of a difficult relationship, I feel like, which I think is interesting. My theory at least is that a lot of them are NPs, so they are nurses, and so they're more critical of the nurses, because they are nurses, because they're like,

> Well, I would do it. They can do it, and so they can do both roles. I've seen that conflict a little bit.

Here she referred to the levels of nurses from registered nurses to nurse practitioners and how they interact with one another. NurseLB continued that discussion of both the divide between nurse levels and the feeling of suffering through an example of her colleague returning to school to gain a graduate degree after years of hard work, leadership, and program development only to find that degrees had become more important than experience:

> She [a fellow nurse] had entered into the pediatric education track at UT in Austin and quit it because she said that she was surrounded by nurses in their 20s that literally had no practice at the bedside whatsoever that never intended a working bedside. They just wanted to go straight into that leadership, educational role with no background. Then here she is, she actually wrote the grant to get all the equipment for our current PALS Program at the hospital. She helped design it. She's the one who developed the entire program. She was just an associate degree nurse. When she went to bridge to her masters to do that, and she's in this classroom with people that have never taught anyone anything, and she's just like, "No," it didn't compute. The things that they were having her do, it was so far backwards from where she was in her lifespan as an educator of nurses. She was just like, "It's just not worth it." She quit the program.

NurseLB went on to explain that this is similar when nurses see new interns arrive on the floor without any experience and are immediately the boss, in turn casting doubt on the team that has been working for years.

NurseAS discussed that concept of role divide based on culture by saying,

> I feel like, um, there's a breakdown somewhere. Um, there's obviously a culture that's been created between the nurses where there's a lack of respect for the doctors, but why? You know, it's, I think people are generally good. They want to have great working relationships, um, something happened somewhere where the nurses feel like they can't trust the doctors, or they're not respected. So, it goes both ways.

This statement alone provided the basis for most of this category that many of the participants were aware of the intra-educational divide and role conflict but could not determine where it stemmed from, why it continued, or how to stop it other than to participate in this type

of intervention to move the needle on change by offering insights into the person and their experience.

***Category Informal Education/Clinical Training***

One of the more prevalent categories found was the focus on the clinical training environment as it lacks unit role modeling/mentorship. Additionally, both roles are provided with some clinical training during the formal years, but the physicians have a mandated clinical residency following medical school and the nurses do not. Interview Question 2 was designed as a follow up to the open-ended survey question to provide greater depth into the specific topic on how the program directly impacted role definition. The interview question was, "Can you offer an insight into a specific component of the PBP that offered you greater insight into your role on the healthcare team?" The participants spoke at length as to their initial inability to work together effectively with their counterpart simply because they lacked the understanding of what the other role does, which creates a lack of mutual respect for role. The deficit in understanding the others' role in the process, management, or execution of care for the patient led the participants to fill in their own knowledge gap by assuming the other, especially the nurse role, was established to support the needs of the physician in all patient care and not as an independent and necessary part of the decision-making process and ultimate outcome on patient care. In reverse, the nurse participants were under the assumption that physicians complete medical school with all the knowledge, skills, and attitudes necessary to execute their own duties as well as understand others' participation in the process and were surprised to discover that physicians-in-training lack basic soft skills and job training even in residency.

PhysicianKB spoke to the experience of working on the quality improvement project as a specific component of the PBP that offered her greater insight into all roles and noted that

working with her team and others was pivotal to her understanding the perspectives of the other. She noted,

> Not only my experience, but knowing the experiences of others, I think [redacted name] who had an outpatient experience, just knowing her relationship with some of the outpatient nurses was so much stronger than my relationship with them just by simply doing that project together. You notice who did projects with who and in what area. That's the hard part about being a trainee is that you're in so many different areas. You're just being moved around all the time, and so it's hard to really facilitate those kinds of relationships quickly over the course of one month or a couple of months a year. I think this helps at least in one area you're going to know someone better and that person is hopefully going to have told their colleagues about you. It just provides a little bit more friendly environment in at least one area just walking in straight off the bat. That's really helpful. Just knowing the relationship that I formed and the relationships that I still form between other residents and nursing staff and whatnot. I just felt like it was unique and really added a lot to the experience of training.

PhysicianKB worked through the project, discussed projects with her co-interns, and realized that the relationships they were all building allowed her—through quick rotation turnover—to have a foundation on each unit where she knew her role, understood the role of the nurse, and could fundamentally bring them together based on her learned skills in the program.

PhysicianHG spoke to one of the interactive didactics offered in the program where teams go through a day-in-the-life exercise using the same case/patient to see who does what on the team to execute care. This exercise fostered multiple discussion points and PhysicianHG offered a reflective point where she noted,

> Gaining a better understanding of what their job entails, allows you to have a better respect for what they do. I always tell them every day, whenever they're all like, "Oh, how many days are you on?" I'm like, "Oh, I'm on for seven." They're like, "Oh, my God." I'm like, "Yes, but you guys are on your feet for 12 hours. Some days, yes, I do have that we're on call at night, but you guys are nonstop doing with the families and you're on your feet before." I was like, you gain a different respect for what they're doing. That's important because it's not just like, "Oh, they work two shifts a week." No, it's really hard.

Through this activity, PhysicianHG was able to see what the roles were throughout the exercise and gain respect for the hours worked even if they differed from her own. This insight was important to her in gaining new respect for her nurse colleagues.

NurseLR spoke to the Top 10 Things activity where each role sits in a group and notes the top 10 things they wished the other role knew on Day 1 of residency. This activity was spoken about by all the participants as impactful for "seeing the other" differently. NurseLR stated,

> So, um, looking at them as more of a human, you know, rather than this is their job, they're supposed to do this. They're the one who's gonna call the shots, you know, to see they had time constraints, they had personal issues going on. They were overwhelmed. They had a lot of lack of knowledge of what nurses do. So, I look at them, I think in a more holistic approach than I did before the Buddy Program.

NurseLR described this in relation to her beginning to see them beyond their title but instead as a person, in that she could also see their role, her role, and how she could approach this interaction differently moving forward. Finally, PhysicianKB highlighted the essential theme foundational deficits with her final analogy:

> I think part of being a good leader is understanding all of the roles very well. You have to understand the roles of your entire team to be able to be the leader. The coach of a football team understands the role of every single player on their field, but physicians are expected to run a team without truly understanding the education and role of every single person that they're working with. I don't think leadership, communication, management, those concepts aren't really explored [in medical school and training], in my opinion, very well.

This comprehensive statement was shared by all participants in seeing their formal education deficits, recognizing the intra-educational divide in their culture, and addressing the informal education/clinical training that was void of developing leadership ability. Each of these areas were improved upon during the intervention as the participants filled their educational

gaps, in turn adjusting their mentality by learning the others' role and its professional identity on the team and how to communicate with effectiveness and compassion.

**Essential Theme: Construction of Perspectives**

Another overarching and repetitive impact of the early intervention program participants spoke of was the construction of their own perspectives of the other, which can either support or be a barrier to communication and collaborative relationships in practice. As noted, the ICCASr survey offered open-ended questions. The first question was, **"**How would you describe your communication and collaboration with your nurse/physician counterpart immediately following participation in the program?" Several of the responses were single words or short phrases such as improved, effective, more fluid and open, easier, more friendly, excellent, or "we stayed in touch for several years after and we remained close friends and supportive." However, others offered full sentences that were more in-depth as highlighted below. Given that the survey was anonymous, there are no identifiers for role or name but instead direct quotes from the question itself. These survey responses were used to create interview questions to explore direct observations for interview participants. The quotes stand alone as insights into how the program impacted communication and collaboration immediately following the intervention and how those impacts support the themes found throughout the interview process via trust, perspective change, and relationship building, which all work to improve communication and ease collaborative efforts.

> Through the program, we developed a great rapport and were better able to work together to meet patient care goals.
>
> Opened up dialogue faster and with more concise questions/concerns
>
> Learning the nursing or other interprofessional team members' perspective is imperative to culture change and improving patient care

> I was able to see their perspective much better and understood them. I felt comfortable and we trusted each other much more.
>
> Easier and more affective. I realize now they are just as nervous sometimes and need support instead of judgement.
>
> Communication with my physician counterpart improved dramatically. I feel that the Buddy Program allowed the physicians to see the nurses as part of the care team by taking our professional opinions into account when producing a care plan. The physicians also improved in keeping nursing updated on any changes or upcoming procedures either in person or by phone, rather than relying on the EMR to notify us of those changes. By doing this, we are able to effectively improve communication by asking for clarification or bringing up any other issues that the physician may not have been aware of.
>
> I feel that I was able to approach nurses as colleagues, eliminating preconceived notions of hierarchy that has been established in medicine. We have conversations as equals, valuing each other's perspectives on care plans/issues
>
> As a senior nurse (20yrs+) who has been "training" new residents for a long time, being a part of the buddy program made me see things from a new Pedi residents' perspective. It endeared and educated me on their struggles and learning curve within the hospital system. As a result, I feel I have a better understanding and respect for their educational needs and professional challenges as they grow.
>
> A familiarity with the staff improved communication and I believe opened a more comfortable channel of communication then previously established

Interview Question 3 followed up on this survey-based open-ended question to provide greater depth into the specific topic of how the program directly impacted communication and collaboration. The question was as follows:

> The survey asked you to offer three examples of how your communication and collaboration with nurses/physicians was improved by participation in the program once in practice. Can you elaborate on why you believe the PBP specifically impacted your ability to communicate and collaborate with your nurse/physician counterparts?

This essential theme was based on the participants' life experiences, relationships to medicine prior to entering the profession, and individual work experiences, all noted as areas of significant individual reflection and ultimate change in paradigms.

PhysicianPD was the only intern who had a full professional life and career prior to entering medicine. She spoke about her experiences in the program as to why she believed the intervention was able to impact communication and collaboration:

> I spent 20 years in education before I went to medical school. I was 10 years as a teacher, 10 years as a professional developer, teaching the other teachers how to teach assessments and such. I started medical school at 43 and then ended up in pediatric residency. In that respect, I have a different perspective than some in understanding adult education, adult learning, and adult learning styles and such. I could truly appreciate the buddy program for that, in that you have to feel safe in growing relationships.

Under the theme of constructing perspectives, it was important that the participants could look at their previous experiences and apply them to the current program to grow new perspectives and behaviors. NurseLB spoke to her experiences in seeing the intern role differently after the program because

> In the real world, I realized that you just finished an academic program in medical school and that-- you know what I mean? It was all academics, but it never translated to the fact of they don't know how an actual ICU flows or how the floor flows or when we pass meds, when we do what we do, all the minutia of your shift.

This new perspective created a greater level of patience from NurseLB and allowed her to communicate at the intern level and understand that collaborating would mean she would need to teach them how to function in the clinical flow and processes as they did not have those skills upon arrival.

***Category Life Experience***

Life experience was defined by how a person grew up and what they experienced in their lives prior to medicine, which plays a role in a person's personality development and ultimately their aptitude for effective communication. This was described in the interview throughout the questions as participants reflected on their own experiences and how they related to the program. Many participants noted that some people have a natural ability to communicate, whereas others

may require training to effectively provide their needs to the receiver. PhysicianKB explained that

> if you're inherently good at communicating, which I can talk to a tree if I need to. That's fine for me and I'm happy to talk to people, but if that's not in your personality, there was no coaching or training [in school or practice] to encourage that or to provide insight or to provide any help with that. I think that's where a lot of miscommunication happens, which can cause patient safety issues.

This reinforces the lack of proper instruction for those persons with underdeveloped communication skills to be effective in practice during any portion of their training and often once in practice by organizations or hospitals. This also shows the impact of the program that was focused on preparing all people to communicate effectively, starting with their comfort level and moving each person to the point of effectiveness.

PhysicianPD noted, "Having that different perspective, that different life prior to medicine helped me more than hindered me in a lot of ways because I felt very comfortable speaking to people, I felt comfortable triaging problems." This previous work experience foundation is not commonly seen in new trainees; therefore, this supports the notion that prior experience in the work world allows for an easier transition into the complex world of medicine as it provides a level of skill and comfort that is transferrable to practice care. Many interns enter residency with a decade of formal education, volunteer experience gained for strength in their admission applications, and little to no work experience.

PhysicianHG spoke to her previous experience with nurses and how that exposure created fewer barriers in the sense of communication once she became an intern:

> When I was trying to figure out how to get my foot in the door of medicine, I was volunteering at a hospital downtown, and the only people who really took the time and made me genuinely feel like I could do this and wanted to teach me were the nurses. That has always held a huge place in my heart. I'm actually still friends with the nurses back when I was like 18 and 19. I still see them. I was really, really pumped. Like I said, that's why I remember it so fondly, because I have my own meaningful history with nurses.

Having this prior experience allowed PhysicianHG to enter practice with the confidence that some of her peers did not have given their lack of exposure to medicine and healthcare team structures. The interesting aspect is her exposure to nursing also provided her with insight into the role prior to her entering medical school.

PhysicianKB went a little further in exploring her past and current experiences:

> I think there's some ageism and some sexism in there. I'm just going to throw that out there as well. Just knowing, being a young female attending in a male-dominated place, it still exists even towards me, as far as just inappropriate, rude communication, but I think training does have something to do with it.

She explored these cultural barriers that are found even with the best communicators who require previous experience to handle them with greater grace than those who are experiencing them for the first time. She noted that "training" plays a part; her context was residency training and watching others receive role modeling that supports the perpetual gender and age divide instead of dismantling it.

***Category Relationship to Medicine***

The participants' relationships to medicine prior to entering the healthcare profession provided a foundation to their perceived abilities or inabilities to collaborate in a healthcare model. The varied exposure to nurses and doctors, hospitals, and patient care all offer differences in understanding how things should work and how each participant shows mutual respect. Several participants are first-generation medical providers and many have siblings or parents who have served in the opposite role of themselves such as a doctor's mom is a nurse with a firsthand look at high- and low-functioning nurse/doctor teams. PhysicianHG said the following about the program:

> I think for a lot of people it meant a lot, but for me, it meant a ton. Especially because before I got to medical school and residency when I don't come from a medical background in my family and neither of my parents went to college. I was the first person

> in my family to get a higher degree in my whole extended family everywhere, on both sides.

The program allowed for training in the areas of communication and collaboration in a field and culture PhysicianHG had not experienced previously. Many of her colleagues were legacy physicians who had some understanding of the workload, stress, and expectations that she did not have. This program allowed her to find her own skills in how to best work with her nursing counterparts instead of having a trickle-down effect from being a legacy.

PhysicianKB had a different experience. She said,

> That [her communication ability] has to do with how I grew up, since my mom was a nurse married to my physician father. I think I grew up in a dynamic that appreciated those roles as well, but I think experiences like the Buddy Program remove a lot of negative thoughts and conversations sometimes rolling around the hospital and bring it back to the positive by teaching each of us to maybe give some grace, they're going through a stressful time and being able to know those things is really important.

PhysicianKB came from a home where her father was a physician, her mother was a nurse, and her and all her siblings are in medicine. She has now seen medicine through the eyes of a child and then experienced it herself as an adult. These experiences led her to be more comfortable with communication but also to experience the realities (stress, time, exhaustion) found in medicine with a level of confidence that others without prior exposure do not have. PhysicianRH noted,

> I don't have any family members who are in medicine. I don't have any family members who are nurses or doctors." She is one of six daughters and the only one who entered the STEM fields. She began her education as an engineer but found she wanted to give back to the community through healthcare. She chose to go to medical school but knew her greatest barrier would be being a first generation and having no previous exposure to the field which to her meant "I just had to work harder to learn what everyone did and why.

***Category Work Experience***

One of the core barriers found that led to the greatest level of impact regarding changing one's perspective about the roles of a healthcare team was the variable work preparedness when

interns are arriving on the unit on July 1st. In the United States, all residency programs begin on July 1st, which has led to research on what is called the “July effect,” where thousands of new doctors are seeing and treating patients for the very first time in hospitals across the country. Several nurse participants brought up this idea in the way of changing perspectives postintervention as all the participants were seasoned nurses working in hospitals that, each July 1st, welcome physician interns who are often embarking on their first job. These participants also supported the assumption that doctors lack understanding of the basics of roles, responsibilities, work hours, and so on. The participants provided insight that supported my own professional observations that nurses often have years of work experience prior to interns arriving on the unit, which allows them to understand the dynamics of a work culture where the intern is lacking experience.

NurseAS, a 5-year seasoned nurse, stated,

> in the buddy program I like the timing of it because they get to meet us before they hit the floor on July 1st. Which, as I’ve learned, is very scary for them. You know that I didn’t know how scary it was for them until the buddy program. And so, when we have, they have that familiar face, and they know they can come to us and ask us questions and we can say, "Well, the bathroom’s down there," you know, simple stuff like that.

Her perception of the intern changed when she realized their fear upon entering the clinical floor was based in their lack of basic skills, beginning with simple tasks such as where the bathroom is located all the way to the larger skills needed to treat patients and work effectively on a team. NurseLB reinforced the emotional state of July 1st by explaining that

> Nobody wants to work that day. We’re all like, "Oh great," it’s just a lot of frustration. Um, before the buddy program, um, before I knew how they felt, um, a lot of them would come off, like, "This is what I’m ordering. This is why I’m doing it." And you know, there’s a lot of ego and pride. I think, you know, they’re trying to look like they know things, um, and have confidence in what they’re doing. Um, and afterwards [the program], I’m like, "You’re scared. I know you’re scared. Um, let me help you," you know?

Her perception changed like NurseAS when she recognized that their ego was actually fear and they were just trying to prove themselves without looking like a failure on their first day of work. NurseLR continued the conversation of lacking preparedness and how the program allowed her to overcome the July 1st mentality and what her personal reason was for wanting to participate:

> I loved the idea of the two coming together, you know, and being buddies, you know, I like the idea of getting to know each other, working together on a project and learning more about, you know, what it's like to be an intern and hoping what I really wanted to impress upon the intern also is what it's like to be a nurse and kind of what the role of the nurse is. Because I think that is something that interns don't come in having that collaboration with nurses anywhere in medical school. So, by the time they get there, they really don't know what the nurse's job is, you know, what all their roles are. So that was the primary reason was to educate, learn about their role, teach them what a nurse can do and how much a nurse can impact the team. You know, if they have an understanding of the nursing abilities.

This program allowed NurseLR to use her own experience to educate those arriving with little to no understanding of the nurse role or the floor processes.

The physician participants spoke to their own fears, lacking knowledge, and how they had a level of comfort on July 1st by having a nurse buddy. However, they had no frame of reference as to how others before them arrived on July 1st because they were in a program that mitigated that issue by offering orientation prior to July 1st to build this relationship in hopes of preventing many of the issues the nurses spoke about with the July effect.

**Essential Theme Development of Relationship**

The essential theme of development of the relationship includes the categories of internal contact/interaction, relationships building, and safe space. The fifth interview question was created based on the responses to the survey that offered brief insight into how collaboration worked alongside patient care. The question was, "Can you offer insight into a specific component of the PBP that assisted you in providing better patient care?" In reviewing the impact of the intervention that then provided bases for future improved care, the very fact that

these two roles via the participants' insights were in no way brought together to meet, speak, learn, or grow as a team prior to this intervention left a long-lasting impact and grew long-standing relationships. The survey responses were specific to patient care; however, the interview questions investigated the role of relationship building as part of providing care. NurseLB said,

> Going into it, I was like, well, I have a rapport with residents. Why do I need this?" I was really impressed with the way that it allowed me to see things better from their point of view, which I had never put myself in their shoes exactly because I've been a student before, of course, in college, but I hadn't been in that role.

This impact of the program was driven simply by bringing the two roles together before there was conflict to attempt to relieve teams of this discomfort in their lack of understanding of each other's perspectives when it came to the care team. There was a shared feeling by PhysicianKB that just being together offered a level of insight not found in previous education or training:

> All the conversations with my nurse buddy, I think it just provided a lot of insight into just how things work in the nursing world because yes, we work side by side, but we actually have very different educations, and each hospital has its own barriers. I think it just helped me really step back and say, "How can I help this situation or what do we need to do to change our situation and make it happen?" Instead of getting upset with the situation. I think it just provided a lot of insight.

This statement alone led to the conversation on intentional contact and its impact on interaction.

***Category Intentional Contact/Interaction***

Intentional contact/interaction was defined as a vetted program solely focused on learning by direct in-person and meaningful interprofessional interactions. The literature review showed that no other program existed that mirrored that of their intervention and therefore the interview question looked to delve into their experience with other colleagues. The questions were "Do you know if any of your nurse or physician colleagues in practice participated in a similar IPE program during their graduate training? If so, what do you know about it?" The responses to this

question were a resounding “no” that none of the participants had met anyone who had participated in or experienced an intervention dedicated to the development of the nurse and physician relationship in a face-to-face capacity. The intervention was noted to have removed the them-vs-us mentality, built confidence in each role to trust one’s self and the team, and provided safety to trust the team to provide patient care. Changing the perspective on the relationship allowed for broader change to go across the floor even to those not participating in the intervention to create better working relationships and a better environment and ultimately translated to improved communication for patient care. The realization by nurses as to what the resident does not know and how to teach them how to prioritize their own needs so as not to overwhelm the nurse was highlighted throughout the interviews. NurseAS discussed the change to the relationship:

> Um, relationships. Um, if like, you know, like I said before, it was the us and it was them, but now it’s a relationship. It’s a professional relationship, it’s a working relationship. It’s, um, they know me, I know them and it’s, you know, because of the buddy program, it’s not just them knowing their buddies, it’s them knowing the other nurses too. I’ve seen a lot of nurses not in the buddy program just, um, have relationships with these residents. You know, we get to know them, and it really helps create, um, a great working environment. Um, which ultimately is the best thing for the patients, you know, this is what we’re there for so keeping those lines of communication open and talking to each other so that we can help the patient get better.

Here NurseAS noted that other nurses and physicians in the hospital benefited from those going through the program as they brought their skills to the unit and those were mirrored by others. Additionally, the skills the nurses and interns learned were taught to colleagues and role modeled as the norm instead of the exception, which created a more positive work environment. NurseLB highlighted her perspective change based on the program:

> I think I just never took the time to process the fact that they don’t realize when shift change occurs or what is involved in our report or when is a bad time to order labs, like in the ICU, it’s often stat. We want everything stat and explaining to them that if you have a new nurse and you order her to do 15 things at the same time, you need to let her know

> what you want done first because she may not just intuitively know, whereas someone who's been a nurse for 10 years, she would know what to do first, but a newer nurse isn't going to know that. Then helping them in their role too because they need-- just like the experienced nurses help to teach the new residents, the new residents need to help teach the new nurses, it's just an ever-evolving ball of teaching.

NurseLB recognized here that it is not just cross-professional training but instead a constant cycle of learning, teaching, and seeing the starting point of the other regardless of their role but instead based on their level of experience.

***Category Relationship Building***

The participants were asked to provide a single activity during the program that offered a long-standing impact on collaboration and in return they consistently noted the relationship-building activities that allowed them to self-reflect and remove previous biases so they might change perspectives and build human connection with the other as a human beyond a role or a title. NurseAS reflected on the emotional need to change perspectives:

> Um, maybe in going back to the word, maybe, um, my word I would say would use is humbling because, um, they-they're humbling themselves when they tell us how they really feel like, you know. When we do the top 10 things that they wish every nurse knew about them, they're scared. They don't know what they're doing. You know, they they've medical school, but they don't know what they're doing. They don't know where things are. And so, to me, that's very humbling. Um, and it puts the human into what they do. You know, you realize this is a human being in front of me even though they've gone through all this school. They're still human and they're still learning and they're still growing.

This perspective change speaks directly to the concept that formal education does not directly equate to job skills, role definition, effective communication, or the ability to collaborate but instead results in a degree and strong theoretical foundation in their chosen profession. However, it takes meaningful relationship-building activities to allow all people to see their teammates as human beings beyond their degrees.

PhysicianHG spoke to the research project as the activity that enlightened her perspective change:

> Absolutely, because we did our research project together. Working with different members of the team that aren't just going to be a co-resident or a faculty attending, being able to do that work together. It's not like this was a group project, it was a legitimate research project that we all presented together. We still have pictures with our poster and we became really good friends from the beginning. It set a really, really good foundation.

This project allowed the hierarchy to be removed by creating an opportunity for each member of the group to contribute equally. The project also taught research skills that many members had never learned, which acted as an equalizer in creating academic scholarship and presentation skills for each role from beginner to expert.

NurseLB found the clinical exercise to be foundational in her perspective change as the program works through a patent care scenario where both sides must enter orders, notes, and needs into the electronic medical record system. She speaks to the following,

> I thought that was one of the best things was for them to be able to see what at the time it was sunrise we weren't an epic at the time, but our screens I had never really paid attention to the fact that when you log into sunrise as a physician versus when you log into sunrise as a nurse, the screens even look different. Your labs presented differently, like everything looked different. I didn't know that they weren't seeing what we were seeing, and they didn't know that when you order labs the shift changed, they're not going to get done immediately. That was fun to share notes and actually get to see what the other side was seeing. Yes, it gave me, I guess I have more patience now, I guess, for things that I just thought were like you should know. I didn't realize they probably don't know. It's not something that because of just the way the program is set up and the way the computer system is set up unless they see it or have the ability to see it from our side, they don't know.

Using an electronic medical record system is a mandatory job skill and acts as the main method of communication between all team members and units even beyond that of the nurse and physician. The fact that nobody knew the screens were different had a huge impact in how they communicate immediate needs or how they follow up on previously ordered items. Several

participants mentioned that this activity was impactful to their own practice beyond that of the buddy program as now they know to pick up the phone if something is needing to be done quickly and to train new providers in this area before a conflict emerges and delays a task.

***Category Safe Space***

The participants noted that the entire year they spent together in didactics and social events provided them the ability to have safe conversation outside of the clinical setting, in turn providing insight into "the other" and their humanity. This program and its intentional programming allowed all participants to develop a sense of self above their role and a safety to share thoughts/feelings without the fear of judgment, retaliation, or ridicule. PhysicianPD highlighted this notion: "I could truly appreciate the buddy program for that, in that you have to feel safe, to feel vulnerable. I think that's the biggest piece." This program removed barriers and created a space of equity and equality for each person to be open about what they did and did not know about the other, void of judgment or assessments.

PhysicianCA spoke to her gratitude for having this training now that she is a practicing physician:

> I'm super thankful. I think that's something that like only leadership or places that are promoting leadership or places that are promoting better patient care, and Physician wellness, like all of it. Anybody that like cares, I guess, is willing to do all that, know that on my end, I'm thankful. Um, but in terms of like everything else, no, I mean is kind of like what I mentioned, it definitely helped. I felt like I was already an outgoing personality, but it did help me feel safe. It was a safe space, you know? Like going to a nurse, going to an MA in the future. Knowing that like okay, like, there's reasoning behind it. You just have to get to that depth part. You always have to get to know the person right before you judge and even then, don't judge.

She noted that the program removed fears in her approaching others, in removing her judgment until she knew the other person in the group, and that any place where leadership places this kind

of importance (time and money) to ensure nurses and doctors are communicating and collaborating should be thanked. PhysicianRH discussed the ability to meet and grow:

> I think having our sessions where we were able to talk to each other, talk about our experiences. I think that was quite defining. If there had been a lot of like lecture-based portions, maybe not quite as much as the discussion we had with each other. The most valuable portion is talking to each other in a safe place, where you're being prompted with questions or with the lesson, but I think not forcing the communication, but basically being like, "We're in this room to talk to each other and we're going to stay in here until we talk.

She spoke to other programs that are lecture based, simulation driven, or set around fake scenarios that never allow the relationship to be built as the buddy program allowed in a natural and organic way of just providing prompts to share feelings and experiences in a safe space.

**Essential Theme Organizational Influence**

The essential theme of organizational influence on the impact of the participants' abilities to communicate and collaborate once they left the program and entered their full practice was prevalent throughout the interviews and open-ended question on the survey. This theme includes the categories of role definition/hierarchy, hospital system processes, and a culture of leadership support.

NurseLB spoke about her experiences in hospitals and how they perceived the differences in the roles: "the C-Suite considered nurses to be like a dime a dozen versus physician is much, much harder to recruit. Anything the physician said was like gold and nurses were going to take the rap for it." She was speaking to the cost of recruitment of a physician in the hospital setting verses the cost of recruitment for a nurse. In stating this, she was alluding to the concept that hospitals place greater value on the physician role based often on the return on investment they will receive by recruiting a high earner. This organization-based money-driven mentality led to the nurses feeling like they are less than or like they are easily replaced.

PhysicianKB noted that, once she entered practice, she found the environment difficult to work inside but that with her skills from the program she has been able to facilitate some change:

> The people who are willing to adapt to that mentality more rather than this-- there was very much a physician-nurse barrier before. I'm the physician, you do what I say. I think that's created a lot of maybe-- I don't know, it was very distinct roles, now we're trying to create a little bit different culture. I think with that, either it's like you get on board or you don't, or you find another opportunity because eventually they become the minority.

She has worked to remove toxic behavior at the nurse and physician levels even if it means working half-staff to ensure her team knows the poor behavior will not be tolerated to show the hospital that she would rather work with reduced staff who are collegial and communicative than spend her days dealing with conflict. She noted that this change at the physician level has given her current hospital employer a new view of hierarchy, moving from role importance (doctor is more important) to high-functioning team membership as more important to the emotional status of their employees but also to their bottom line.

***Category Role Definition/Hierarchy***

As the topic analyzed the relationship between the roles of nurses and physicians, the next interview question looked to discover if the participants had still encountered issues in the hospital setting. The question was "Have you experienced conflict with your nurse/doctor counterparts?" The categories of role definition are based in the hierarchical structure of medical culture that can often lead to bullying and dismissive behavior. This professional culture is perpetuated in the hospital and seen between specialties, roles, and levels and is often the driving force to determining who is "in charge," which leads to silos and top-down relationships.

PhysicianHG spoke of her perceptions of the hierarchy found in the hospital setting and how that culture can be changed with this specific intervention:

> I think medicine, unfortunately in the past, was such a hierarchy that it has created this viewpoint that the attending is the untouchable, and that's not how it should be.

> Unfortunately, that power was highly abused for a long time, and so that's why, we're doing the Buddy Program to try to not push forward this hierarchy anymore, but to understand everybody's roles, but still be able to work together and create a degree of respect though. Because I don't want the nurses to have this view of residents and attendings as ever being like we look down on them or we don't respect their opinions. Unfortunately, back in the day, that's really how it was. Now it's trying to create a true team environment.

As she looks to the future and feels she has obtained the skills needed to create change, she feels empowered to adjust the narrative and culture to be more inclusive of team-based care and remove the archaic hierarchy of medicine.

NurseLB spoke of hierarchy in a separate mechanism, which is deciding who to call in times of uncertainty. She spoke about patient care and determining the roles and responsibilities:

> I'm going to call the intern first and then I can say like, "Oh no, we need to get the attending here first" or "We can call the resident." The ideal situation is you would call up and you follow the hierarchy, with the resident first and then the fellow and the attending, but it just depends on what's happening at the time.

This variation of hierarchy is based on experience and patient care needs. Due to a hospital's structure, the attending is solely in charge of not only the final patient decisions but also the supervision of the interns, residents, and fellows who are learning and providing care as well. This level of responsibility must be understood by the nurse to determine the best steps for their patient's needs. Here NurseLB noted that she would prefer to follow the chain from intern up to attending but has learned through experience and hospital structure that sometimes she must jump the chain to go directly to the attending for a final decision.

***Category Hospital System Processes***

The literature review showed that IPE is best supported through organizational support and dedicated time to professional development beyond the educational setting. The next interview question asked, "As a practicing nurse/doctor, did you observe any specific actions taken by the employers to address issues/conflicts observed?" The participants spoke directly to

the hospital system processes they believe to be stagnant and often broken, requiring persons to patchwork tasks to execute care. When the nurses understand each hospital's and floor's nuances, but the intern does not, it can lead to conflict as the intern is working with a lower level of experience, which drives them to remain working by the book until they realize that is not how the work gets done. Next, when hospitals place decision-making power on physicians over nurses, even though it is team-based care, it creates a feeling that the physician's voice is more important. Finally, high turnover in nurses and the constant rotation of residents every 4 weeks requires constant new member team building. Due to already tight time constraints, working towards true team cohesion becomes impossible in turn leading the nurses to work individually to secure patient care through this constant change. This high level of turnover in both the learner and the nurse has been noted in the literature to lead to burnout and patient care issues (miscommunication, poor planning, inadequate care, late or faulted discharge). Here the participants discussed the reality of working in the hospital system.

NurseAS discussed the barriers she faces due to a lack of understanding by the hospital organization and physicians with regards to the relationships she builds with her patients and her daily responsibilities:

> Because the doctors don't do what we do. We're on the grounds. We're the soldiers, you know. We're the ones doing all the work. We're the ones giving the meds. We're the ones getting them up. We're the ones talking to them and developing those relationships with them. And not that the physicians don't develop rapport but of course we develop relationships with them but they're not in the rooms constantly, you know?

Her comment is based in that she feels lesser than as she does all the daily work and builds the relationships and then the physician will walk into the room, sometimes negating her presence, only to be seen by the patients and the hospital as the sole provider of their care. This concept is heavily reinforced by hospital systems that promote physicians as "in charge" through

their visible differences in varying scrubs, larger badges, and long white coats, whereas the nurses see them by their sporadic appearances in patient rooms. This is often reinforced by nurses having to say to patients "we will see what the doctor says" simply because they must wait for the physician to order meds, food, update care plans, and determine when discharge can happen. NurseAS noted that "the nurse checks the medicine status constantly, ensures the food is tolerable and gets the complaints, drives the care plans based on real time needs and prepares all aspects of the discharge," yet the doctor gains the credit for good service and the nurse is blamed for perceived poor service.

PhysicianKB spoke of how her hospital has handled large-scale changes in staffing:

> There's just been a really multifaceted couple years here, stressful, very multifaceted. I think it has been everywhere. A lot of people have experienced a lot of the same things with a lot of turnovers, mostly in the nursing staff. We had to move to a different unit, because our unit was being renovated, but it was not exactly ideal, and things like that. It was multifaceted. It's just stressful. We are short-staffed, they're short-staffed, we're all working a lot.

She went on to speak to the additional stress on an already high stress critical care unit has challenged the hospital to work with teams to mitigate conflict as they face increased turnover. However, it seems the hospital has been unsuccessful in driving organizational change, leaving the relationship building and conflict management to occur on the floor between the roles without leadership support. PhysicianKB noted that she believes her skills in conflict management and stress reduction were learned in the program and had she not had them she would have most likely left her hospital early in her career given the lack of hospital-based support in the face of nurse turnover, building renovations, increased patient counts, and lacking resources, which led many to burnout.

NurseLB spoke of her hospital culture by saying,

> It very much feels like that authoritative like, we're the doctors, we're the authority and you're gonna listen to us. Very punitive, rather than sitting down and having a conversation, what can we as a- as a group, what can nurses and residents and physicians do together to make this better? What went wrong? How can we fix it?" Um, it's automatically blaming nurses and not admitting any fault of their own.

This feeling is reinforced by the hospital structure of physicians being made the final decision makers on patient care even when they behave poorly or create conflict among the team.

***Category Culture of Leadership Support***

Given the intricacies of the clinical care unit, there is a clear divide between the importance placed on conflict resolution between the providers of care and the business of medicine. The next question delved into the current dynamics of these participants' clinical practice and relationships by asking "Tell me more about your relationship with your peers and nurses at work." The follow-up question was "Tell me more about how you have dealt with IPE conflict in practice." This question looked to gauge if the tools and skills learned in the intervention translated to how they dealt with conflict postintervention. The participants noted that even the best teams have conflict, but this conflict lacks appropriate resolution as the process for complaints is often closed-looped, removing trust in the system and opportunities for professional growth for nurses. If the issue is with patient care (the business of medicine), there is swift and immediate action, but if there are interprofessional conflicts (providers of care), it is a computer submission for the complaint with little to no follow up and no requirement to sit down and have a crucial conversation. Therefore, the participants often did not tell anyone if there was conflict as they thought it would lead to unit gossip before it led to resolution by hospital leadership. PhysicianRH explained,

> In our system, I don't know if it can be anonymous, you can report medical errors. In that, they've also allowed you to report professionalism errors or encounters and I think you have to provide some contact information so that they can get back to you and get more information. There is a process, a formal process that you could submit if you're having professionalism issues. I think a lot more often though, we'll take conflicts to the

> administrative nurses on the floor. If there is a doctor-nurse disagreement, it usually starts at that level. Unfortunately, I don't think it's handled super well. I think that gives it a lot of ways to become gossipy. A lot of people get involved that are too close, they're friends or really close to the people involved on both sides. I think it can become a little bit-- you don't want to raise that concern because you don't want it to become ''a thing'', even if it was something that was inappropriate.

The system she is referring to is a computer-based complaint report that differentiates between patients' concerns and professional issues. In this case, the professionalism issues begin with a conversation between the parties by going to the "boss" to deal with the situation instead of a mediator provided by the hospital. This opens itself up to working with people who may or may not have the skills to manage conflict and can be hindered by personal relationships. These barriers often prevent complaints from being submitted, leading to perpetual issues between the conflicting parties.

NurseLB discussed her personal experience with dealing with conflict in her hospital setting:

> Foremost in my mind, there's been two different situations and I handled them differently because one was a physician that I actually had a rapport with and worked with regularly and the other one was a physician that I don't normally work with. With the physician that I did not normally work with, I did the formal-- actually ERAF event review for professionalism. I was heard and it was a good thing. He spoke with my director, executive director of pediatrics, personally in regard to it, and it went further above my head and out of the way, but I was reassured that it definitely was taken seriously. It was actually a HIPAA issue, so it was definitely a concerning problem. I had a very positive response in doing it that way. Then the other one was also a professional issue, but since it was with a physician that I worked with regularly and closely, we had a sit-down meeting with one of the other PICU attendings, and then my boss. Just the four of us sat and shot it basically is how that one was resolved. I feel like it went well as it could possibly go. It was more of an informal conversation. After the fact, not really retaliation. I was avoided. I think she tried not to; I'm not going to step on her toes. I wasn't the only person this attending had issues with, and she eventually left.

As you can see the Health Insurance Portability and Accountability Act of 1996, or HIPAA based patient care concern, was swiftly resolved with intervention from leadership and the relationship between the parties was not hindered as they did not often work together. In the

second case, the nurse worked with the physician, thus it was a professionalism issue and handled more informally, and although resolved, the issue led to tension between the parties until the physician left the hospital. The second scenario speaks to the earlier participant comments about issues becoming gossipy and leading to floor conflict given the lack of leadership-led resolution.

NurseLR spoke of the system in her hospital as well as others she has worked within:

> I think ours is better than some hospitals I've worked at as far as allowing, at least from a nurse perspective, the nurse to say, "No, I don't like what's going on here. This was not safe for the patient." You know, they're so quick to say, "Well, submit an ERAF and what I wish the hospital did better was follow up with the-the nursing that submits the ERAF to find out, you know, did this go any further? You know, our director may say, "Oh yeah, we got that ERAF, you know, but really no follow-up or bringing the parties together that were involved for any kind of follow-up." So, it's very much risk assessment oriented. I feel with, you know, get that ERAF done right away. You know, everyone will say that quickly when there's an issue, "Have you submitted the ERAF?" "Yeah, but I also would like to just talk it out and debrief it after, you know, whatever happens." I feel like, you know, we do have a lot of avenues to express those concerns, but they never really bring it back together. I don't feel like it is-- the follow-up is very good at my hospital.

This example of using a system to submit a complaint but never following up to resolve the issue is a check-box move that does little to nothing to build trust among employees and the business of medicine (leadership). In having people wanting help with resolution and then not providing them that avenue in turn decreases their trust and eventually keeps them from bringing up issues that could result in poor relationships and decrease effectiveness in patient care.

**Patient Care**

As noted, an additional study purpose was to understand how participation in an early intervention program can impact communication skills and perceptions of nurse–physician collaborative relationships once in practice to provide better patient care as an outcome of the study. The ICCASr survey offered two open-ended questions, the second question being, **"**Please

provide three examples of communication and collaboration skill application you've utilized with your nurse/physician counterparts in the last 12–36 months (this can be a story or situation example)." These responses offered insight into the roles and their relationship to patient care as well as insight into the "other" role. This question was explored in greater detail during the interview process as shown in the essential theme above "development of relationship" with a focus on how the relationship built between the two roles played a part in the care provided. However, the survey responses provided self-descriptions on how the program directly impacted participants' skill utilizations applied to patient care as shown below. As noted earlier, the survey was anonymous, so there are no identifiers for role or name but instead direct quotes from the question itself, and because it was a survey, these responses were used to create the interview questions to explore direct observations for interview participants as highlighted in the previous section. These quotes stand alone in exploring how the program impacted communication skills and perceptions of nurse–physician collaborative relationships once in practice to provide better patient care.

> I work with my medical assistants [a medical assistant is a health professional that supports the work of physicians and nurse practitioners in a clinical setting] and let them know what they need to do for me I inform my office manager of difficult situations and get her involved with dealing with patients I assist my nurse in procedures.
>
> I regularly seek input/opinions from my nurse counterparts, and find the quality of communication between and collaboration of our different roles to be enhanced.
>
> Open dialogue more easily when I have concerns. Recognize physician time constraints and practice being more concise.
>
> Asking what the barrier to your request is, sometimes there are policies/guidelines in place that physicians are unaware of, asking what the concern is to allow opportunity for discussion, asking nursing perspective of a patient's overall state as it is often different from the physician.
>
> Confirm written orders verbally, include nursing input with decision making, follow up with question post interventions.

Discussed with nurses what obstacles they have to seeing patients with lengthy clinic visits.

We have open communication We get to know each other without judgement, and it enhances the working relationship We trust each other's decisions with patient plan of care instead of us judging and creating conflict.

Mutual respect, frequent huddles, delegation of tasks with accompanying independence with completing said task.

1. approaching the physicians during their handoff about important lab results without worrying that I will interrupt them. 2. Seek out the physician during my care times and ask if they would like to assess the patient at this time as opposed to not taking into account their need to assess the patient as well. 3. Feeling more comfortable to ask questions without worrying or being judged.

Able to communicate a patient needs and explain why a certain vascular access line is needed ongoing collaboration with our physicians dealing with procedures able to get timely devices for inpatients who need frequent vascular access needs.

With my skill application, I have been able to round with the physicians on a patient of mine that I was concerned about. I was able to share my thoughts and professional opinions with the care plan and be notified of changes in real-time. I was seen as an active member of the team in the collaboration of care for the patient and was able to act on helping improve the patient's condition in a more immediate time frame. 2. Due to the physician's familiarity and comfort with the nursing team and myself, there have been many instances that the physician has sought me out personally on the unit to discuss and inform me of changes with a patient's care. I also see this happen frequently with other nurses on my team. 3. I had a situation where a physician ordered a patient to have a lab draw using vascular access. I was able to approach that physician professionally and educate them on unit protocols in regard to lab draws and needle sticks on patients. Because our current vascular team serves in two roles as the sedation team and the vascular team, their availability is sometimes limited. Therefore, the nurses use protocols for difficult lab draws by having more experienced nurses attempt the lab draw before contacting the vascular team. This also allows for seasoned nurses to help educate and improve the skills of less seasoned nurses in regard to lab draws. The physician was grateful for this knowledge and now often calls the nursing team when they suspect a patient may be a difficult stick when labs are needed.

Communicating my management or work up next steps to nurses.

No specific examples but the program helped me understand better what the interns and residents go through prior to and during their schooling. It made me feel more comfortable around them and discussing patient issues and concerns with them.

Called upon her for support with a situation. Sought her out for information and advice. Supported her in her new supervisor role.

1. Seeking out the nursing perspective in vascular access for a difficult patient - I discussed this case with the bedside, charge, and vascular access nurses to gain their perspective and share mine. This was a child who had experienced an extended (>1 month) hospital stay, had a central line for access and a chest tube. He would scream/cry during dressing changes. However, I sought advice on keeping vs removing the central line (as it was such a reliable way to give pain/anxiety medication for chest tube removal vs the risk of infection of an indwelling line). Once I made a decision, I also discussed my plan with the bedside and charge nurses, acknowledging the risk of infection but ultimately knowing reliable access would make the experience better for the patient, family, and bedside nurses when we could give medication during future procedures. 2. Frequent collaboration/"checking in" to assess any issues on the floor. Being more visible (not hiding in the workroom) allows for open communication between bedside/charge nurses and the physician team. This way, we can discuss any issues that have come in after rounds or any other new concerns that have arisen. 3. Building these relationships over time help foster a "safe space" for nurses to voice their opinions. I think I always value and respect the opinions on our IP teams, and this reputation has meant that nurses feel comfortable coming to me to discuss issues/questions/concerns. Recently, a nurse came up to express her discomfort in moving a patient from different unit, and we were able to have a good conversation and ultimately kept the patient on his current unit based on the level of nursing care he was requiring.

I frequently discuss the sedation approach to include medications and dosages that would be the most beneficial for our patients with the attending sedation physician. 2. On a recent interaction with a resident who had ordered multiple labs on a very small child throughout the day, I suggested that we consolidate lab draws and review the necessity of each lab. We were able to decrease the number of labs draws improving patient and parent satisfaction. 3. During a sedation team meeting between nursing and physician staff, I discussed the need for ensuring accurate weights as we had a case where the nursing and physician team on that case had entered an inaccurate weight and attempted to sedate based on this weight. The discussion was professional, collegial, and resulted in an improved process for verifying patient weights.

I had a new resident in the PICU tell a new grad picu orientee that the “patients sats of 91 are fine” on a patient with a normal baseline. When I overheard this, I felt the need to look into and educate both parties as to what was and was not truly “fine” when it came to this patients O2 sats and the importance of really assessing the child and looking at more than just a O2 sat number. The knowledge I received in the Buddy program helped me not feel frustrated or angry with what I would have dismissed previously possibly as irresponsibility or incompetence.

1. Feel more comfortable reaching out to them via Skype 2. Better communication with how they do things 3. Enhanced efficiency in a team setting.

> Providing an explanation about care plan to nurse of ICU patient. We discussed plan, recognition of when plan might need to be adjusted and how to proceed. Discussion with an ICU charge nurse regarding feeding regimen for a medically complex patient and how to meet child's home regimen safely during this child's admission. Provided patient update to consulting pharmacist to ensure adequate dosing for antibiotics in context of possible line infection.

Each of these direct quote examples highlight how the program impacted participants' abilities to execute team-based patient care that is shown to derive from open and constant communication with their teams and an ease in approaching the other members of the team to determine effective and compassionate care needs.

**The Impact of a Single Word**

The final interview question was asked to investigate the program's impact through a single word: "What is one word you would use to describe the PBP?" This question generated different words that were then defined by the participants in their own terms. A few participants provided more than one word and two provided the same word but a different example for the definition. Figure 6 shows the participants' provided words and definitions in their direct quotes. The following sections present participants' explanations of their definitions for each word.

**Figure 6**

*Wordle*


**Understanding**

> I mean, understanding realization of the expectations that are on interns and physicians, and then sharing that understanding with them that, you know, yes, I understand how busy you are and, you know, what all the commitments you have. And then the understanding on their part of how busy a nurse can be day-to-day and even now, and then outside. I mean, both, you know, that realization I think I saw, again, seeing them more as a whole person and having them see a nurse as a whole person, rather than the nurse at the bedside who's gonna go get that lab you ordered, you know, the whole person. I think that, so understanding empathy, both of those things, having that empathy for the other person as a person. (Nurse)

**Efficiency**

> The goal of the program behind the buddy program is to unite all of these four fronts and see like, how all of our minds can come together and just make the system better and communication improved and ensure patient safety, efficiency, workflow, all of it. (Physician)

**Insightful**

> It's so funny because when we're younger, we have our eyes on a different prize and then things come up. I think getting to know the nursing staff and understanding the limitations, or maybe not limitations, but just their workflow and their perspective, I guess, is a better way to say it, it really is just so important to be able to provide good

care from a teamwork standpoint. That was a first introduction in learning a lot from a nurse's perspective and how that guided my attitude towards making sure I asked questions instead of just demanded. Not demanded but complained or was annoyed or whatever. I think it just helps nursing or overall patient care as well when you're on the team and you're all working together. It was a good introduction to that." (Physician)

**Humbling**

They're humbling themselves when they tell us how they really feel like, you know. When we do the top 10 things that they wish every nurse knew about them, they're scared. They don't know what they're doing. You know, they they've medical school, but they don't know what they're doing. They don't know where things are. And so, to me, that's very humbling. Um, and it puts the human into what they do. You know, you realize this is a human being in front of me even though they've gone through all this school. They're still human and they're still learning and they're still growing. (Nurse)

**Beneficial**

Experience was beneficial for me, so because, like even now I, [name redacted], which was my nurse buddy was a nursery nurse and I have ongoing relationships with my nursery nurses for sure, but I also think that it informed my experience to help me think of those layers as I'm trying to communicate. (Physician)

It means like it's one of those things when I go against what I didn't realize it was going to be helpful really, but it turned out that it was in the end extremely beneficial I feel like for both sides (Nurse)

**Synergy**

It's all different parts of a team working together. That's literally what it is for me. That's why I liked that word. I would say for our Buddy Program-- I'm trying to think of the word that-- Almost new age because you don't see a lot of programs doing this, and it's important. (Physician)

**Layered (Scaffolded)**

It was definitely layered because there was that like introduction piece where we just barely trying to figure out what are we doing? Then there was that next layer where you actually get a little more comfortable. Then there was that next layer where we were all working, and we'd actually see our nurse buddy pop in, and that person was the one person you knew from the very beginning that wasn't part of your profession but is someone from the hospital. Then there is the layer of if you happen to work with that nurse buddy, which like I did with my buddy in the nursery so that relationship's deep from you walk in, you already know that person. (Physician)

### Collaboration

> I think the residents definitely have a better perspective. At least in understanding of if for some reason say, like we're not able to get ahold of a nurse, or something's happening, or they can't-- Or, if were like, "Oh my God, we need this kid to have this done stat," blah-blah-blah. You have a better appreciation when they're trying to juggle a ton of different things. It also is the same with the nurses and understanding the residents. Working on it together, but also again, getting an appreciation for that part of that job, just as so simple as putting in a pediatric IV is really freaking hard, especially they're dehydrated. Having an appreciation for that too. Not just an understanding when we need antibiotics in this kid now. Well, there's not much that the nurses can do if the antibiotics aren't up or tuned up yet, and they're like, "I've called down five times the pharmacy," and it's like, "Okay." Again, not saying like, "You need to fix this," it's saying, "What can we do to get this mobilized? Because the one thing that I know that I can't do is actually, I can't scan it and hang it because I don't know how, and so it's like, "What can I do within my power to help you so we can do this together?" Instead of being like, "You got to figure it out. This is what I want, do it." It's not how it works; we have to collaborate between what we can and can't do to get the job done. (Physician)

> I think it really means working together and valuing each other's input into the situation. It's not just working alongside each other, it's working together. (Nurse)

### Summary

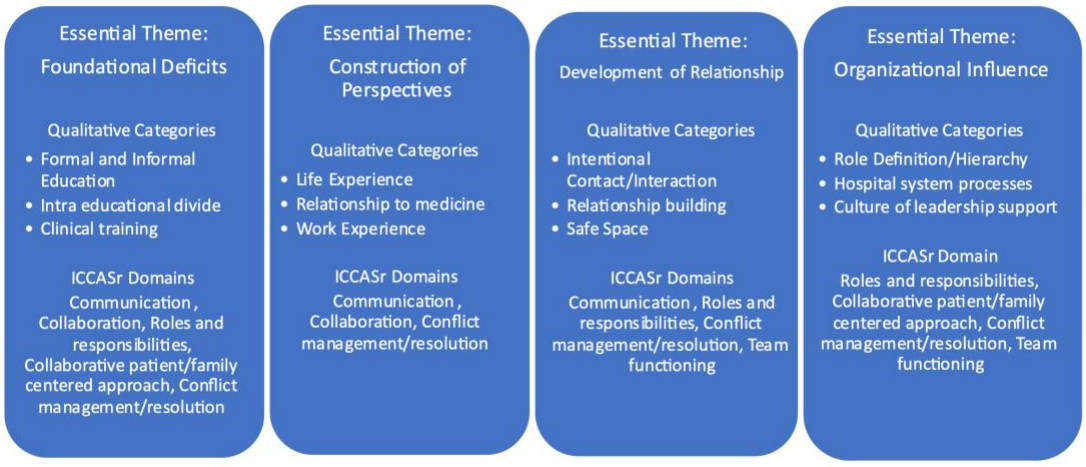
This chapter provided data obtained from the interviews and open-ended questions found on the ICCASr survey to include demographic information, length of interviews, page lengths of transcribed interviews, and the process used for coding and analysis. The result was four essential themes and 12 categories discovered from the analysis, which I explained throughout the chapter in a narrative format with my interpretations and direct participant quotes.

The four essential thematic interpretations were foundational deficits, construction of perspectives, development of relationship, and organizational influence. Each essential thematic interpretation was influenced through the discovery of categories found through coding and categorizing data obtained from the participants' interviews. The categories of formal education, intra-educational divide, and informal education/clinical training influenced the essential theme of foundational deficits. The three categories of life experience, relationship to medicine, and work experience influenced the essential theme of construction of perspectives. The three

categories of intentional contact/interaction, relationship building, and safe space influenced the essential theme of development of relationship. The three categories of role definition/hierarchy, hospital system processes, and culture of leadership support influenced the essential theme of organizational influence. Figure 7 details mixed methods integration in relation to essential themes.

**Figure 7**

*Mixed Methods Integration*




Throughout this chapter, the participants offered their experiences with the intervention and how their participation in the program impacted their ability to collaborate and communicate with their team once in practice and ultimately how those skills were applied to patient care. The emergence of the themes through categories discussed in this chapter highlight the deficits in current medical and nursing education in providing necessary job-related soft skills to ensure the positive collaboration between nurses and physicians in the clinical care setting. Next, the participants offered their own change in paradigms as they learned to see the other as human and through a new lens of patience and understanding. Additionally, the themes highlighted the

participants' beliefs and feelings as to how an early career intervention can not only improve the relationship between the two roles but also have long-lasting effects as they change jobs, promote, and advance their careers with new team members where they can take the skills they have learned and provide them to others not involved with the program. Finally, this chapter provided support regarding the importance of continuing education and support needed in the hospital setting postformal education to maintain positive relationships and build trust of employees towards hospital leadership.

Chapter 6 concludes this study with a discussion of the integrated findings, theoretical connections, research implications, and recommendations for future research. An update to the current Interprofessional Learning Continuum (IPLC) Model generated from the integrated mixed methods findings is explained using a narrative description. The findings address the research questions. By using a mixed methods approach, combining the ICCASr survey with open-ended questions and interviews, Chapter 6 provides a more comprehensive understanding of the overall research aim: how participation in an early intervention program can impact communication skills and perceptions of nurse–physician collaborative relationships once in practice.

# Chapter 6: Discussion, Implications, and Recommendations

The purpose of this explanatory sequential mixed methods study was to evaluate the impact of a structured IPE program on its graduates' use of effective communication and collaborative behaviors postintervention as a preventative means to later career-related conflict between nurses and physicians. Additionally, the study aim was to understand how participation in an early intervention program specifically impacted communication skills and perceptions of nurse–physician collaborative relationships once in practice to provide better patient care. In this chapter, a discussion of integrated quantitative and qualitative findings is explored as part of the mixed methods study design to offer insights into the connections between the numerical statistics from the ICCASr survey and the narratives provided by the participants via their open-ended survey questions and interview responses. Finally, the chapter provides a connection to theory, highlights implications, and offers recommendations for future research.

## Mixed Methods Integrated Findings

As this was an explanatory sequential mixed methods study design, this chapter addresses the mixed methods amalgamation of quantitative and qualitative findings. This mixed methods explanatory sequential design was divided into two distinct phases. Phase 1 began with the collection and analyses of quantitative data via the ICCASr survey, followed by Phase 2, using qualitative methods derived from open-ended questions and a semi-structured interview. Utilizing the mixed methods methodology offered a more in-depth assessment of the program's effectiveness to determine if learning through knowledge, skills, and attitudes as a preventative measure enhanced physician perceptions and behaviors postintervention once in the workplace. Using mixed method research to evaluate the long-term impact an early career intervention has on practicing healthcare teams provided insights into numeric perception rating scores combined

with the participants' voices in search of a shared language and group experience to effect behavioral changes.

To address the quantitative phase of this study, the following research questions directed this section of the study:

1. Is there a difference in the participants' perceived abilities across the six domains as they recall them on the ICCASr pre- and post-assessment?
2. Is there a difference between factor outcomes on the ICCASr pre/posttest between nurses' and physicians' professional roles?
3. Is there a correlation between posttest factors for each participant group (nurses and physicians)?

Data were collected using the ICCASr survey that tested perceptions on six domains associated with interprofessional communication and collaboration ability pre and postintervention. The participants were asked to rate their abilities on a 5-point Likert scale (poor to excellent). The first rating focused on their perceived abilities in the six domains as they recalled them prior to training, and then again as they recalled them once the training was done. All items within each factor were rated two times to evaluate perceptions before and after learning activities, resulting in a total of 40 ratings. The six domains assessed on the ICCASr are: communication, roles and responsibilities, conflict management/resolution, team functioning, collaboration, and collaborative patient-family centered approach.

To address the qualitative phase of this study, the following research questions directed this section of the study.

1. How do nurses and physicians describe their communication and collaboration with each other after participation in the program? (Interview responses)

A series of 12 questions were developed from the quantitative results to guide each interview, but given their semi-structured nature, probing questions were used to understand context and meaning. Each participant provided their experiences and perceptions related to the intervention and what they had each taken from their participation back into the unit. The ICCASr survey asked two open-ended questions that offered support in the development of the interview questions. Both sets of narrative data were used in the interpretive analysis.

The overall mixed methods design aimed to answer how participation in an early intervention program impacted communication skills and perceptions of nurse–physician collaborative relationships once in practice to provide better patient care. The integration of quantitative and qualitative study findings is "arrayed one after the other, in parallel fashion" (Creswell, 2015, p. 84, as cited from Pam Scott, 2019). Given the steps of data collection utilized, I highlight the quantitative results and provide qualitative results throughout this chapter, which offers a deeper dive into the context relevant to the quantitative results. The process for mixed methods data analysis was performed in the following order. First, quantitative survey results were collected, cleaned, and analyzed. The survey's open-ended questions were reviewed, coded, and analyzed. Interview questions were developed based on areas from the survey that benefitted from greater depth using a narrative format to provide context and experience. Interviews were conducted and the transcriptions were cleaned, coded, and analyzed. Domains from the ICCASr were then captured using a charting mechanism to outline any connections between the numerical findings, stories shared, and insights gained that supported the statistical analyses.

## Research Question Synthesis

### *Quantitative Phase*

The first research question asked if there was a difference in the participants' perceived abilities across the six domains as they recalled them on the ICCASr pre- and post-assessment. To answer this question, six paired samples *t*-tests were conducted to evaluate difference in the participants' perceived abilities in the six domains/factors. Results showed that there were statistically significant differences with a large effect increase in scores between pre and posttests. Based on the results, the mean scores calculated were significantly greater for post-perception scores, indicating there was a significant difference in the participants' changes in perspective surrounding their skills in all six areas following the intervention.

### *Qualitative Phase*

An analysis of each domain included on the 20-item ICCASr tool suggests that the qualitative results support the quantitative results of this study. Narratives were used to dive deeper into the possible reasons there was a significant increase in scores reported after participation in the program in the participants' perspectives surrounding their skills in all six areas: communication, roles and responsibilities, conflict management/resolution, team functioning, collaboration, and collaborative patient-family centered approach. During the analysis of open-ended questions and the interview process, these specific domain areas were included in questions asked to determine specific examples of how the area domains on the survey were impacted through narrative descriptions as shown in Chapter 5. The intervention curriculum focused on the development of all six domains using interactive methods for all activities and working to allow the adult learners to participate in the creation and implementation of projects to provide a sense of inclusion in the learning process. The interviews

provided insight into the participants' feelings that the intervention introduced multidisciplinary communication, teamwork, and quality work, which they did not have exposure to in medical or nursing school. Throughout the analysis, participants acknowledged that this specific intervention was a huge part of changing patient outcomes and quality of care in the more realistic time frame as they were provided skills to use immediately in their training. The program promoted relationship-forming through interactive activities that allowed the participants to learn and immediately apply skills designated as IPE domains such as listening exercises, conflict resolution skills, and learning the roles and responsibilities of the other in the clinical care setting. These insights provided support for the increase in postintervention survey results as they highlighted that the intervention effectively focused on these areas and offered curriculum and application of the domains.

The study found that current research does not offer a shared definition of collaboration by both groups and recommends organizations provide opportunities for supporting IPE by creating workshops, open forums, and training programs that directly focus on developing respect, collaborative skills, and working relationships, given the lack of formal education (Nair et al., 2012, p. 119).

***Quantitative Phase***

The second research question asked if there was a difference between factor outcomes on the ICCASr pre/posttest between nurses' and physicians' roles. To answer this question, an independent samples *t*-test was conducted to compare each domain score for nurses and physicians prior to and immediately following the intervention. Results showed there was no significant difference in scores for nurses and physicians based on role; however, the magnitude of the difference in the means ranged from moderate to large dependent on the domain assessed

with all showing improvement. Based on the results, the mean scores calculated were significantly greater for post-perception scores, indicating there was a difference in the participants' changes in perspective surrounding their skills in all six areas based on their professional role.

***Qualitative Phase***

The results from Research Question 2 (Is there a difference between factor outcomes on the ICCASr pre/posttest between nurses' and physicians' professional roles?), using independent *t*-test to look at individual roles and changes pre and postintervention, indicated that any change that occurred during the program was effective for both nurses and physicians at similar rates. These first two outcomes supported through qualitative interview responses via questions directly related to the intervention "Can you talk about your experience in the Pediatric Buddy program (PBP)?" and "What stood out to you as the defining characteristic of the program?" highlighted the improvement in the areas of communication, roles and responsibilities, conflict management/resolution, team functioning, collaboration, and collaborative patient-family centered approach. Iterative analysis across roles provided insights that the intervention curriculum and activities offered self-reflection and group discussion focused on self-driven realization of all the roles that the physician and nurse play in the clinical unit and in academic medicine, which was driven primarily by participants removing judgement and beginning to see their teammate on an individual basis as humans above titles. The program also led to a sense of empowerment as the nurse participants noted that prior to the program they felt like they were "just a nurse" trying to complete their jobs as best they could without the team-based support. Many noted they did not think anybody cared if they had an opinion about their patients' care. Many mentioned that with experience and the program bringing the roles together they now have

input on patient care and the relationships they built with patients was respected as an important part of the care management process. This inclusion in the team and recognition of the nurse and patient relationship gave the nurses a sense of pride in that they are now a true part of the care team. The physicians noted that when it came to collaboration, the nurses did not trust them given their lack of experience upon entering the clinical care unit. After the program, they realized that once the nurses built a relationship with them they saw a difference in the trust provided with respect to clinical judgment and that translated to how the patient perceived the team. Again, after looking at why the domains increased for both roles, it was stated and realized through analysis that the program taught these teams not only why they should work together but how to do so effectively using relevant activities. The intervention helped participants see how to work as a team, whereas, in formal education, they had primarily observed the other as an outsider, often not having positive role modeling to provide a glimpse into the importance of interprofessional collaboration in practice. The physician participants noted the difficulty they found in being integrated into their new doctor teams let alone into the interdisciplinary team with a nurse. The takeaway from their experiences was that the program taught them "more about how to collaborate and not just coexist." These insights provided support for the increase in postintervention survey results as they highlighted that the intervention effectively focused on the domains and offered curriculum and application to both roles equally as shared partners in learning, allowing them to both grow together.

This study highlighted Allport's (1954) contact theory in that current formal and informal education lacks current IPE programming as today's programs do not require human contact as part of the intervention but instead utilize simulation and online modules. The contact hypothesis suggests that interpersonal contact between groups can reduce prejudice and allow growth, and

this was seen prevalently throughout the qualitative portion of the study through participants' narratives focused on the simple fact that being in the same room removed many preconceived notions of the other (Nickerson, 2021).

***Quantitative Phase***

The third research question asked if there was a correlation between factor outcomes on the posttest between nurses' and physicians' professional roles leading to a bivariate Pearson correlation coefficient (r) to be calculated to determine if there were any significant relationships between the 20-item ICCASr survey instrument and each participant's role. The results for the physician role showed a strong, positive correlation between all six variables with high levels of physicians' perceived associations between each domain. The relationship between nurses' perceptions on the six domains were shown to have strong positive correlations between most areas with three paired groups not meeting statistical significance. There was no significant correlation between perceived collaborative/patient-family centered approach associated with communication ($r = .62$, $n = 9$, $p = .19$). There was no significant correlation between perceived team functioning associated with communication ($r = .57$, $n = 9$, $p = .11$). There was no significant correlation between perceived collaborative/patient-family centered approach associated with conflict management/resolution ($r = .62$, $n = 9$, $p = .077$). The results for the combined participants showed there was a strong, positive correlation between all six variables with high levels of perceived associations between each domain of communication, collaboration, roles and responsibilities, collaborative patient-family centered approach, conflict management/resolution, and team functioning from both roles when analyzed together.

***Qualitative Phase***

The qualitative question from the survey ("How participation in an early intervention program can impact communication skills and perceptions of nurse–physician collaborative relationships once in practice to provide better patient care") offered examples as to a possible cause of why there was no significant correlation for nurses between perceived collaborative/patient-family centered approach associated with communication. The domain of collaborative/patient-family centered approach used questions related directly to the integration of the patient in the health situation and decision-making process, whereas the communication domain spoke to listening, expressing ideas without judgment, and providing constructive feedback, which the nurses noted did not connect in their own thought processes. They separated the communication with team piece from the inclusion of the family and noted that being able to speak to their colleagues did not necessarily impact their relationships with patients. The nurses still felt as though their relationship with the patient was separate from their care team relationship as they see themselves as the ground soldiers who execute the tasks using their own levels of critical thinking and continuous conversations with patients to ensure the care is meeting the patient's goals. They saw the communication piece as specific to ensure the management of diagnosis was being executed but did not connect that action with the application of care or family centered decision making. However, it was identified that the more robust the team communication was the better the nurse was at seeing a bigger picture beyond tasks to begin to critically appraise the care plans using their insights into the social dynamics of the family needs.

There was no significant correlation between perceived team functioning associated with communication ($r = .57$, $n = 9$, $p = .11$), which also speaks to the understanding of roles with a

specific focus on the domain questions, looking at communication and team function the development of care plans requires all members and the negotiation of responsibilities with overlapping scopes of practice regardless of the mode of communication. The nurses, depending on their shift (night or day), spoke to these dynamics being specific to the level of autonomy they were provided, the number of staff on a team, and the trust built to allow them to be part of the discussion with the other role to better understand their abilities and skills. Noting that in the day there are far more providers of all roles on the floor than there are in the evening, leading to a higher need for trust in the evening. Nurses with reduced physician staff on the night shift changes the perceptions of the entire team as to when to be included and who will develop the planning verses executing the tasks as it is an all in endeavor with a smaller team to provide patient care. Ultimately, the nurses' narratives spoke to these two domains as dependent upon who was on a team, what was needed for the patient, and how much autonomy was necessary, which led to a lack of connection for them in the specific questions on the survey.

There was no significant correlation between collaborative/patient-family centered approach associated with conflict management/resolution ($r = .62$, $n = 9$, $p = .077$) in the nurses' responses, which was surprising given the insights that had been discovered in other areas. However, after analysis, the results showed that patient-centered care and conflict resolution were not seen as connected but instead separate focuses impacted by outside factors. The nurses noted that, after the program, they gained greater patience and trust with their young physician colleagues and began to include them in the family centered care instead of rising above them to their supervisors. However, with conflict, the nurses noted that the questions were surrounding active listening to all members, considering ideas, and addressing team conflict and they determined this was based on an individual basis that was either supported or made worse by the

support offered by the organization and role models by supervisors. Therefore, they did not see the increase of one as a connection to the other as the variability for them was based on the situation and how the conflict or family conversation was happening. According to Mead's concept of role theory, nurses act out their defined roles, and their behaviors are context specific based on social position and other factors. In this context, the division of responsibilities with patient care depends on the interaction, guided by social norms, and that changing conditions and social pressures are likely to lead to role change. Therefore, nurses must still care for the patient task list regardless of the level of communication between providers and any conflict that may be present (Siegrist, 2015).

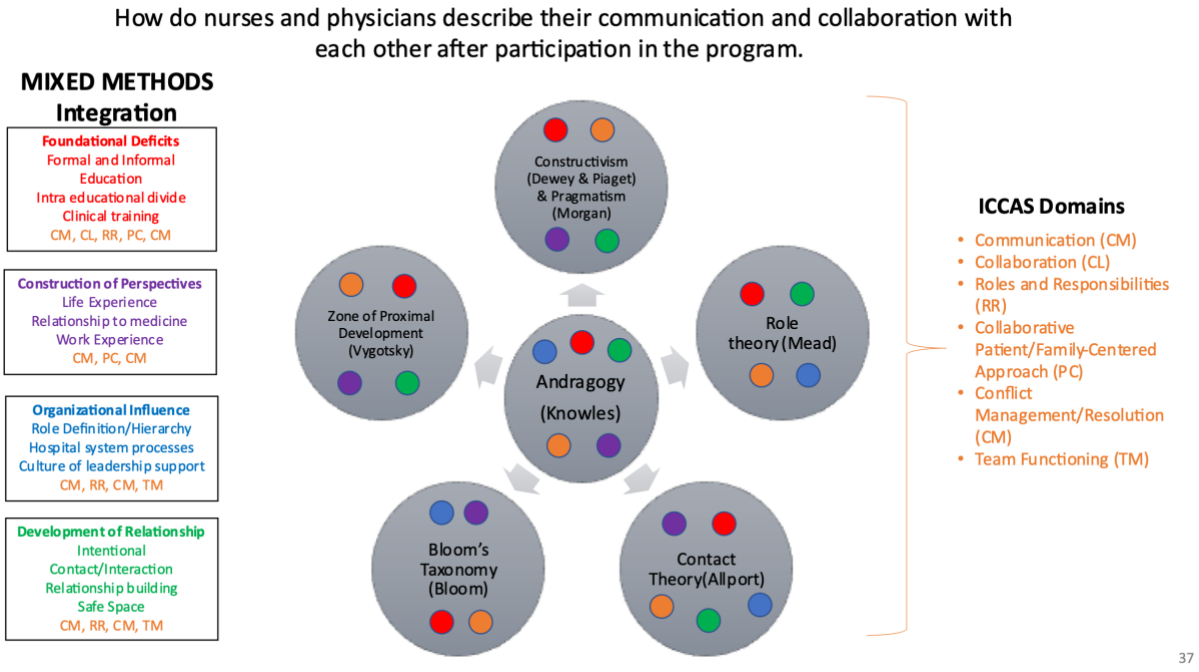
The results for the physician role showed a strong, positive correlation between all six variables with high levels of physicians' perceived associations between each domain. Finally, the results for the participants as a group showed a strong, positive correlation between all six variables with high levels of perceived associations between each domain of communication, collaboration, roles and responsibilities, collaborative patient-family centered approach, conflict management/resolution, and team functioning from both roles when analyzed together. This was supported through interviews highlighting that when the comfort level and trust a parent and patient have with either the nurse or the physician gets compromised, the issues fall directly on the whole team and their failing skills. The participants noted that patients are watching every aspect of their care as they are in a vulnerable situation with their children and if they see a poor dynamic, they will immediately begin to lose trust in the entire team. Therefore, the participants realized that all domains are important and with the improvement to one area, other areas can also improve.

**Mixed Methods Summary**

By utilizing a mixed methods approach to answer the overall research aim ("How do nurses and physicians describe their communication and collaboration with each other after participation in the program"), the data were able to gain a richness in context that might otherwise be missing if I had only used numeric analysis. Figure 8 shows the mixed methods integration between paradigms, intervention-based theories, and qualitative themes that were found to be either a barrier or pathway to communication and collaboration and the ICCASr domains framework found in the survey. As supported through the interview themes, constructivism is an approach to learning that holds that people actively construct or make their own knowledge and that reality is determined by the learner's experiences. Pragmatism is how we deal with issues or situations using practical approaches and solutions that work in practice. Andragogy looks to learning theories best utilized by adult learners to support the creation of meaning that is personally constructed through experience, and how that meaning is influenced by the interaction of prior knowledge and new events. Additionally, these adult learning theories support the emphasis that pragmatism places on shared meanings between learners or groups as bringing learners together in real time allows them to learn from each other to broaden perspectives. The study showed that the relationship between these two roles begins with the directed interaction between them to build their ability, not simply to add to their knowledge. This integration highlights the inclusion of all theories above as needed to effectively develop an IPE curriculum, teach IPE to adult learners, assess all facets of IPE competency, and implement IPE competencies throughout all stages of education and practice.

**Figure 8**

*Qualitative Research Question Analysis*




Mixed methods allowed for exploration of meaning behind the quantitative results using qualitative methods developed to provide a path for participants to use their own voice and share their experience. As with the aim of the study, utilizing mixed methods combined two approaches of research to work towards answering how participation in the program impacted the ability to collaborate and communicate with teams once in practice and how those skills applied to patient care.

## Connection to Theory

Patricia Leavy (2017) stated that using a "mixed methods paradigm is extremely diverse methodologically and theoretically" (2017, p. 164). Using this research method allowed the study to be problem centered with the ability to utilize varying assumptions to guide the

quantitative and qualitative approaches. Greene (2008) noted that mixed methods allow for "multiple legitimate approaches to social inquiry" to be utilized in developing the research study as this type of thinking values multiple standpoint approaches that allow the research to embrace "multiple ways of seeing and hearing" the world as equally important and valuable (p. 168). Therefore, unlike the traditional use of a single methodology driven by theory or conceptual frameworks, mixed methods "is not committed to a particular philosophical belief system and corresponding sets of theoretical frameworks" (Greene, 2008, p. 169). Therefore, this study falls under the overarching lens of pragmatism, which allowed me to use utility and determine what worked best in the context of the specific research aim and questions. Additionally, using a pragmatist approach allowed the research to hold "no allegiance to a particular set of rules or theories" but I instead utilized multiple tools to frame the study itself (Leavy, 2017, p. 168). Given this open parameter, the research met the major criteria for mixed methods in that the design was "practical, contextually responsive and consequential" to the field of study (Datta, 1997, p. 3, as cited in Leavy, 2017). Given this foundation, the research question stood at the center of the study, which was action driven as a response to a gap in the literature to explore the nurse–physician relationship. I focused on the response to an intervention and utilized both inductive and deductive methods to go beyond answering a question, instead offering insight into the entire issue being studied.

**Essential Intervention Theoretical Development**

The study design used mixed methods concepts, looking at the research question responses to provide insight into behavioral change; however, the design and theoretical underpinnings of the intervention itself drove the learning outcomes and should be explored as pivotal to the study conclusions. The program was built using adult learning theory by adhering

to the four principles of andragogy to ensure the learner was involved in the education plan and their preferred instruction. The program offered learners' real and lived experiences to guide the learning activities, ensured that all didactics and activities were immediately relevant to the learner's job, and all of the materials used for instruction and reflection were focused on the need to reduce conflict between the two roles to ensure they were prepared to enter practice as a team (Knowles, 1970).

The IPEC framework (developed in 2011, updated in 2016, based on IPE concepts, and supported by the WHO) was noted as a necessary part in the learning process of collaborative healthcare teams. The IPEC framework includes four competencies and values/ethics for interprofessional practice. This framework speaks to working with other professions to maintain shared values and mutual respect for varying roles and responsibilities using the knowledge of one's role and the other to assess and address patient needs while advancing a population's health and interprofessional communication. Interprofessional communication regards the ability to responsibly communicate with professionals and patients to support a team approach to health maintenance, prevention and treatment of disease, and teamwork. This ability is built on a foundation of applying relationship-building principles and values of teamwork to understand the different roles and their responsibilities towards planning, evaluating, and delivering safe and equitable care (IPEC, 2020). The goal of the competencies is to meet desired principles by creating programs that link learning objectives, activities, instruction, and behavioral assessment appropriate to the learner with the ultimate ability to be integrated into the current learning schematic and applied across professions and settings. The intervention examined in this study used the IPEC framework to build its own learning objectives with the goal of meeting these vetted national competencies in mind.

The learner objectives also used Bloom's taxonomy as a scaffolded approach to developing knowledge, comprehension, application, analysis, synthesis, and evaluation. The intervention curriculum integrated instructional design principles guided by learning theories for adult learning and instructional activities that focus on interaction, communication, and teamwork processes. The learning activities were introduced at the formative stages across the curriculum. Each activity is built upon the curriculum as a mechanism of offering a discussion and real-time application. These activities were supported by debriefing opportunities with trained facilitators (providers from different health professions and educational backgrounds) to promote students' reflections on learning. Several of the activities were noted as impactful to growth during the interview phase, specifically, the clinical view activity, top 10 list, and quality improvement project.

Kirkpatrick's model was employed as an assessment model and tool to evaluate the intervention program's effectiveness by reviewing the first three levels (reaction, learning, and behavior) as part of the pre-studies.

Therefore, when reflecting on the theoretical foundations of the program's development, there was a need to locate an applicable tool for assessment. For the quantitative portion of the study, a vetted survey instrument was selected given its precedent for an accurate evaluation of perceived abilities in the domains specific to IPE programming. As noted, the IPE framework was developed in 2009 by a consortium of national associations of schools representing multiple healthcare fields of study, and by 2010, the WHO "defined IPE and developed a framework for action on IPE and collaborative practice when students from two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes" (van Diggele et al., 2020, p. 1). A partner to the IPEC, the CIHC framework led the development

of the ICCASr survey by utilizing the same domains founded in the IPEC framework as the testable variables: role clarification, team functioning, interprofessional communication, patient/client/family/community-centered care, interprofessional conflict resolution, and collaborative leadership. IPE competencies from the CIHC framework and IPEC were used to develop and integrate knowledge, skills, attitudes, and values that support collaborative practice (CIHC, 2010). The CIHC was modeled from this same framework, which assisted in the selection of an assessment tool, the ICCASr survey, to test the intervention in this study as it measured the same competencies of learning as taught in the program objectives.

The qualitative portion of the study design followed a mix of pragmatic and constructivist paradigms working to determine "how people engage in process of constructing and reconstructing meaning through daily interactions" using interview questions specifically focused on participants' stories and experiences (Leavy, 2017, p. 129). Included in this overarching paradigm are several learning theories that aided in supporting the importance in intervention program design.

**Allport's Intergroup Contact Hypothesis**

This study highlighted Gordon Allport's (1954) contact theory in that current formal and informal education lacks IPE programming as today's programs do not require human contact as part of the intervention but instead utilize simulation and online modules as preferred. The contact hypothesis suggests that interpersonal contact between groups can reduce prejudice, and this was seen prevalently throughout the qualitative portion of the study as highlighted with participants' narratives on the simple fact that being in the same room removed many preconceived notions of the other. According to Allport, who first proposed the theory, four conditions are necessary to reduce prejudice and allow teams to work towards equal status,

common goals, cooperation, and institutional support. The current issue being reviewed is that nurses and doctors do not learn together and only begin their relationship upon entering the clinical setting at different levels of preparedness in work skills. The interviews provided support that IPE from the physician and nurse perspective should include in-person contact hours to remove previous bias, create new perceptions to equal the roles, develop common goals towards patient care, learn to work together to meet those goals, and have wide-scale institutional support to continue collaborative work. All these foundations are noted in the IPEC framework but lack comprehensive inclusion in the minimal programs found in the literature. However, the intervention in this study utilized this hypothesis of connection and contact when developing activities to grow relationships and remove bias.

**Role Theory**

Physicians and nurses professionally have a place and corresponding role in the structure of healthcare and those roles have their own equal set of expectations and behaviors that have been socially determined but often lead to conflict. The impact of this IPE intervention was the inclusion of a discussion of predefined roles in healthcare, what responsibilities those roles are expected to perform, and how to update the expectations as needed. As noted by the participants and the literature, each role has a set of rights, duties, expectations, norms, and behaviors that a person must face and fulfill and if those are not clear to all team members then a lack of mutual respect can and will ensue. This type of learning cannot be gained through simulation, modules, or 1-day events as it is a process of meaning-making that only a well-developed IPE program can address. The participants spoke directly to the impact of learning about each other's educational journey, purpose for profession, and expected roles in the clinical unit. The nurses offered their growth in now seeing the young trainee as entering the floor fearful, competitive by nature, and

under the supervision of multiple people, keeping them from expressing their fears, needing to behave as if they are in charge, and having the inability to make decisions alone. This perspective changed how the nurses viewed the entering physicians but also how they would later approach them collaboratively by acknowledging the fear and ensuring the tasks being requested were in the young learner's purview. The physicians noted they were unaware of the nurses' skill sets or multiple responsibilities, believing the nurses were in some capacity there to serve the physicians' orders. The program allowed the young physicians to see the nurses as intellectual equals having the same ability to manage care and direct needs if the care plan changed. However, they also learned that nurses work to execute the orders of multiple people and spend longer in the patient room to provide care and build relationships. Given these varying responsibilities, the physicians learned the role of the nurse in relation to their own and worked on face-to-face communication of important needs as a far more effective path in executing patient care.

**Zone of Proximal Development**

IPEC competencies rely on interaction as part of the learning process; however, this type of learning can only be facilitated through guidance and support. The zone of proximal development theory states that the learner moves from potential to actual development and highlights the importance of social interactions to progress the learner. IPE education must include real interactions in the real setting beyond that of workshops, didactics, and simulations. The intervention in this study had a heavy focus on social interactions outside of the clinical care setting, away from stressful patient care scenarios, and in a safe environment. The activities that were developed had a sense of building community above career and allowed the participants to

ask questions, get to know each other as humans, and in turn grow a bond that then translated to the care setting.

## Literature Related to Findings

Several studies have examined perceptions of physician and nurse communication, patient handover and management, and the healthcare provider and patient, albeit they were by and large based on the conflict that arises from lacking ability. However, the literature is severely lacking on programs used to preventatively facilitate collaboration and educate these two roles (together) on communication techniques in developing the necessary job skills to provide transparent care and improve their working relationships.

## Communication

The literature points to the importance of communication being the relationship between giver and receiver, which, although alluded to in the IPE framework, is still not addressed in the competencies for healthcare training (Martin, 2011, p. 1569). As noted throughout the study, if physicians and nurses are not given the opportunity to build this important relationship, their communication is driven by their own implicit bias and the communication skills they bring into the workforce could lead to conflict. For example, communication of patient information is expected between nurses and physicians to provide safe care management, but this does not always occur. Patient safety is the most crucial component of healthcare management, and failed communication can lead to poor patient outcomes for families and the organization (Wang et al., 2018). As noted in Chapter 5, the lack of communication training acts as a barrier to ensuring closed-loop communication occurs in the hospital unit. As several participants noted, the intern often enters the unit without an understanding of the nurse's patient-facing role and the various tasks they must complete to ensure care plans are executed. In the study, it was shown that one of

the intervention activities, the shared EMR screen, offered insight into the single largest barrier to communicating patient care needs and that is that neither side sees the same items on their order screens. Once they had the opportunity to see the other's perspective, they were able to understand when it was best to have a face-to-face huddle, pick up the phone to call, or even send a message through the EMR system for clarification. One of the most common barriers that lead to poor communication practices, as noted in the literature, is the normative structure of hierarchy found in healthcare teams that reinforces the physician as the dominant caregiver and the nurse as a supportive role (Matziou et al., 2014). This top-down approach to medicine works directly against the comprehensive health model, as no one person holds all the necessary medical knowledge, nor can one person manage the numerous needs of a single patient, much less an entire unit (Fagin, 1992). This dyad hierarchy has been discussed since the seminal work, *The Doctor–Nurse Game Revisited* (Stein et al., 1990), which reviewed the nurse and physician relationship's history and continued perpetuation of physician dominance. However, it seems that even with the inception of the IPE framework, the hierarchical model still exists in U.S. hospitals. The top-down approach is led by broken systems that rely on having a "person in charge" or a final decision maker even though patient care is a team sport. By way of noting that the physician is in charge immediately sends the message to nursing staff that they are there for support and not leadership in the care team. This study recognized that changes are occurring within the hierarchical structure regarding team learning, but the top-down approach is led by the organization and often not in the hands of the providers. There has been positive forward movement since the work of Stein et al. (1990), but the topic of interprofessional team care still has a way to go to become a part of the culture of medicine. Finally, to effectively communicate, it is necessary to allow all team members to have ownership of information and a pathway to

share the information without fear of retaliation in a streamlined capacity (Rice et al., 2010). This conflict arises often in an intern presuming to know the patient's needs by using book knowledge without a foundational set of experiences to justify or support their decision making. When the intern enters the clinical space with ego over knowledge, they often do not include the nursing staff as decision makers, in turn leading to conflict as the nurse is the role that executes the decisions into practice. This study offers insights to the nurses as to the fear the intern is bringing into the unit given their self-known lack of job and clinical skills yet having to look like they know what they are doing. The physicians realized how frightening July 1st was for nurses as they have the experience and skills to execute care but must now teach the incoming physicians. This realization occurred during the intervention through journaling and discussion and helped both roles see the importance of recognizing each other as humans above titles or roles so these fears can be recognized, communication can be facilitated, and conflict can be reduced.

**Roles and Responsibilities**

Given the lack of understanding by team members regarding their role, function, and potential for collaboration with other team members, silos are found on the clinical floor (Fagin, 1992). The nurse and physician team membership is slated for the physician as the primary role, leaving shared decision making as a one-sided endeavor resulting in skewed perceptions of collaboration among the team. As shown throughout the study, the lack of knowing what the other role entails immediately places a barrier to understanding. The clarification of roles and responsibilities allowed the intern participants to better understand their position on the care team and how to best utilize the expertise of their nurse counterparts. The understanding by the nurses that interns arrive without the skill ability to execute their own responsibilities given their lack of experience allowed the nurses to offer more patience and grace during the decision-

making processes. Over the last several decades, there has been a change in doctors' and nurses' roles given the increased focus on patient care and the healthcare system's advanced complexity (Voyer, 2013). When positions are clearly defined and the relationship expectations between the nurse and physician are communicated, the care provided improves and creates a higher level of professional satisfaction (Matziou et al., 2014). The sharing of information from nurse to physician is seen as the advocacy of patient needs; however, physicians often do not reciprocate that information sharing, instead choosing to work in silos (Nair et al., 2012). This intervention, as highlighted by the study, provided mechanisms to learn roles, responsibilities, and barriers that may lead to poor collaboration. One activity result was when the teams realized they do not see the same screen on an EMR, which led to the discussion of information not being withheld but instead just not seen. Therefore, the activity led to an improved process of flagging the important information in a way where both parties could see and discuss when to pick up the phone to call for immediate needs.

**Collaboration and IPE**

Healthcare education is taught linearly and lacks consideration of individuals' exposures to and lived experiences with the other. Communicative action focuses on the transmission and renewing of cultural knowledge with the aim that this process will create mutual understanding that leads to team behaviors seen through collaboration. Through the process of communicative action, there is an overreaching goal towards developing social unity and integrating each team member. The relationships between physicians and nurses are expected to be functional and positive but medical school does not adequately teach the skills necessary to build those relationships. During medical school in the United States, the curriculum is heavily focused on theoretical concepts and process mechanisms for disease profiles and anatomical systems

(Matziou et al., 2014). Nursing school is also heavily focused on theory; however, nurses enter the clinical environment much sooner than their medical counterparts and are taught using task lists and forecasting as part of their professional practice (American Association of Colleges of Nursing, 2018). In addition to medical schools, GME has an intended collaboration mission. However, it has not made forward progress on developing a standard curriculum that reinforces the applicability of collaborative skills such as effective communication and role definition, specifically between the nurse and physician-in-training. There is currently no information available supporting that interprofessional communication, role definition, or collaborative behaviors with nurses are required to be taught during the formal education of physicians in the United States (Shafran et al., 2015). Rather, the two most fundamental team members are kept siloed, isolated, and often pitted against one another based on organizational culture and archaic hidden curriculum even though education has evolved into social medicine, requiring the inclusion of multiple roles and experts (Formosa, 2015). Many collaborative job skills are learned postformal education and embedded inside each hospital culture's complex system. The collaborative aspects of healthcare team members are primarily driven by the organizational culture and are not uniform across all care settings. The study found that current research does not offer a shared definition of collaboration by both groups and recommends organizations provide opportunities for supporting IPE by creating workshops, open forums, and training programs that directly focus on developing respect, collaborative skills, and working relationships given the lack of formal education (Nair et al., 2012, p. 119).

As noted in the literature, in 2009, representatives from six national associations of nursing, medicine, dentistry, osteopathic medicine, pharmacy, and schools' public health formed a collaborative (IPEC). Canadian counterparts created a similar structure (CIHC) to promote and

support interprofessional learning. Competencies, frameworks, and assessment tools have now been created to facilitate programming in all facets of healthcare education and practice, as supported through multiple studies, including this one, and summarized by researcher Brenda Zierler in her blog (2019):

> We know from the literature that communication breakdowns within and across teams contribute to medical error and harm. Health professionals are trained in silos and expected to know about other professions when they start practicing. They are not trained to practice in teams, nor do they know enough about what each profession knows or what they can contribute to the medical and social care of the patient/population. This lack of knowledge about each other and the lack of mutual respect for professions outside of their own leads to team communication failures and the lack of collaboration. The most recent literature has demonstrated that improved communication and collaboration of interprofessional teams leads to better delivery and access to care.

There is ample literature on the IPEC competencies' development and initial uses in varied settings, but the literature still lacks studies on the longitudinal effects of a well-developed adult-centered IPE intervention in GME, specifically between these two roles. Additionally, this is the first study to examine the impact and long-term effects of an IPE intervention program focused on providers-in-training and their nurse counterpart's ability to communicate and collaborate once they enter the workplace. This study supported the gaps found in the literature review and, in its conclusion, adds to the larger body of knowledge on the topic of standardized IPE programs in GME.

The study revealed the following four essential thematic interpretations: foundational deficits, construction of perspectives, development of relationship and organizational influence. Each essential thematic interpretation was influenced through the discovery of categories found through coding data obtained from the participants' interviews. The categories of formal education, intra-educational divide, and informal education/clinical training influenced the essential theme of foundational deficits. The three categories of life experience, relationship to medicine, and work experience influenced the essential theme of construction of perspectives.

The three categories of intentional contact/interaction, relationship building, and safe space influenced the essential theme of development of relationship. The three categories of role definition/hierarchy, hospital system processes, and culture of leadership support influenced the essential theme of organizational influence.

These themes highlight the areas not identified in much of the IPE literature that are more focused on the curriculum possibilities and intended results of improved patient care. Although patient care is the primary goal in healthcare, providers must be prepared to provide that care at the highest levels. These themes showed that the functional deficits in healthcare provider education and training sets the trend for later professional conflict as they enter their profession unprepared and either gain proper knowledge through random mentorship or perpetuate the same historic issues in failed team membership as seen over time in the literature. Next, the construction of perspectives is not discussed in the IPE literature as learners are spoken to as if they all begin their learning and careers in the same starting point without individual history or experience. This failure to acknowledge the provider as a human negates many of the strengths they can bring to the team and fails to recognize their weaknesses that can be targeted for improvement. The concept of developing relationships is the foundation of IPE; however, the curriculum is heavy on the areas of lecture and simulation, which remove the ability for these roles to truly connect in a more authentic and organic way to learn about each other as people and build a context of understanding and empathy during times of stress. Finally, organizational influence is also spoken about in the IPE literature as a need for hospitals to recognize the importance of team-based care and develop programs for their employees. However, there is no accountability or reward for them to do as such, and in the business of healthcare, allocating dollars to make people work better has not been a goal of this framework unless it is driven by

direct patient satisfaction scores. Meaning the desire to make employees better equipped to work, happier to belong, and more prepared to handle high-stress environments—in turn reducing burnout and turnover—is not as important as a hefty bottom line.

**Conclusion**

At the conclusion of the study, it was determined that the ICCASr is an effective tool for IPE intervention assessment in identifying perceived changes in behavior as it relates to interprofessional programming even years after an intervention. The statistical improvement identified between pre and postlearning surveys supported the effectiveness of this specific program to provide IPE knowledge long-term using IPE competencies. The deficit in IPE training in formal healthcare education created the most significant barrier to providing team care. IPE interventions should fill these gaps by providing the necessary job-related soft skills to ensure the positive collaboration between roles in the clinical care setting. The qualitative insights revealed areas needing attention when developing future IPE programs such as moving away from modules and simulation and towards the implementation of standard programs for all learners using adult learning theory models. To ensure these IPE interventions are supported in their implementation, there should be an increase of accountability by accrediting bodies to ensure schools and training programs are actively embedding this material into the current curriculum. Intervention activities should provide a pathway for participants to reflect on their own paradigms as they learn to see the “other” as a human instead of a role, which has not previously been role modeled but will change practice approaches. To truly support IPE education in the clinical care setting, there must be organizational support to maintain positive relationships and build trust among employees. Mixed methods designs are a novel approach to healthcare education research and provide a deeper dive into learners’ lived experiences and

shared meanings. Mixed methods thinking values multiple standpoint approaches that allow the research to embrace "multiple ways of seeing and hearing" the world as equally important and valuable. This study supports the importance of developing a standard IPE curriculum using interactive, relationship-driven activities as a meaningful and necessary part of training to preventatively reduce conflict and proactively develop effective IP communication and collaboration skills to meet healthcare organization and patient needs once in practice. Given that no other study has assessed the impact of a longitudinal IPE intervention between physicians-in-training and nurses, the results are meaningful for healthcare education. Next, I present my recommendations on how to meet the needs of learners and adhere to the study findings using a modified learning model.

**Implications**

The study provided support that the IPEC competency is sufficient in creating the objectives for an IPE program and that the ICCASr is effective in assessing the behavioral perceptions pre and postintervention. However, the largest implications from the study findings are the need to develop a robust program and interactive instruction that is adult-learner focused, utilize these programs as a standard in all training programs, and continue to support that learning once they enter the organizational setting. These items, all spoken to in some capacity in the literature, have yet to be implemented or studied longitudinally, specifically between physicians-in-training and nurses. Therefore, an updated curricular framework generated from the integrated mixed methods findings should be created, implemented, and assessed in all training programs with the secondary accountability from accrediting bodies to place the same level of importance on IPE competencies as placed on clinical acumen and physiologic theory. The current IPE model has established competencies, offered insights into sustainability, and

provided tools for assessment depending on outcomes of course offerings. Where the Interprofessional Learning Continuum (IPLC) Model fails to be effective is where the implementation of programming in the early years of healthcare education should be mandatory as part of the curriculum. This could be related to the education of the instructors as few faculty in medical school, nursing school, and clinical residency have degrees or training in higher education, instruction, or adult learning. Additionally, the training fails to move into the GME curriculum or standards set by the ACGME. Finally, the use of a vetted program has yet to be implemented across the spectrum with 1-day workshops, one-time simulations, and online modules continuing to be used as a check box for completion. The intervention in this study used the foundations of adult learning theory to create a program supported by IPE competencies to ensure the comprehensive transfer of learning and a vetted assessment for determining the program's continuous improvement based on learners' reactions and needs. The intervention's largest impact has been its sustainability over the course of 9 years with proven effectiveness in the long-term retention of skills in communication, collaboration, role development, and team-based patient care. Bringing learners together for a single day is not effective IPE development. Simulation is a widely used practice to identify needs or assess competencies in a one-time endeavor but does not offer a true assessment of growth in the soft skills that are the foundation of IPE. Healthcare teams must be brought together in real time to grow their relationships, gain an understanding of the other, discuss topics in a safe environment, learn skills that are relevant to their current practice, and have an opportunity to reflect on their own perceptions to grow as professionals and team members. The intervention in this study brought together learners for a year to grow socially, formally, and informally through vetted activities; create projects that are meaningful to their practice; and share ideas and experiences to gain a depth in their relationship.

Although these learners may or may not work together in future years, they were given the tools and skills necessary to take what they have learned to any job and teach those around them how to be successful in collaboration and effective communication. There is a widely accepted belief that doctors know how to communicate with interprofessional team members, but there is no basis for that assumption. Doctors do not enter medical school with advanced degrees in communication; there is no testing to determine their current communication ability and there is typically no formal training on IPE-based communication while in medical school. Furthermore, doctors graduate and enter residency under the same set of assumptions, expected "to know" how to work on IPE teams. Although communication is a core competency throughout a provider's educational journey, there are no formal/standard curriculum that must be taken and passed nor are there any consequences for not becoming effective in this job skill.

This study provided insight into participants' practice habits and how the negative effects of poor practice habits can generate issues with patient care. It also offered a glimpse into the positive effects mutual respect in decision making can have on improving team-based care from training to practice. Given that there are no standard IPE requirements or curriculum in formal education or training provides a rationale as to the increased issues found on the clinical unit in the domains identified, leading to poor patient care, broken teams, poor communication, and a hierarchical culture. As noted in the study, it takes the buy-in of all stakeholders, from educators to hospital leadership, to reinforce and sustain the importance of high-functioning teams, thus removing the caste system. Instead of utilizing buzz words, 1-day trainings in the face of conflict, or a total void in IPE, this study showed that a cultural change must happen to build trust among employees, continuously support learning between professional roles, and ultimately provide excellent team-based patient care with the skills provided and leadership shown.

As noted in the literature and found through this study, IPE competencies are developmental processes, and learning between professional roles follows the learning continuum and must be started early, reinforced repeatedly, and placed at the same level of importance as all other facets of healthcare education and management. This means the curriculum should be created with the learners' levels in mind and work them towards the concepts of lifelong learning by scaffolding the curriculum and activities at the pace of the learners' experiences. The focus of IPE programming should address the learners' previous experiences with healthcare teams and structures, where the learner is in their education and addressing the everchanging landscape of healthcare to grow skills in teamwork, communication, and collaborative care. The study showed that the IPEC and CIHC frameworks are applicable to social policy, research, higher education, and clinical practice.

Another implication from the study was the development of professional identity and communication formation seen pre, during, and postintervention. The "ah-ha" moment was when the participants realized they are human regardless of their professional role, the healthcare system is not "them vs. us," both roles lacked a shared understanding of individual responsibility, they all had fears stemming from the unknown, and they shared the goal of patient care. Ensuring the health of patients is a stressful, unpredictable, and complex process that adds a level of intensity not seen in many other professions. Therefore, when the patient is the goal, the protectiveness of care provided is seen. The program allowed for true contact and relational building to take place, and over the course of a year and into years postintervention, the experience removed those implicit biases, allowed participants to build teams more effectively, and removed much of the patient-generated stress so trust began to form between the roles. This expanded the professional identity from "I'm the doctor and I'm in charge" to "I'm the doctor

and I need a team to provide the best care possible." There was also the realization that no one person has all the answers and that the inclusion of others using effective communication built a community instead of a shift team.

An implication found during the analysis process was the future training of professionals not in formal education and clinical residency. The concept of IPE in formal education has only been a topic since 2011 and is still lacking full implementation across the country. However, there is now a generation of providers who have had some interaction with the term IPE through a lecture, article, or 1-day experience. However, the increase seen in formal education since 2017 still leaves four generations in the workplace with zero IPE education. This means that training from the top down is going to be crucial for the creation of truly collaborative teams as well as the ability to communicate both effectively and with generational appropriateness. Therefore, in addition to ensuring there are properly developed curricula and activities in the early years, there is also a need to educate current providers to ensure IPE is role modeled from the clinical floor, taught by faculty, and ultimately supported by hospitals and organizations. Building genuine relationships will require more than a 1-day course, single simulation, or 1-hr lecture to check a box; it requires building genuine understanding, trust, and respect as noted in the intervention from the study. This intervention allowed the participants during the program and over the course of several years to see each other as people, understand roles/purpose, realize how to work together, remove fear of failure, understand the education each receives, and utilize that knowledge to build IPE teams to provide the best possible patient care. This program could act as a catalyst for integrated programming for practicing providers as it already requires participation by currently practicing nurses and seasoned faculty alongside new interns.

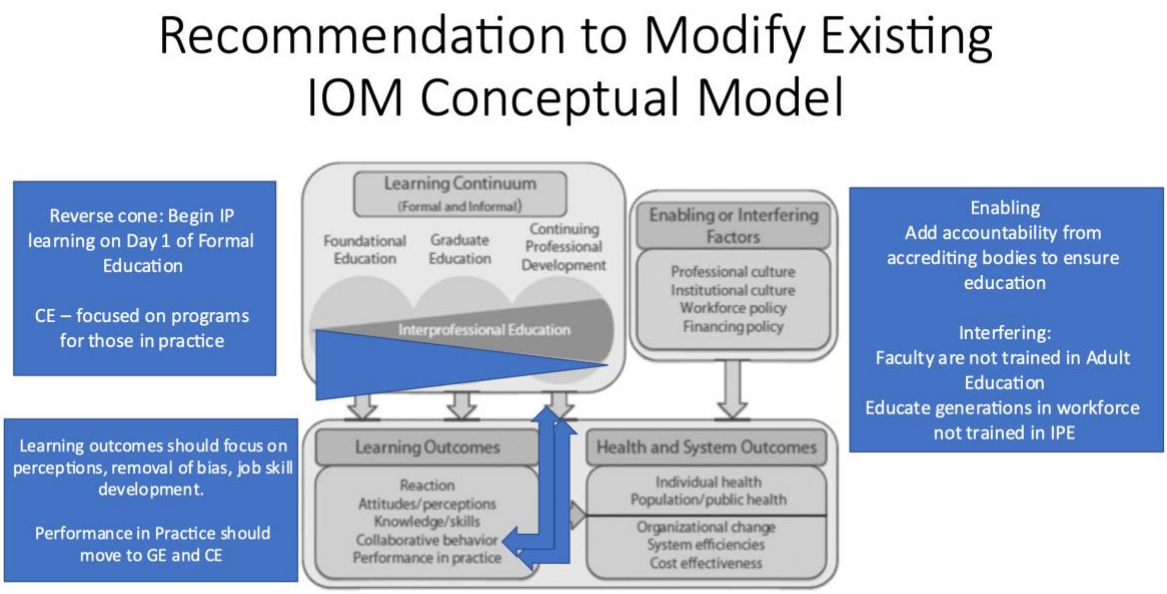
Fundamentally, GME lacks the inclusion of adult learning theory to include learning that is grounded in real-life practice, including the teaching of IPE with physicians-in-training and their nurse counterparts. Residents via culture are still regarded as students and not employees needing development in job-related skills and team dynamics. GME continues to focus on arbitrary assessments to meet a numeric goal to deem physicians as competent, yet there are few assessments on work preparedness to be successful in practice outside distinct medical knowledge. Knowledge without application is simply rote information. Even today, programs focused on communication are built around assessments in simulation, group evaluation such as committee meetings, and self-assessment often without team inclusion. There is still a hidden curriculum perpetuating the belief that the physician is the lone person in charge and decisions are top down. This intervention allowed participant learning while in GME to change that perception, offer the necessary job-related skills, bring roles together to learn how to effectively communicate, and address the social aspects of team care.

The study provided my recommendation to modify the existing Institute of Medicine conceptual model for IP learning (see Figure 9) (Institute of Medicine, 2015). My recommendation is to reverse the learning cone to begin foundational education with directed, interactive, and adult-theory-based education to instill the proper foundation as equally important as clinical theory in medical and nursing school. The fundamental part missing in IPE is the relationship building, changing of perspectives, creation of job skills, and removal of bias, which should be addressed in the learning outcomes. Additionally, performance in practice should move to graduate education and continuing professional development to allow relevant information for groups in the clinical setting of collaboration and patient care where information is scaffolded but both roles are still learning together. The enabling factor should now include

accountability from accrediting bodies to ensure IPE is placed at a higher level of importance in the curriculum, interfering factors should include that most medical educators are not trained in adult education and should be given those skills, and that CE will remain important as there are four generations of providers already in the workforce who have had no exposure to IPE.

**Figure 9**

*Recommendation to Modify Existing Interprofessional Learning Continuum (IPLC) Model (IOM, 2015)*




*Note*. From "Measuring the impact of interprofessional education on collaborative practice and patient outcomes" (https://nap.nationalacademies.org/resource/21726/IPE_RAAG.pdf). Copyright 2015 by the National Academy of Sciences. Reprinted with permission from the National Academies Press.

## Implications of Recommendation

The implications of my recommendations are generated from the study findings and speak directly to the impact the intervention had on my participants. There is a need to develop a robust program with interactive instruction that is adult-learner focused as a standard in all training programs as well as continued support as providers enter the organizational setting. IPE should be preventative not defensive. If formal education and clinical training implemented

programs using adult theory instead of modules and simulations, then teaching the IPEC competencies could support the construction of perspectives and building of relationships, mitigating possible later conflict. If the IOM (2015) model's learning continuum cone was reversed, then healthcare provider students could gain necessary skills earlier during formal education to build upon in the clinical years instead of starting from zero once in practice. Many courses in nursing and medical school are similar and could be used as a mechanism to literally learn together through case study and discussion beginning on Day 1. If you wait until GE or CE, you have already allowed poor role modeling and siloed education to perpetuate the culture of hierarchy and leave learners to struggle to catch up in the professional years, or you leave this type of education in the hands of hospitals and not educators.

If the learning outcomes moved performance and collaboration into the GME and CE sections, then it would allow proper scaffolding in relevant time for adult learners to experience clinical collaboration with the necessary skills and knowledge but with already developed relationships. Once relationships are built and roles are discussed while learning together, the initial barriers identified in the study become foundational and not a hindrance. By moving this section, learning outcomes could develop beyond Kirkpatrick after Year 1 and begin to assess behavioral change.

In looking at the enabling and interfering factors, currently the largest barrier is a lacking skill for incoming employees requiring the funnel to be heavy in the CE section. Here several items would need to take place. First, educators should have training in adult learning theory to ensure proper programming. Next, there must be added accountability from accrediting bodies to ensure education was occurring in the formal and clinical years with IPE placed at a higher level of importance. Finally, the current IOM (2015) model, alongside the updated version, must be

utilized for the next several years to allow for IPE programs to fill gaps in the four generations already in practice to provide better role modeling. It will be important to train from the top down as well as the bottom up to improve role modeling and to act as a catalyst for culture changes to show the true importance in these roles.

In looking at health and systems outcomes, if formal and graduate education ensured IPE of all learners, then education would prepare the employee with job skills prior to service. The cost is then reduced at the system level, removing the burden by hospitals to provide training or manage costly issues such as turnover.

**Recommendations for Future Research**

This study supported the issues with this dyad found in the literature, my observations, and the national conversation on the need for IPE training throughout healthcare. As a result of the study findings, I recommend the following areas for future research.

Considering this study is the first of its kind to assess the impact of a longitudinal IPE intervention between physicians-in-training and nurses, future research may benefit from conducting a repeat study with a larger sample size to include all cohorts of the intervention to determine if there are similarities or differences in results utilizing the same demographics and research design. I plan to complete a second study to look at all 9 years of participants and the inclusion of the shadow experience as a part of the outcomes.

Findings from this study lend themselves to utilize the ICCASr survey tool as a vetted assessment to be used as a metric for any current IPE programs to determine the perceptions on longitudinal long-term effects of IPE that have yet to be studied. There is a need for an effective assessment tool to determine outcomes and this study showed that the ICCASr was able to capture perceptions and outcomes based on the domains of IPE.

Finally, I recommend that the intervention used in this study be taken to multi-institutions and other specialties to determine if the curriculum and activities are in fact impactful in a generalizable setting for incorporating IPE competencies throughout GME.

**Summary**

This study was novel in its use of a mixed methods design in healthcare education and its focus on studying a well-developed IPE program focused on the physician-in-training and nurse relationship. The outcomes and implications of the study highlight that the IPEC and CIHC frameworks are well developed and useful in the creation of IPE program curriculum. The CIHC based ICCASr survey was noted as being sufficient in exploring the behavioral changes of participants pre and postintervention with improved postintervention outcomes. The study revealed a need for the intervention by identifying that the barriers to communication and collaboration began with the participants' foundational deficits in not receiving any instruction or information on IPE during their formal and clinical education years until their participation in the intervention. Additionally, the participants noted the intervention impacted their construction of perspectives and allowed for a development of relationships through the intervention design, program timing, and meaningful activities focused on creating a path for self and team discovery. Finally, the participants noted that organizational influence functioned as a barrier to transitioning the IPE skills they learned from the program to the care unit as there was a void in supportive programming once in practice. Additionally, the participants shared that the generations above them had never received IPE, making role modeling difficult.

The issue that was identified in the literature was the lack of properly created and executed IPE programs in healthcare education where this study was able to support the use of adult learning theory in conjunction with IPEC competencies to truly develop the relationship

between interprofessional roles and to offer a pathway for reflection and self-development in the areas of IP clinical care. The intervention in this study filled a gap in the literature by highlighting an effective program focused on developing the knowledge, skills, and attitudes necessary to feel confident and competent as a new physician or nurse, work collaboratively, and utilize effective communication to provide effective patient care.

Additionally, the use of mixed methods to dig deeper into the learners' experiences was deemed necessary in utilizing open-ended survey questions to build interview questions for greater depth in context. The results of the survey were positive in that growth was identified between pre and postlearning and the interviews identified that growth was most importantly driven by building relationships between the two roles. The participants' experiences supported the need for IPE as the literature has continued to do but went a step further in highlighting best practices for implementing IPE interventions in the GME training years. Current education for both nurses and physicians heavily rely con packing as much theory as possible into 2–4 years but fails to add any context to said theory. Given this model, there are graduates across the continuum who enter their secondary training or initial practice woefully unprepared to work in a team-based model to provide the highest level of care. The IPEC consortium has identified a theory-based rationale for the integration of IPE into education and has gone as far as to identify the continued need for programming once in practice but has failed to provide realistic mechanisms for implementation on a large scale. Still to date there is little to no accountability for programs to successfully implement required training in the designated domains that through this study were shown to be pivotal in the creation of relationships of the healthcare team. There is no longer a need to determine the need for this important training as ample studies have been done to identify both the recipients' needs and desires. There is no longer a need to determine

which framework or model would work best as this study alone proved the IPEC and CIHC domains are relevant and accurate when looking at the foundation of interprofessional teams. At this point, the focus should be the action behind ensuring these programs begin in the early years of formal education with real-time interactions and relationship building and not lectures and simulations. There is a need to implement required and ACGME-accountability-driven programs at the training level for all physicians preparing to enter the workforce, as well as for all CCNE-accredited nursing programs. Furthermore, it is more than necessary for organizations and hospitals to actively create and mandate training for all levels of physicians and nurses to receive instruction on effective communication, collaboration techniques, and patient care best practices to support the new generation as they enter the workforce. The time for need assessments has come and gone and we are at a place where action is required. This study and its participants have shown that a structured program prior to beginning training not only helped young physicians mentally and emotionally prepare to enter the clinical setting but it reduced the fear and anxiety of seasoned nurses often felt on July 1st. Additionally, the skills they gained through the program helped them build relationships while in training and once they left training they took those skills into their careers and used them to make positive changes in their own institutions. Nurses used the skills they gained to teach other nurses and physicians how to communicate and collaborate more effectively. In turn, although not studied specifically, patient care was improved by the words of the participants as they had more confidence in working as a team and effectively communicating positive and negative news to their counterparts.

# References


Accreditation Council for Graduate Medical Education. (2022, July 1). *ACGME common program requirements (residency).* https://www.acgme.org/globalassets/pfassets/programrequirements/cprresidency_2022v3.pdf.

Accreditation Council for Graduate Medical Education. (2022, July 1). *ACGME common program requirements (residency).* https://www.acgme.org/globalassets/pfassets/programrequirements/cprresidency_2022v3.pdf.

Al Achkar, M., Hanauer, M., Colavecchia, C., & Seehusen, D. A. (2018). Interprofessional education in graduate medical education: survey study of residency program directors. *BMC Medical Education*, *18*(11), 1–5. https://doi.org/10.1186/s12909-017-1104-z

Allenbaugh, J., Corbelli, J., Rack, L., Rubio, D., & Spagnoletti, C. (2019). A brief communication curriculum improves resident and nurse communication skills and patient satisfaction. *Journal of General Internal Medicine*, *34*(7), 1167–1173. https://doi.org/10.1007/s11606-019-04951-6

Allport G. W. (1954b) *The nature of prejudice*. Addison-Wesley

Alzamil, H., & Meo, S. A. (2020). Medical students' readiness and perceptions about interprofessional education: A cross-sectional study. *Pakistan Journal of Medical Sciences*, *36*(4), 693–698. https://doi.org/10.12669/pjms.36.4.2214

American Association of Colleges of Nursing (2022). The essentials of baccalaureate education for professional nursing practice (aacn, 2008). https://www.aacnnursing.org/Portals/42/CCNE/PDF/Standards-Final-2018.pdf

Amudha, P., Hamidah, H., Annamma, K., & Ananth, N. (2018). Effective communication between nurses and doctors: Barriers as perceived by nurses. *Journal of Nursing and Care*, *7(*3). https://doi.10.4172/2167-1168.1000455

Archibald, D., Trumpower, D., & MacDonald, C. (2014). Validation of the interprofessional collaborative competency attainment survey (ICCAS (revised). *Journal of Interprofessional Care*, *28*(6), 553–558. https://doi.org/10.3109/13561820.2014.917407

Arden, A., Kocaqi, S., Wojkowski, D., Uzelli-Yilmaz, S., & Foohey, M. (2022). Building a theoretical model for virtual interprofessional education. *The Association for the Study of Medical Education*, *56*(11), 1105–1113. https://doi.org/10.1111/medu.14867

Arends, R. I. (1998). *Resource handbook. Learning to teach* (4th ed.). McGraw-Hill.

Barr, H. (2009). Interprofessional education as an emerging concept. In P. Bluteau & A. Jackson (Eds.), *Interprofessional education: Making it happen* (pp. 3–23). Palgrave Macmillan.

Bloom, B. S. (1956). *Taxonomy of educational objectives, handbook I: The cognitive domain*. David McKay Co Inc.

Braun, V., & Clarke, V. (2013). *Successful qualitative research: A practical guide for beginners*. Sage.

Canadian Interprofessional Health Collaborative. (2010, February). *National interprofessional competency framework*. Retrieved August 8, 2022, from https://phabc.org/wp-content/uploads/2015/07/CIHC-National-Interprofessional-Competency-Framework.pdf

Chorostecki, C., Van Soren, M., MacMillan, K., Sidani, S., Donald, F., & Reeves, S. (2016). A qualitative study of nurse practitioner promotion of interprofessional are across institutional settings: Perspectives from different healthcare professionals. *International Journal of Nursing Sciences*, *3*(1), 3–10. https://dx.doi.org/10.1016/j.ijnss.2016.02.003

Chun Tie, Y., Birks, M., & Francis, K. (2019). Grounded theory research: A design framework for novice researchers. *SAGE Open Medicine*, *7*. https://doi.org/10.1177/2050312118822927

Commission on Collegiate Nursing Education. (2022). Standards for accreditation of baccalaureate and graduate nursing programs (amended 2018). https://www.aacnnursing.org/Portals/42/CCNE/PDF/Standards-Final-2018.pdf

Crawford, C., Omery, A., & Seago, J. (2012). The challenges of nurse-physician communication; a review of the evidence. *Journal of Nursing Administration*, *42*(12), 548–550. https://doi.10.1097/nna.0b013e318274b4co

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). Sage.

Dewey, J. (1938). *Experience and education*. Collier Books.

El-Hanafy, E. (2018). Nurse physician work-related relationship as perceived by both of them. *Egyptian Nursing Journal*, *15*(2), 188–195. https://doi.org/10.4103/ENJ.ENJ_42_17

Elliott, S. N., Kratochwill, T. R., Littlefield Cook, J., & Travers, J. (2000). *Educational psychology: Effective teaching, effective learning* (3rd ed.). McGraw-Hill College.

Fagin, C. (1992). Collaboration between nurses and physicians: No longer a choice. *Academic Medicine: Journal of the Association of American Medical Colleges*, *67*(5), 295–303. https://doi.10.1097/00001888-199205000-00002

Forbes, T., Larson, K., Scott, E., & Garrison, H. (2020). Getting work done; A grounded theory study of resident physician value of nursing communication. *Journal of Interprofessional Care*, *34*(2), 225–232. https://doi.10.1080/13561820.2019.1631764

Formosa, C. (2015). Understanding power and communication relationships in health settings. *British Journal of Healthcare Management*, *21*(9), 420–424. https://doi.org/10.12968/bjhc.2015.21.9.420

Fransworth, T. J., Seikel, J. A., Hudock, D., & Holst, J. (2015). History and development of interprofessional education. *Journal of Phonetics & Audiology*, *1*(1), 101–106. https://doi.org/10.4172/2471-9455.1000101

Greene, J. (2008). Is mixed methods social inquiry a distinctive methodology? *Journal of Mixed Methods Research*, *2*(1), 7–22. https://doi.org/10.1177/1558689807309969

Grymonpre, R., Ateah, C., Dean, H., Heinonen, T., Holmqvist, M., MacDonald, L., Ready, A., & Wener, P. (2016). Sustainable implementation of interprofessional education using an adoption model framework. *Canadian Journal of Higher Education*, *46*(4), 76–93. https://journals.sfu.ca/cjhe/index.php/cjhe/article/view/186571/pdf

Habermas, J. (1984). *The theory of communicative action, Volume 1: Reason and the rationalization of society* (T. McCarthy, Trans.). Beacon Press.

Harden, R. M. (1998). AMEE guide No. 12. Multiprofessional education: Part 1 – Effective multiprofessional education: A three-dimensional perspective. *Medical Teacher*, *22*(5), 461–467. https://doi.org/10.1080/01421599880472

Health Research Funding. (2017, December 5). *Habermas theory of communicative action explained*. Retrieved October 17, 2021, from https://healthresearchfunding.org/habermas-theory-communicative-action-explained/

Hepp, S., Suter, E., Jackson, K., Deutschlander, S., Makwarimba, E., Jennings, J., & Birmingham, L. (2015). Using an interprofessional competency framework to examine collaborative practice. *Journal of Interprofessional Care*, 29(2), 131–137. https://doi.org/10.3109/13561820.2014.955910

Hitawala, A., Flores, M., Alomari, M., Kumar, S., Padbidri, V., Muthukuru, S., Rahman, S., Alomari, A., Khazaaleh, S., Gopalakrishna, K. V., & Michael, M. (2020). Improving physician-patient and physician-nurse communication and overall satisfaction rates: A quality improvement project. *Cureus*, *12*(4), e7776. https://doi.org/10.7759/cureus.7776

Institute of Medicine. (2015, April). *Measuring the impact of interprofessional education on collaborative practice and patient outcomes*. https://nap.nationalacademies.org/resource/21726/IPE_RAAG.pdf

Interprofessional Education Collaborative. (2020). *Core competencies for interprofessional collaborative practice: 2016 update.* https://nebula.wsimg.com/2f68a39520b03336b41038c370497473?AccessKeyId=DC06780E69ED19E2B3A5&disposition=0&alloworigin=1

Ishak, W. W., Lederer, S., Mandili, C., Nikravesh, R., Seligman, L., Vasa, M., Ogunyemi, D., & Bernstein, C. A. (2009). Burnout during residency training: A literature review. *Journal of Graduate Medical Education, 1*(2), 236–242. https://doi.org/10.4300/JGME-D-09-00054.1

J., A. (2018, November 7). *Effective communication.* The Investors Book. https://theinvestorsbook.com/effective-communication.html

Jackson, A., & Bluteau, P. (2009). Creating a model: Overcoming the challenges of implementing interprofessional education. In P. Bluteau & A. Jackson (Eds.), *Interprofessional education: Making it happen* (pp. 183–201). Palgrave Macmillan.

Joint Commission on Accreditation of Healthcare Organizations. (2005). *The Joint Commission guide to improving staff communication.* Joint Commission Resources.

Kaba, A., Dubé, M., Charania, I., & Donahue, M. (2018). Collaborative practice in action: Building interprofessional competencies through simulation-based education and novel approaches to team training. *Health Education & Care*, *3*(2), 1–9 https://doi.org/10.15761/HEC.1000139

Kirkpatrick, D. (1994). *Evaluating training programs: the four levels.* Berrett-Koehler.

Knowles, M. S. (1970). *The modern practice of adult education: Androgogy versus pedagogy*. Association Press.

Leavy, P. (2017). Research design: Quantitative, qualitative, mixed methods, arts-based, and community-based participatory research approaches. Guilford Publications.

Looman, N., Fluit, C., van Wijngaarden, M., de Groot, E., Dielissen, P, van Asselt, D., de Graaf, J., & Scherpbier-de Haan, N. (2020). Chances for learning intraprofessional collaboration between residents in hospitals. *Medical Education*, *54*(12), 1109–1119. https://doi.org/10.1111/medu.14279

Loyal, J., & Fenick, A. (2020). Entering the workforce: An innovative curriculum to prepare pediatric resident for life after training. *Academic Pediatrics*, *20*(8), 1217–1220. https://doi.org/10.1016/j.acap.2020.06.007

MacDonald, C.J., Archibald, D., Trumpower, D., Casimiro, L., Cragg, B., & Jelley, W. (2010). Designing and operationalizing a toolkit of bilingual interprofessional education assessment instruments. Journal of Research in Interprofessional Practice and Education, 1, 304-316

Martin, C. (2011). Perspective: To what end communication? Developing a conceptual framework for communication in medical education. *Academic Medicine*, 86(12), 1566–1570. https://doi:10.1097/ACM.0b013e31823591b

Matziou, V., Vlahioti, E., Perdikaris, P., Matziou, T., Megapanou, E., & Petsios, K. (2014). Physician and nursing perceptions concerning interprofessional communication and collaboration. *Journal of Interprofessional Care, 28*(6), 526–533. https://doi.10.3109/13561820.2014.934338

McGrail, K. A., Morse, D. S., Glessner, T., & Gardner, K. (2009). "What is found there": Qualitative analyses of physician–nurse collaboration stories. *Journal of General Internal Medicine, 24*(2), 198–204. https://doi.10.1007/s11606-008-0869-5

Merriam, S. B., Caffarella, R. S., & Baumgartner, L. M. (2007). *Learning in adulthood: A comprehensive guide* (3rd ed.). John Wiley & Sons.

Mezirow, J. (1997). Transformative learning: Theory to practice. *New Directions for Adult and Continuing Education, 74*, 5–12. http://dx.doi.org/10.1002/ace.7401

Miles, M. B., & Huberman, A. M. (1994). Qualitative data analysis: An expanded sourcebook. sage.

Miles, M., Huberman, A., & Saldaña, J. (2020). *Qualitative data analysis: A methods sourcebook* (4th ed.). Sage.

Mind Tools. (n.d.). *Kirkpatrick's model*. Retrieved March 20, 2021, from https://www.mindtools.com/pages/article/kirkpatrick.htm

Monroe, K., Kelley, J., Unaka, N., Burrows, H., Marshall, T., Lichner, K., McCaffery, H., Demeritt, B., Chandler, D., & Herrmann, L. (2021). Nurse/resident reciprocal shadowing to improve interprofessional communication. *Hospital Pediatrics*, 11(5), 435-445. https://doi.org/10.1542/hpeds.2020-002345

Morgan, D. L. (2007). Paradigms lost and pragmatism regained methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research, 1*(1), 48–76. https://doi.org/10.1177/2345678906292462

Nair, D., Fitzpatrick, J., McNulty, R., Click, E., & Glembocki, M. (2012). Frequency of nurse-physician collaborative behaviors in an acute care hospital. *Journal of Interprofessional Care, 26*(2), 115–120. https://doi.10.3109/13561820.2011.637647

Nickerson, C. (2021, November 5). Allport's intergroup contact hypothesis: Its history and influence. *Simply Psychology*. https://www.simplypsychology.org/contact-hypothesis.html

Nunnally, J. C. (1978). *Psychometric theory (2nd ed.).* New York: McGraw-Hill.

O'Daniel, M., & Rosenstein, A. H. (2008). Professional communication and team collaboration. In R. G. Hughes (Ed.), *Patient safety and quality: An evidence-based handbook for nurses*. Agency for Healthcare Research and Quality. https://www.ncbi.nlm.nih.gov/books/NBK2637/

Orchard, C., & Bainbridge, L. (2016). Competent for collaborative practice: What does a collaborative practitioner look like and how does the practice context influence interprofessional education? *Journal of Taibah University Medical Sciences*, *11*(6), 526–532. https://doi.org/10.1016/j.jtumed.2016.11.002

Pallant, J. F. (2016). *SPSS survival manual: A step-by-step guide to data analyses using IBM SPSS.* Allen & Unwin

Peterson, E. B., Ostroff, J. S., DuHamel, K. N., D'Agostino, T. A., Hernandez, M., Canzona, M. R., & Bylund, C. L. (2016). Impact of provider-patient communication on cancer screening adherence: A systematic review. *Preventive medicine*, *93*, 96–105. https://doi.org/10.1016/j.ypmed.2016.09.034

Piaget, J. (1971). *Psychology and epistemology: Towards a theory of knowledge*. Grossman.

Price, S., Doucet, S., & Hall, L. (2014). The historical, social positioning of nursing and medicine: Implications for career choice, early socialization, and interprofessional collaboration. *Journal of Interprofessional Care*, *28*(2), 103–109. https://doi.org/10.3109/13561820.2013.867839

Rice, K., Zwarenstein, M., Conn, L. G., Kenaszchuk, C., Russell, A., & Reeves, S. (2010). An intervention to improve interprofessional collaboration and communications: A comparative qualitative study. *Journal of Interprofessional Care*, *24*(4), 350–361. https://doi.org/10.3109/13561820903550713

Rodger, S., & Hoffman, S. (2010). Where in the world is interprofessional education? A global environmental scan. *Journal of Interprofessional Care*, *24*(5), 479–491. https://doi.org/10.3109/13561821003721329

Saldaña, J. M. (2015). *The coding manual for qualitative researchers* (3rd ed.). Sage.

Schmitz, C., Radosevich, D., Jardine, P., MacDonald, C., Trumpower, D., & Archibald, D. (2017). The interprofessional collaborative competency attainment survey (ICCAS): A replication validation study. *Journal of Interprofessional Care*, *31*(1), 28–34 http://dx.doi.org/10.1080/13561820.2016.1233096

Science Direct. (n.d.). *Role theory*. Retrieved October 17, 2021, from https://www.sciencedirect.com/topics/social-sciences/role-theory

Scott, P. (2019). Nursing leaders' ethical decision-making about professional boundaries and nurse patient relationships: A mixed methods explanatory sequential design (Publication No. 352) [Doctoral Dissertation, University of the Incarnate Word]. The Athenaeum. https://athenaeum.uiw.edu/uiw_etds/352/

Shafran, D. M., Richardson, L., & Bonta, M. (2015). A novel interprofessional shadowing initiative for senior medical students. *Medical Teacher*, *37*(1), 86–89. https://doi.org/10.3109/0142159X.2014.929099

Siegrist, J. (2015). Justice and health. In J. D. Wright (Ed.), *International encyclopedia of the social & behavioral sciences* (2nd ed.; pp. 928–931). Elsevier. https://doi.org/10.1016/B978-0-08-097086-8.14084-X

Stein, L. I., Watts, D. T., & Howell, T. (1990). The doctor-nurse game revisited. *The New England Journal of Medicine*, *322*(8), 546–549. https://doi.org/10.1056/NEJM199002223220810

Tang, C., Zhou, W., Chan, S., & Liaw, S. (2018). Interprofessional collaboration between junior doctors and nurses in the general ward setting: A qualitative concurrent exploratory study. *Journal of Nursing Management*, *26*(5), 11–18. https://doi.org/10.1111/jonm.12503

Van Bogaert, P., Kowalski, C., Weeks, S., Van heusden, D., & Clarke, S. (2013). The relationship between nurse practice environment, nurse work characteristics, burnout and job outcome and quality of nursing care: A cross-sectional survey. *International Journal of Nursing Studies*, *50*(12), 1667–1677. https://doi.org/10.1016/j.ijnurstu.2013.05.010

van Diggele, C., Roberts, C., Burgess, A. (2020). Interprofessional education: tips for design and implementation. *BMC Medical Education*, 20(2), 1-6. https://doi.org/10.1186/s12909-020-02286-z

Vazirani, S., Hays, R. D., Shapiro, M. F., & Cowan, M. (2005). Effect of a multidisciplinary intervention on communication and collaboration among physicians and nurses. *American Journal of Critical Care*, *14*(1), 71–77. https://doi.org/10.4037/ajcc2005.14.1.71

Voyer, B. (2013). Changes in the relations and roles of doctors and nurses. *British Journal of Healthcare Management*, *19*(1), 16–21. https://doi.org/10.12968/bjhc.2013.19.1.16

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Wang, Y. Y., Wan, Q. Q., Lin, F., Zhou, W. J., & Shang, S. M. (2018). Interventions to improve communication between nurses and physicians in the intensive care unit: An integrative literature review. *International Journal of Nursing Sciences*, *5*(1), 81–88. https://doi.org/10.1016/j.ijnss.2017.09.007

Weiss, K. B., Bagian, J. P., Wagner, R., & Nasca, T. J. (2014). Introducing the CLER pathways to excellence: A new way of viewing clinical learning environments. *Journal of Graduate Medical Education*, *6*(3), 608–609. https://doi.org/10.4300/JGME-D-14-00347.1

World Health Organization. (1988, January 1). Learning together to work together for Health: Report of a WHO study group on Multiprofessional Education of Health Personnel: The team approach [meeting held in Geneva from 12 to 16 october 1987]. World Health Organization. Retrieved January 28, 2023, from https://apps.who.int/iris/handle/10665/37411

Wright, M., Mankey, C., & Miller, B. (2013). Improving upon the 'July effect': A collaborative, interdisciplinary orientation for internal medicine interns. *Medical Education Online*, *18*(1), 232–249. https://doi.org/10.3402/meo.v18i0.23249

Yin, R. K. (2015). *Qualitative research from start to finish*. Guilford publications.

Zierler. B. (2019, December 3). What is ipe (interprofessional education), and why do you think it is important? Ice blog. https://icenetblog.royalcollege.ca/2019/12/03/bethany-due-nov-21/

Appendices

# Appendix A

## Prestudy 1: Survey Preintervention

**Submitted for Publication – Not Accepted**

## Pediatric Intern and Nurse Perceptions of Shared Communication and Professional Role Responsibility Before an Intervention

In this exploratory study, nurses and pediatric interns participated in an interprofessional buddy program that aimed to improve communication skills and understanding of role definition between this healthcare team dyad. The present paper being the first of a larger study set to examine the entirety of the interprofessional buddy program investigates the initial perceptions of shared communication and professional role responsibility by the participants prior to the intervention as a mechanism to determine if negative perceptions are visible before practice or as a result of a long career. The program created was intended to strengthen the relationship between residents and nurses beginning on day one of the residents' three-year training. The initial perceptions of the participants will be explored in this paper and will provide a foundation for a more in-depth analysis of the program components in future research.

### Present Study

This exploratory study investigates the initial perceptions of shared communication and professional role responsibility by nurses and pediatric interns using survey data gathered prior to their participation in an interprofessional buddy program via the Pre-buddy Program survey data completed annually from 2014-2019. The Pre-buddy Program survey instrument is explored in further detail; however, it should be noted that questions were created using the program-specific objectives and not a previously vetted instrument. Following the initial Pre-buddy Program survey, the participants engaged in yearlong activities to develop these focused skills,

as explored below. This study will aim to determine if there is a difference in nurse and intern perceptions of role and communication prior to intervention and for interns prior to beginning their training. Additionally, the study aims to validate the perception instrument created to gauge the perceptions specific to this program dynamic and participants. The hypothesis is that interns' perceptions will be more agreeable than early-career nurses to collaborative aspects of role definition and communication as they have not entered practice, given that studies by Matziou, et al. (2014) and Nair et al. (2012) have found that more experienced physicians and nurses tend to perceive collaboration more negatively, which seems to be based on their years of time in practice.

**Methodology**

The aim of this exploratory study was to investigate the initial perceptions of shared communication and professional role responsibility between pediatric interns and pediatric hospital nurses prior to an intervention. The study was conducted using a two-group design convenience sample at a large academic health center in South Texas and data was collected using a pre-intervention questionnaire.

**Setting**

The program was administered, and data was collected at an academic health institution learning center, which is centrally located to the clinical work environment allowing for ease of access for all participants. All Pre-buddy Program surveys were collected electronically using a secure network line via SurveyMonkey. Data being reviewed for this project was collected from June 2014 – June 2019 to include five cohorts with no difference to the structure of the program meeting times, locations or curriculum provided.

## Participants and Program

The interprofessional program was a 12-month commitment and enrolled in a new cohort annually. The program partnered self-selected pediatric nurses that had been in practice for 2-3 years and all incoming Pediatric interns from a residency program in South Texas. Inclusion criteria for interns were based on enrollment in the program as a mandatory educational component and nurse selection was completed in collaboration with the nursing supervisor based on years of service and interest in participation. Inclusions were based on nurse criteria with 2-3 years of service required to participate and approval from the nursing supervisor. All participants were provided the same weeklong orientation, quarterly didactics and interactive activities focused on team building, role definition, effective communication, and conflict management. Cohorts varied in size as incoming interns changed based on available funding and nurses based on interest and inclusion criteria. Cohort 1 had 8 interns and 6 nurses, cohort 2 had 13 interns and 7 nurses, cohort 3 had 14 interns and 5 nurses, cohort 4 had 13 interns and 10 nurses and cohort 5 had 11 interns and 7 nurses. In addition to the completion of the Pre-buddy Program survey, the cohorts also completed monthly reflective journals, program improvement surveys, and quality improvement projects which are not included in this study.

## Ethics

The study received IRB approval from its university partner and consent was gained through the completion of the Pre-buddy Program survey. Participants were not compensated for their participation in the program but did receive a completion certificate.

## Data Collection

The Pre-buddy Program surveys were administered to 94 participants prior to the beginning of the intervention program. The Pre-buddy Program survey were provided via

SurveyMonkey with a 2-hr turnaround time. All Pre-buddy Program surveys were anonymous, no demographic information was collected, and the only identifier was by a professional group. Data collected was reviewed for five cohorts and analysis was run reviewing role designation over all 5 years combined.

**Instrument**

The questionnaire was created to address the individual objectives specific to the program components and was loosely driven by the Communication and Collaboration among physicians and nurse's questionnaires (Vazirani, Hays, Shapiro & Cowan, 2005). The Vazirani (2005) survey is based on broad perceptions of groups elicited from practicing healthcare team members without the goal of the intervention. The Pre-buddy Program survey offered 17 questions based on a 5-point LIKERT scale ranging from Strongly Agree to Strongly Disagree. The questions were sub-grouped under two designations: communication and role definition. The instrument was vetted through a group of experts identified for their work with interprofessional training between nurses and physicians at varying career levels. Descriptive statistics were performed on all 17 questions between the nurse and intern roles, followed by factor analysis. There is no previous research on this assessment tool as it was built around implementation program curriculum objectives. To reduce response bias, questions that were negatively worded (Q 3, 6, 11, 15 and 16) were reverse coded. All tests were performed using SPPS version 27.

**Data Conditions and Analysis**

This nonexperimental design allowed for multi-group comparison without manipulation to support the need for the implementation of a targeted program. The data was reviewed and there were no skipped or missed questions offering a 100% response rate. There was no hypothesis involved in the analytic strategy. All data correlations were run through SPSS,

looking for the average value of the coded subgroup responses. The data analysis protocol began with cleaning and reverse coding of questions to ensure response bias was eliminated. Next, using SPSS version 27, a factor analysis was run and using eigenvalues/scree plot, the appropriate number of factors was determined. The factor loadings were inspected to determine their appropriateness and then the nurse and interns scores were summed, and independent T-Test was conducted, as shown in the result below.

**Results**

The sample consisted of 35 nurses and 59 interns, resulting in a total sample of 94 participants. There were no other demographics obtained outside of the role. The Pre-buddy Program survey offered 17 questions initially developed to elicit two constructs: role definition and communication between the dyad. After the factor analysis was performed, a third factor was identified focused on job-specific tasks related to electronic medical records. Prior to performing a principal component analysis (PCA), the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of coefficients of .3 and above. The Kaiser-Meyer-Olkin value was .72, exceeding the recommended value of .6 (Kaiser 1970, 1974) and Bartlett's Test of Sphericity (Bartlett, 1954) reached statistical significance, supporting the factorability of the correlation matrix. Principal components analysis revealed the presence of seven components with eigenvalues exceeding 1, explain 22.8%, 18.6%, 8.1%, 7.3%, 6.4%, and 6.1% of the variance, respectively. An inspection of the scree plot revealed a clean break after the third component. Using Catell's (1966) scree test, it was decided to retain three components for further investigation, as shown in Table 1. The three-component solution explained a total of 49.5% of the variance, with component 1 contributing 22.8%, component 2 contributing 18.6% and component 3 contributing 8%. The Oblimin rotated solution revealed the presence of simple

structure (Thurstone, 1947), with the three components showing several strong loadings and all but three variables loading substantially on two components. There was a weak negative correlation between three factors (r = -.007) (Pallant, 2016, p. 201)

**Table 1**

*Pattern Matrix for Factor Analysis*

| | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| 1. I am confident in my ability to provide an efficient, yet thorough hand-off to nurses/interns. (C) | | *.313* | .614 |
| 2. I feel comfortable asking nurses/interns for help, even during times of stress. (C) | | | .479 |
| 3. I am often frustrated with the amount of clarification that is needed on orders or patient plans. (C) **RC** | | .350 | |
| 4. I have a good understanding with the nurses/interns about our respective responsibilities. (R) | | | .708 |
| 5. Nurses and interns are part of a care team and should share responsibility for any success or failure. (R) | | | |
| 6. Nurses/Interns do not usually ask for our opinions in the care of our patients. (C) **RC** | | .385 | |
| 7. Nurses/Interns cooperate with us in organizing the care of our patients (R) | | -.518 | |
| 8. I am treated with respect and a positive attitude by the nurses/interns when I ask for help or have questions. (C) | | -*.441* | .347 |
| 9. I enjoy working with nurses/interns and could not do my job without them (F) | | | |
| 10. Nurses/Interns are willing to take into account my convenience when planning their work. (R) | | -.476 | |
| 11. Nurses/Interns think their work is more important than our work (R) **RC** | | .769 | |

| | | | |
|---|---|---|---|
| 12. I have a clear understanding of a nurse's/intern's daily responsibilities and workflow process (R) | | | .474 |
| 13. I have a clear understanding of how orders are put into the computer by interns and nurses and how they are viewed by both parties (R) | | | |
| 14. I understand how nurses/interns are notified of whether a medication or lab was performed. (R/C) | .523 | | *.462* |
| 15. I often feel as though nurses/interns do not understand how difficult my job is. (R) **RC** | | .855 | |
| 16. I often feel as though nurses/interns do not appreciate the amount of work I do (R) **RC** | | .837 | |
| 17. Patient harm is often a result of many factors, as opposed to one person's action. (R/C) | -.336 | | |

*Note.* Extraction Method: Maximum Likelihood.
Rotation Method: Oblimin with Kaiser Normalization.
Rotation converged in 6 iterations.
Reverse Coded (RC) #3, 6, 11, 15 & 16

*Note.* These are the individual loadings onto the Factors.

**FACTOR 1 – Specific Actionable Job Duties – both computers based related to EMR**

Q13. I have a clear understanding of how orders are put into the computer by interns and nurses and how they are viewed by both parties.
Q14. I understand how nurses/interns are notified of whether a medication or lab was performed.
Q17. Patient harm is often a result of many factors, as opposed to one person's action.

**FACTOR 2 – Negative communication based on hierarchy/perceived respect**

Q3. I am often frustrated with the amount of clarification that is needed on orders or patient plans.
Q6. Nurses/Interns do not usually ask for our opinions in the care of our patients.
Q7. Nurses/Interns cooperate with us in organizing the care of our patients.
Q8. I am treated with respect and a positive attitude by the nurses/interns when I ask for help or have questions.
Q10. Nurses/Interns are willing to take into account my convenience when planning their work.
Q11. Nurses/Interns think their work is more important than our work.
Q15. I often feel as though nurses/interns do not understand how difficult my job is.
Q16. I often feel as though nurses/interns do not appreciate the amount of work I do.

**FACTOR 3 – Shared Responsibility and Positive Communication**

Q1. I am confident in my ability to provide an efficient, yet thorough hand-off to nurses/interns.
Q2. I feel comfortable asking nurses/interns for help, even during times of stress.
Q4. I have a good understanding with the nurses/interns about our respective responsibilities.
Q12. I have a clear understanding of a nurse's/intern's daily responsibilities and workflow process.

Following Factor Analysis, independent T-Test was performed to compare the means between roles to locate statistically significant evidence that the groups' perceptions are different between the 3 factors shown in Figure 1; electronic medical record-based job tasks, hierarchical driven barriers to communication related to the job role and patient care and help-seeking behaviors and role responsibility. Factor 1 compared scores for nurse and intern perception of electronic medical record-based job tasks seen in Table 3. There was a statistically significant difference in scores for nurses ($M$ = 11.29, $SD$ = 1.71) and interns ($M$= 8.89, $SD$ = 1.64, $t$ (92) = 6.765, $p$ = <.005, two-tailed). The magnitude of the differences in the means (mean difference = -2.4, 95% CI: 1.69 to 3.11) was large (Cohen's d = 1.67). Factor 2 compared scores for nurse and intern perception of hierarchical driven barriers to communication related to the job role and patient care seen in Table 3. There was a statistically significant difference in scores for nurses ($M$= 25.82, $SD$ = 2.71) and interns ($M$= 23.72, $SD$ = 2.51, $t$ (92) = 3.80, $p$ = <.005, two-tailed). The magnitude of the differences in the means (mean difference = 2.1, 95% CI: 1.00 to 3.2) was large (Cohen's d = 2.6). Finally, Factor 3 compared scores for nurses' and interns' perception of help-seeking behaviors and role responsibility seen in Table 3. There was a statistically significant difference in scores for nurses ($M$= 15.9, $SD$ = 1.99) and interns ($M$= 13.8, $SD$ = 2.31, $t$ (92) = 4.44, $p$ = <.005, two-tailed). The magnitude of the differences in the means (mean difference = 2.08, 95% CI: 1.15 to 3.02) was large (Cohen's d = 2.19) (Pallant, 2016, p. 248).

**Table 3**

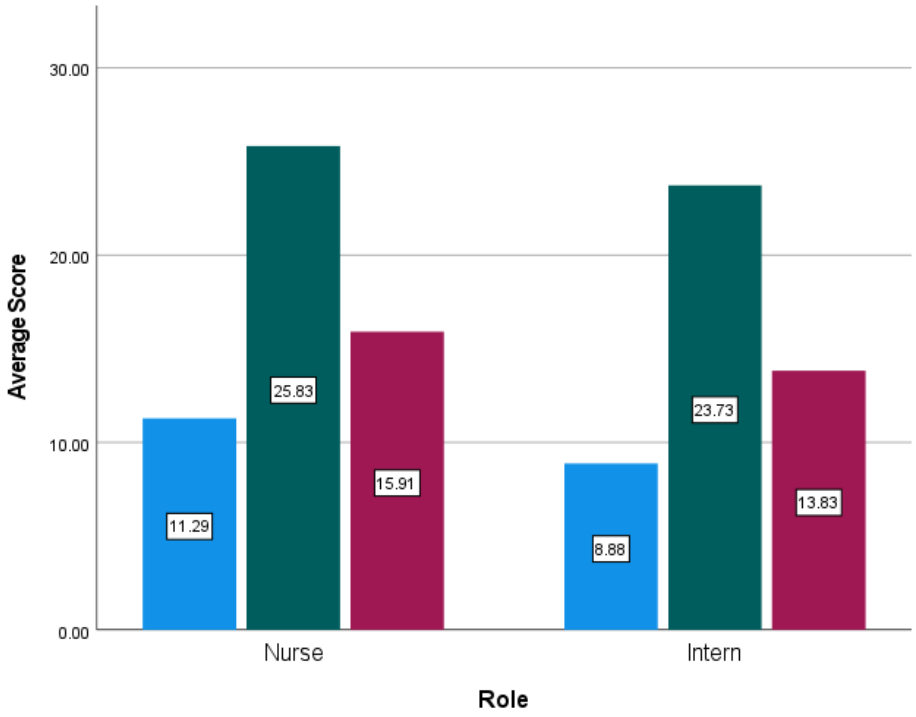
*Independent Samples T-Test on Factors Differences between nurses and intern reports of their perceptions pre-intervention (N = 94)*

| | Nurse (n = 35), $M \pm SD$ | Intern (n=59), $M \pm SD$ | $t$ -value |
|---|---|---|---|
| Factor 1: electronic medical record based job tasks | 11.29 ± 1.7 | 8.9 ± 1.6 | 6.77** |
| Factor 2: hierarchical driven barriers to communication related to job role and patient care | 25.8 ± 2.7 | 23.7 ± 2.5 | 3.8** |
| Factor 3: help seeking behaviors and role responsibility | 15.9 ± 1.9 | 13.8 ± 2.3 | 4.44** |

***p < .001 (two tailed)

**Figure 1**

*Comparison of Mean Scores between Nurses and Interns on Factors Differences between nurses and intern reports of their perceptions pre-intervention (N = 94). For this figure the average scores weren't normalized so the large difference among factors is due to a different number of items*




Note. Comparison of mean scores for nurses and intern on factors that influence role definition and communication. Scale ranges from 1 (strongly disagree) to 5 (strongly agree). All differences are significant at ***p < .001 (two tailed)

To support the data analysis process, descriptive statistics were performed to look at the individual survey question means and standard deviations between nurses and interns, as shown in Table 2.

**Table 2**

*Descriptive Statistics on Nurse and Intern Perceptions by Survey Items*

| | Role | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| | Nurse | 35 | 4.34 | .54 | .09 |

| | | | | | |
|---|---|---|---|---|---|
| 1. I am confident in my ability to provide an efficient, yet thorough hand-off to nurses/interns. (C) | Intern | 59 | 3.02 | .82 | .11 |
| 2. I feel comfortable asking nurses/interns for help, even during times of stress. (C) | Nurse | 35 | 4.46 | .68 | .11 |
| | Intern | 59 | 4.14 | .79 | .10 |
| 3. I am often frustrated with the amount of clarification that is needed on orders or patient plans. (C) **RC** | Nurse | 35 | 2.97 | .98 | .17 |
| | Intern | 59 | 2.66 | .73 | .09 |
| 4. I have a good understanding with the nurses/interns about our respective responsibilities. (R) | Nurse | 35 | 3.97 | .57 | .09 |
| | Intern | 59 | 3.58 | .75 | .09 |
| 5. Nurses and interns are part of a care team and should share responsibility for any success or failure. (R) | Nurse | 35 | 4.77 | .43 | .07 |
| | Intern | 59 | 4.59 | .49 | .06 |
| 6. Nurses/Interns do not usually ask for our opinions in the care of our patients. (C) **RC** | Nurse | 35 | 2.54 | 1.01 | .17 |
| | Intern | 59 | 2.20 | .83 | .11 |
| 7. Nurses/Interns cooperate with us in organizing the care of our patients (R) | Nurse | 35 | 3.89 | .63 | .11 |
| | Intern | 59 | 4.30 | .53 | .07 |
| 8. I am treated with respect and a positive attitude by the nurses/interns when I ask for help or have questions. (C) | Nurse | 35 | 4.03 | .62 | .10 |
| | Intern | 59 | 3.95 | .57 | .07 |
| 9. I enjoy working with nurses/interns and could not do my job without them (F) | Nurse | 35 | 4.31 | .58 | .09 |
| | Intern | 59 | 4.66 | .51 | .07 |
| 10. Nurses/Interns are willing to take into account my convenience when planning their work. (R) | Nurse | 35 | 3.06 | .99 | .17 |
| | Intern | 59 | 3.42 | .67 | .09 |
| 11. Nurses/Interns think their work is more important than our work (R) **RC** | Nurse | 35 | 2.91 | 1.03 | .18 |
| | Intern | 59 | 2.34 | .66 | .09 |
| | Nurse | 35 | 3.14 | 1.00 | .17 |

| | | | | | |
|---|---|---|---|---|---|
| 12. I have a clear understanding of a nurse's/intern's daily responsibilities and workflow process (R) | Intern | 59 | 3.10 | .94 | .12 |
| 13. I have a clear understanding of how orders are put into the computer by interns and nurses and how they are viewed by both parties (R) | Nurse | 35 | 3.31 | 1.05 | .18 |
| | Intern | 59 | 2.36 | .94 | .12 |
| 14. I understand how nurses/interns are notified of whether a medication or lab was performed. (R/C) | Nurse | 35 | 3.63 | .91 | .15 |
| | Intern | 59 | 2.32 | .89 | .12 |
| 15. I often feel as though nurses/interns do not understand how difficult my job is. (R) **RC** | Nurse | 35 | 3.37 | 1.06 | .18 |
| | Intern | 59 | 2.49 | .79 | .10 |
| 16. I often feel as though nurses/interns do not appreciate the amount of work I do (R) **RC** | Nurse | 35 | 3.06 | 1.11 | .19 |
| | Intern | 59 | 2.36 | .74 | .09 |
| 17. Patient harm is often a result of many factors, as opposed to one person's action. (R/C) | Nurse | 35 | 4.34 | .80 | .14 |
| | Intern | 59 | 4.20 | .74 | .09 |

*Notes.* The rating scale was as follows; 5 = Strongly Agree and 1 = Strong Disagree, RC – 1 = Strongly Agree and 5 = Strongly Disagree.

**Discussion**

Although initially focused on two categories for review (communication and role definition), the EFA results offered a deeper dive into the meaning of these terms and provided a third factor not initially observed. The results offered more detailed specifications on perceptions identified in three subgroups; electronic medical record-based job tasks (1), hierarchical driven barriers to communication related to the job role and patient care (2) and help-seeking behaviors and role responsibility (3) as shown in Table 2.

There were statistically significant differences between nurse and intern perception on all three factors with nurses offering a higher level of agreement for each. Hierarchical driven barriers to communication related to the job role and patient care encompassed factor 2 and

showed a shared agreement by both roles on frustration in communicating and acting with shared decision making about patient care processes. There is also a shared feeling of lack of team acknowledgment and appreciation for each other's role and work processes. This factor offered the highest number of Pre-buddy Program survey item loadings. Interns in this factor showed agreement in perceiving those nurses do not understand how difficult their job is and do not appreciate the amount of work completed yet they have not to this point worked as a physician member of the team which is a noted stereotype between groups (Liaw et al., 2014). This subgroup on communication supports the literature that there is a lack of effective communication, inclusive shared decision making and appreciation of responsibility between the dyad (Stein, 1990). This outcome provides further data to support the need for formal training in effective communication, active listening, and team appreciation among these specific roles to eliminate stereotypes and improve collaborative behaviors (Matziou et al., 2014; Liaw et al., 2014).

Help-seeking behaviors and role responsibility found in factor 3 showed shared agreement in comfort in seeking help, yet neither role has a clear understanding of each other's daily responsibilities or workflow processes. Formal education for both roles lacks knowledge, skills, and ability training on the other roles of the team, focusing primarily on the training of the respective nurse or physician in the classroom (Reese, et al., 2010). Given this lack of understanding of daily responsibilities and workflow processes for the "other", it is expected that tension may arise between the groups. This tension results from multiple tasks that are necessary for patient care but lack of understanding as to who is responsible for each task not being clear and identifiable. When team members are unclear as to their role, responsibility and overall

expectations, then blame is the norm over ownership in what can seem like a “knowledge war” (Price et al., 2014).

The largest difference between nurses and interns in role perception was located on factor 1 based on electronic medical record (EMR) job-related tasks. Two questions in this subgroup looked at the understanding of how orders are placed and viewed in the EMR system, as well as how roles are notified about and able to view completed orders. In this factor, nurses agreed to understand the process, whereas the intern acknowledged they did not understand the entire process. The assumption for this factor is that onboarding interns have not been a part of this process in their medical education as hierarchy dictates this action is the job responsibility of the upper-level resident or faculty leaving the typical medical student without formal training on this expected job duty until they are in the role. The nurse in this factor is responsible in both schools and on the job to perform job-specific tasks to ensure patient management is completed in a timely fashion (Chorostecki et al., 2016). At the item level, both roles agreed that patient harm is a team-based issue and not solely based on one person’s actions. This is an item level reflection but is important because it showed that there is an understanding of team-based care and shared responsibility regarding poor patient outcomes from both groups.

**Limitations**

The sample size regarding the nursing compliment was a limitation as the numbers were not indicative of the number of nurses represented on the pediatric floor. The sample size was sufficient for the purpose of this study as the focus was on the physician in training perspective. Another limitation was that all participants were from one institution and therefore, the results might not be applicable to other pediatric hospital units or specialties. Initially, the hope had been to connect pre-and post-survey results, but due to IT programming issues, this was not

feasible as the participant IDs were mismatched. Therefore, the research team focused on the critical issue of pre-intervention perceptions in relation to literature. A second pilot study is planned to use qualitative methods to determine a change in perception post-intervention by coding the participant reflective journals.

**Conclusion**

Much research conducted on the nurse-physician relationship looks to identify perceptions once in practice, but few have considered looking at entering physicians' perceptions to mitigate future issues by supporting their training earlier in their career. This study and the now vetted Pre-buddy Program survey instrument offers insight into pre-existing perceptions about interns and nurse communication, roles, and job-related tasks. The conflicts found between the roles are historical and have been referred to in research, education, and business literature as a hindrance to better patient care outcomes (Price et al., 2014). Yet, this imperative working relationship has not been a focus in the formal education setting or the informal learning environment as a necessary part of their professional duties, leaving these underdeveloped skills to be subjected to defense-based professional development to mitigate conflict. This team-based issue has shown to not be "just a part of the culture" as implied in previous research (Stein, 1990) but is due to a lack of necessary job training, exposure to positive role models and experience working in an interprofessional clinical setting. Time on the job is a common intervention but has been shown to cause turnover with nursing staff and reduced job satisfaction in both roles (Van Bogaert et al., 2013). Instead of waiting on the roles to learn as they go, this study via the Pre-buddy Program survey instrument has shown that perceptions of frustration in communicating and acting with shared decision making are already embedded by interns prior to

residency. Nurses in practice have a shared sense of agreement in many of the same areas that could be built upon to create a more shared decision team-based model.

The use of objective-specific training may reduce the issues from an earlier point preventatively and as a part of the required education since it will be as much a part of their careers as disease profiles and medical theory (IPEC, 2020). Oftentimes medical students enter higher education without previous employment experience and are reliant on the medical school setting to teach all collaborative job skills required to be successful post-graduation (Weiss et al., 2014). In variation, many nursing students that enter formal nursing education have had some work experience prior and have gained collaborative skill sets through those experiences (Van Bogaert et al., 2013). Both professional schools are built around the need for nurse/physician relationships to provide competent patient care, yet neither have successfully devised a method to inform, instruct and assess the capabilities of their graduates in collaborative care behaviors such as communication and role definition (IPEC, 2020). This study supports these collaborative job skills are perceived differently by nurses and interns and that less agreeable perceptions are had by interns before entering clinical practice again, supporting the need for education earlier in physician careers.

Young physicians in training are cast into a supervisor role with no training yet seemingly arrive with less than agreeable perceptions of their nurse counterparts per this study, as seen in Table 1. The work environment upon arrival is the main source of behavior and work modeling, leading to continued strained relationships between nurses and doctors, as it is reliant on individual experience and no formal skill training (Nair et al., 2012). Interns are expected to perform collaborative skills they have not been trained for and then placed in a position of authority which could explain the difference in perceptions that lead to later conflict (McGrail et

al., 2008). Yet, nurses with years of experience and exposure remain a supportive member of the team not being seen for their actual knowledge and participation in the larger system of patient care management (Price et al., 2014). The overall goal and objectives of the buddy program align with the findings of Nair et al. (2012) and Liaw et al. (2014) in that it is possible that preventative instruction in the form of interprofessional education earlier in career development could mitigate future practice tensions between nurses and physicians. The initial perceptions found in this study support the need for early education to be focused on daily responsibility, role flexibility, team membership, and effective communication skills between this historically strained relationship. Factor 3 supported that these two groups feel agreeable in asking for help but that they lack an understanding of each other's roles on the team.

This study provided confirmation that early-career physicians enter training with pre-developed perceptions of lacking ability surrounding electronic medical record-based job tasks, hierarchical driven barriers to communication related to the job role and patient care and limited insight into role responsibility of team members. This lack of understanding of team membership and communication can be mitigated with collaborative education programs that allow nurses and interns to learn together and find an organic balance in their job duties that works best with individual organizational cultures. Formal education about teamwork should no longer be offered in silos if healthcare is focused on interprofessional collaboration to offer improved patient care. These results are meaningful for the field of graduate medical education as they direct the need for future research away from late-stage professional life intervention towards a focus on the utilization of a preventative approach to interprofessional education earlier in training. The next steps for this larger project are to qualitatively review the reflective journals of these same participants, to determine if participation in an interprofessional program leads to a reduction in

communication and role-based conflict, and an increase in transparent understanding of the importance of shared decision-making in-patient care.

# References


Accreditation Council for Graduate Medical Education. (2020, July 1). *ACGME program requirements for graduate medical education in pediatrics.* https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/320_Pediatrics_2020.pdf?ver=2020-06-29-162726-647

Alzamil, H., & Meo, S. A. (2020). Medical students' readiness and perceptions about interprofessional education: A cross-sectional study. *Pakistan Journal of Medical Sciences*, *36*(4), 693–698. https://doi.org/10.12669/pjms.36.4.2214

Amudha, P., Hamidah, H., Annamma, K., & Ananth, N. (2018). Effective communication between nurses and doctors: Barriers as perceived by nurses. *Journal of Nursing and Care*, *7(*3). https://doi.10.4172/2167-1168.1000455

Chorostecki, C., Van Soren, M., MacMillan, K., Sidani, S., Donald, F., & Reeves, S. (2016). A qualitative study of nurse practitioner promotion of interprofessional are across institutional settings: Perspectives from different healthcare professionals. *International Journal of Nursing Sciences*, *3*(1), 3–10. https://dx.doi.org/10.1016/j.ijnss.2016.02.003

Fagin, C. (1992). Collaboration between nurses and physicians: No longer a choice. *Academic Medicine: Journal of the Association of American Medical Colleges*, *67*(5), 295–303. https://doi.10.1097/00001888-199205000-00002

Interprofessional Education Collaborative. (2020). *Core competencies for interprofessional collaborative practice: 2016 update.* https://nebula.wsimg.com/2f68a39520b03336b41038c370497473?AccessKeyId=DC06780E69ED19E2B3A5&disposition=0&alloworigin=1

J., A. (2018, November 7). *Effective communication.* The Investors Book. https://theinvestorsbook.com/effective-communication.html

Joint Commission on Accreditation of Healthcare Organizations. (2005). *The Joint Commission guide to improving staff communication.* Joint Commission Resources.

Liaw, S., Siau, C., Zhou, W., & Lau, T. (2014). Interprofessional simulation-based education program: A promising approach for changing stereotypes and improving attitudes toward nurse-physician collaboration. *Applied Nursing Research*, *27*(4), 258–260. https://dx.doi.org/10.1016/j.apnr.2014.03.005

Matziou, V., Vlahioti, E., Perdikaris, P., Matziou, T., Megapanou, E., & Petsios, K. (2014). Physician and nursing perceptions concerning interprofessional communication and collaboration. *Journal of Interprofessional Care*, *28*(6), 526–533. https://doi.10.3109/13561820.2014.934338

McGrail, K. A., Morse, D. S., Glessner, T., & Gardner, K. (2009). "What is found there": Qualitative analyses of physician–nurse collaboration stories. *Journal of General Internal Medicine*, *24*(2), 198–204. https://doi.10.1007/s11606-008-0869-5

Nair, D., Fitzpatrick, J., McNulty, R., Click, E., & Glembocki, M. (2012). Frequency of nurse-physician collaborative behaviors in an acute care hospital. *Journal of Interprofessional Care*, *26*(2), 115–120. https://doi.10.3109/13561820.2011.637647

O'Daniel, M., & Rosenstein, A. H. (2008). Professional communication and team collaboration. In R. G. Hughes (Ed.), *Patient safety and quality: An evidence-based handbook for nurses*. Agency for Healthcare Research and Quality. https://www.ncbi.nlm.nih.gov/books/NBK2637/

Pallant, J. F. (2016). *SPSS survival manual: A step-by-step guide to data analyses using IBM SPSS.* Allen & Unwin

Price, S., Doucet, S., & Hall, L. (2014). The historical, social positioning of nursing and medicine: Implications for career choice, early socialization, and interprofessional collaboration. *Journal of Interprofessional Care*, *28*(2), 103–109. https://doi.org/10.3109/13561820.2013.867839

Reese, C., Jeffries, P., & Engum, S. (2010). Learning together: Using simulations to develop nursing and medical student collaboration. *Nursing Education Perspectives*, *31*(1), 33–37.

Rice, K., Zwarenstein, M., Conn, L. G., Kenaszchuk, C., Russell, A., & Reeves, S. (2010). An intervention to improve interprofessional collaboration and communications: A comparative qualitative study. *Journal of Interprofessional Care*, *24*(4), 350–361. https://doi.org/10.3109/13561820903550713

Shafran, D. M., Richardson, L., & Bonta, M. (2015). A novel interprofessional shadowing initiative for senior medical students. *Medical Teacher*, *37*(1), 86–89. https://doi.org/10.3109/0142159X.2014.929099

Stein, L. I., Watts, D. T., & Howell, T. (1990). The doctor-nurse game revisited. *The New England Journal of Medicine*, *322*(8), 546–549. https://doi.org/10.1056/NEJM199002223220810

Tang, C., Zhou, W., Chan, S., & Liaw, S. (2018). Interprofessional collaboration between junior doctors and nurses in the general ward setting: A qualitative concurrent exploratory study. *Journal of Nursing Management*, *26*(5), 11–18. https://doi.org/10.1111/jonm.12503

Van Bogaert, P., Kowalski, C., Weeks, S., Van heusden, D., & Clarke, S. (2013). The relationship between nurse practice environment, nurse work characteristics, burnout and job outcome and quality of nursing care: A cross-sectional survey. *International Journal of Nursing Studies*, *50*(12), 1667–1677. https://doi.org/10.1016/j.ijnurstu.2013.05.010

Vazirani, S., Hays, R. D., Shapiro, M. F., & Cowan, M. (2005). Effect of a multidisciplinary intervention on communication and collaboration among physicians and nurses. *American Journal of Critical Care*, *14*(1), 71–77. https://doi.org/10.4037/ajcc2005.14.1.71

Voyer, B. (2013). Changes in the relations and roles of doctors and nurses. *British Journal of Healthcare Management*, *19*(1), 16–21. https://doi.org/10.12968/bjhc.2013.19.1.16

Wang, Y. Y., Wan, Q. Q., Lin, F., Zhou, W. J., & Shang, S. M. (2017). Interventions to improve communication between nurses and physicians in the intensive care unit: An integrative literature review. *International Journal of Nursing Sciences*, *5*(1), 81–88. https://doi.org/10.1016/j.ijnss.2017.09.007

Weinberg, D., Miner, D., & Rivlin, L. (2009). 'It depends': Medical residents' perspectives on working with nurses. *American Journal of Nursing*, *109*(7), 34–43. https://doi.org/10.1097/01.naj.0000357167.63636.98

Weiss, K. B., Bagian, J. P., Wagner, R., & Nasca, T. J. (2014). Introducing the CLER pathways to excellence: A new way of viewing clinical learning environments. *Journal of Graduate Medical Education*, *6*(3), 608–609. https://doi.org/10.4300/JGME-D-14-00347.1

Wright, M., Mankey, C., & Miller, B. (2013). Improving upon the 'July effect': A collaborative, interdisciplinary orientation for internal medicine interns. *Medical Education Online*, *18*(1), 232–249. https://doi.org/10.3402/meo.v18i0.23249

Appendix B

Prestudy 2: Participant Journal Review

**Pediatric Academic Society 2018 Poster Session presented by Dr. Haneme Idrizi**

***no paper written**

## Background

Interprofessional Collaboration (IPC) literature shows physicians and nurses do not always work together in true partnership. Interprofessional collaboration (IPC) is considered a key element for providing high-quality clinical care. Limited information exists regarding IPC between resident physicians and nurses. Nurse-Resident relationships may be key; it is theorized reaching doctors early in training with interprofessional education (IPE) opportunities may lead to cooperative relationships. Better understanding of factors affecting their relationships may delineate elements that can facilitate a collaborative clinical work environment. Reflective journaling by participants in an IPE program is used to understand and promote IPC to benefit nurse-resident relationships. Through the qualitative analysis of reflective journal entries in an IPE program, our goal was to:

- Identify what nurse-residents want one another to know in developing collaborative relationships
- Explore factors that positively and negatively affect nurse-resident relationships.
- Identify methods to promote a collaborative clinical work environment.

## Participants/Site/IRB

The Pediatric Buddy Program, an IRB approved IPE program at UT Health San Antonio, pairs Pediatric interns and nurses to collaborate on yearlong projects. Participants consisted of 40

Pediatric interns (UT Health San Antonio) and 16 nurses (University Health System) in San Antonio, TX from 2015-2017.

**Methods**

The Pediatric Buddy Program requires monthly reflective journaling by all participants based on prompts related to nurse-physician relationships. Qualitative analysis was conducted on 672 journal entries collected electronically from June 2015 - May 2017. Entries were de-identified and analyzed by 3 independent reviewers via constant comparative method. QDA Miner Lite qualitative data analysis software was also utilized to review entries until saturation was reached and repeating trends identified. The codes were finalized via discussion and consensus. Using reflective journaling by participants in an Interprofessional Education (IPE) program at UT Health San Antonio, our study sought:

1. investigate factors that affect nurse-resident relationships
2. explore perceptions of enablers & barriers to collaboration
3. identify facilitators of a collaborative clinical work environment

**Results**

Residents and nurses want each side to know vital information about the other; Nurses desire to be treated as highly educated, equals in intelligence, experts in patient care, and their role as patient advocates to be known, respected. Residents desire to be recognized as intelligent and possessing background knowledge, but fearful and needing help in practical issues. Newly qualified doctors want medical team hierarchy and their limited decision-making power known. Program participants identified several positive influences on collaboration such as familiarity, trust, good communication and readily offered assistance. Lack of mutual respect, time limitations, misconceptions and physical distance may discourage collaboration. Most

importantly, most participants identified longitudinal interprofessional education programs, multidisciplinary rounds, shadowing opportunities and near proximity of work areas as potential interventions.

**Review of over 600 journal entries revealed 3 core concepts:**

**Areas of Knowing:**

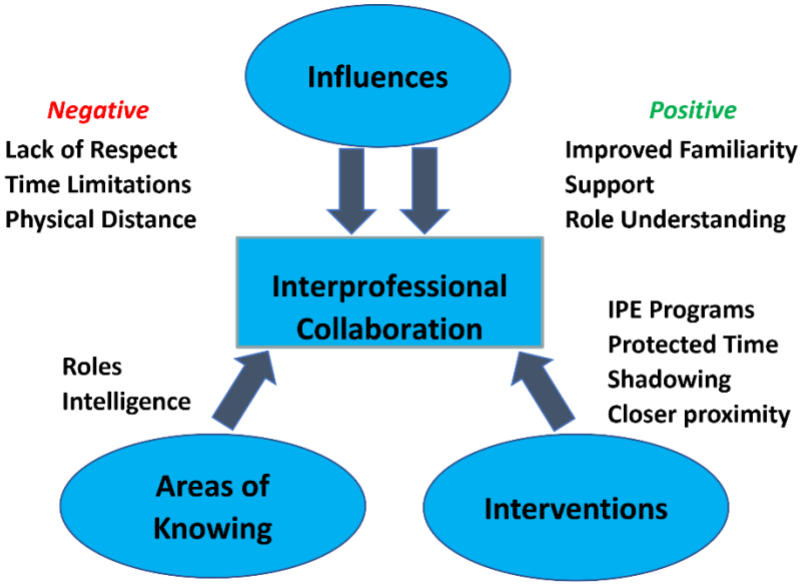
- Nurses want to be known as equals in intelligence, experts in care.
- Nurses want their role as patient advocates to be known & respected.
- Interns want to be known as intelligent with a great deal of background knowledge but needing help in practical issues.
- Interns want hierarchical place in the medical team and limited decision-making power to be understood.

**Positive and Negative Influences:**

- Improved familiarity leads to trust, comfort & better communication.
- Nurse support is welcomed by interns; nurses want to offer support.
- Improved role understanding leads to less preconceived notions.
- Lack of respect and cordiality results in negative relationships.
- Limited time and physical distance hinder open collaboration.

**Potential Interventions**

- IPE programs that promote bonding and relationship-building.
- Protected time to discuss care plans, i.e., family centered rounds.
- Shadowing opportunities for clear role understanding.
- Working in closer proximity to promote clear, open communication.



## Conclusion

Despite differences, nurses and interns have similar ideas about what promotes and hinders true IPC. Both want deeper understanding of each other to improve work relationships. Interns acknowledge lack of clinical experience and welcome nurse aid. Nurses want to help and offer support to ease the intern transition. Both want and demand respect, nurses for their experience and interns for the years of education. Familiarity improves trust, comfort, and communication. To overcome barriers that hinder nurse-physician collaboration, communication and shared understanding are vital. Dispelling misconceptions, working around time and physical constraints, and embracing differences help to promote IPC early in physician training. Information gleaned from entries can be used to positively affect nurse-resident relationships and promote true collaboration based on mutual understanding and respect for the benefit of our patients.

## Discussion

Nurses and residents have similar perceptions regarding barriers and facilitators of interprofessional collaboration. Both feel a deeper understanding of the other will improve work relationships. Communication and relationship building are key to overcoming barriers. Social and formal processes play a large role in interprofessional collaboration. Information gathered in this study adds to our understanding of nurse-resident relationships and can guide future attempts to promote interprofessional collaboration. Potential interventions identified in this review are the broad implementation of relationship building endeavors during physician training such as formal interprofessional education programs, near proximity of workstations and team-centered/bonding activities. Additionally, knowledge sharing processes should be built into the

clinical learning environment through daily interprofessional education, shadowing experiences and open dialogue opportunities, i.e., family centered rounds.

- Relationship Building→familiarity→comfort→trust→respect→support→open communication→IPC
- Knowledge Sharing→role understanding→hierarchy understanding→respect→open communication→IPC

# References

Baldwin, D. C., & Daugherty, S. R. (2008). Interprofessional conflict and medical errors: Results of a national multi-specialty survey of hospital residents in the US. *Journal of Interprofessional Care, 22*(6), 573–586. https://doi.org/10.1080/13561820802364740

Fewster-Thuente, L. L. (2015). Working together toward a common goal: A grounded theory of nurse-physician collaboration. *Medsurg Nursing*, *24*(5), 356–362.

Interprofessional Education Collaborative Expert Panel. (2011). *Core competencies for interprofessional collaborative practice: Report of an expert panel*. Interprofessional Education Collaborative.

Manojlovich, M., Kerr, M., Davies, B., Squires, J., Mallick, R., & Rodger, G. L. (2014). Achieving a climate for patient safety by focusing on relationships. *International Journal for Quality Health Care, 26*(6), 579–584. https://doi.org/10.1093/intqhc/mzu068

McCaffrey, R., Hayes, R. M., Cassell, A., Miller-Reyes, S., Donaldson, A., & Ferrell, C. (2012). The effect of an educational programme on attitudes of nurses and medical residents towards the benefits of positive communication and collaboration. *Journal of Advanced Nursing, 68,* 293–301. https://doi.org/10.1111/j.1365-2648.2011. 05736.x

Weinberg, D., Miner, D., & Rivlin, L. (2009). 'It depends': Medical residents' perspectives on working with nurses. *American Journal of Nursing*, *109*(7), 34–43. https://doi.org/10.1097/01.naj.0000357167.63636.98

Weller, J. M., Barrow, M., & Gasquoine, S. (2011). Interprofessional collaboration among junior doctors and nurses in the hospital setting. *Medical Education, 45*(5), 478–487. https://doi.org/10.1111/j.1365-2923.2010.03919.x

Wright, M., Mankey, C., & Mille, B. (2013). Improving upon the 'July effect': A collaborative, interdisciplinary orientation for internal medicine interns. *Medical Education Online, 18*(1), Article 23249. https://doi.org/10.3402%2Fmeo.v18i0.23249

# Appendix C

## Prestudy 2: Intervention Program Reflective Journal Question Prompts

1. June Question: (KWL)
    a. What do you know about intern/nurse relationships?
    b. What do you want to know or learn as a result of this project?
2. July Question: What is the number one misconception about your role in the health care team?
3. August Question: What do you know about PDSA cycles?
4. September Question: What is one area of strength UHS/UTHSCSA has in building interprofessional teams?
5. October Question: What do you think is the largest roadblock in the promotion of inter-collaborative relationships in healthcare?
6. November Question: What do you really wish your buddy knew about you, pertaining to your role in healthcare?
7. December Question: Provide a real time example of how your buddy program/IPE interaction served to better patient care.
8. January Question: Offer one example of how the Buddy Program has enhanced or impaired your ability to work in teams.
9. February Question: Offer one suggestion on how to improve the buddy program.
10. March Question: What is the most important thing you learned from your buddy?
11. April Question: Would you recommend the Buddy Program to others? Why?
12. May Question: (KWL): What did you learn this year about nurse/intern relationships?

Appendix D

Pediatric Buddy Program Overview



The overall goal is to develop an interprofessional and collaborative working relationship between Pediatric residents and clinical nursing staff entitled “Pediatric Buddy Program”. The aims are identified through the learning objectives.

**Learning Objectives:**

- Foster the development of collegial nurse-resident relationships built on mutual respect and open communication.
- Establish true collaboration between nurse-residents to improve patient-care safety and quality.
- Dispel deeply rooted misconceptions between the two groups that serve to hinder patient care.
- Develop a clearer understanding of each other’s work pertaining to workflow processes, computer-based ordering, documentation, and hand-offs.
- Assist the interns in their adjustment to residency life and introduction to new medical system.
- Provide real-time clinical practice with the use of simulation cases. Introduce interns and nurses to ancillary services available as resources in the medical system and accreditation requirements for training.
- Develop a nurse and resident driven SBP quality improvement project (QI) centered on patient care, safety, and quality.

**Buddy Program Learning Activities and Didactics**

Orientation Week (June):
Day 1 - Buddy Program Welcome

- Pre-program survey
- Ice Breakers
- Create and Review "Top 10” Lists
- Program Introduction – expectations and outline
- Quality Improvement project introduction
- Team formation Exercise
- Nurse led hospital tour
- Buddy teams Scavenger Hunt
- Teambuilding Activity
- Buddy order input exercise
- Scripted exercises - Activity on communication skills, role playing activities between buddies; address proper hand-off and calling in consults using TeamSTEPPS model.

Day 2 - Buddy Program Orientation

- UHS Ancillary Fair – 30 different services present their service, introduce self and offer a fun prize or game.
- Simulation Activity – teams run through 8 stations based in team based clinical care needs such as Code Blue, Rapid Response to learn roles and highlight effective communication regarding patient care.
- Teambuilding Activity – communication styles and how they affect workflow.

Program Didactics

August

- Review of program expectations
- Overview of Project timeline and mentors
- Didactic: PDSA and QI Training
- Activity: Team based rounding overview
- Guest Speaker: Role Definition – Dean of Schools review of nurse and medical education, individual mission, and desire to enter field perspectives

September

- Didactic: Literature Reviews and EBM
- Activity: Teambuilding communication Role Play
- Didactic: Competencies, milestones, and benchmarks - integration into individual projects
- Project Check in

Oct

- Email check in with teams

November

- Welcome (review of orientation materials, purpose/expectations)
- Overview of Project – PDSA, Vision, Surveys, Implementation and Outcomes
- QI Training Module
- Activity - Bedside CSI – process and communication
- Closing

December

- Submit June – Dec journals
- Submit initial ortx checklist and PDSA with implementation plan
- Social with participants and families

January

- Welcome (review of materials–purpose/expectations)
- Overview project sections–forms, presentations, etc
    - Review research day dates and submission requirements
    - Review poster template
    - Review PPT template
- Overview of Projects
    - Review team's pre-assessment survey outcomes, implementation plan and discuss barriers
    - Review current PDSA cycle

    - Submit all pre-assessment surveys with your final packet
- Closing with ice breaker

February

- Individual team meetings to review project and move to completion

March

- Welcome
- Individual and Team check-in activity – self-reflection on group work, self-drive and collaborative attitudes
- Projects and Posters Outcomes
    - Team PPT presentations
    - PDSA Poster walk through
    - Practice poster talks for research day

April

- Research Day
- Debrief over judges' questions and celebration of award

May

- Review of program expectations and outcomes
- Lessons Learned exercise
- Journal reflection sharing
- Post Survey and TEEQ assessment
- Certificates and pins

Products/Assessments:

- Journals - Participants asked to journal once a month using the lead question provided. At the end of the year, they will share their journal with other nurses and interns to review perceptions and transfer of learning to improve group learning.
- QI Project: Teams use standard PDSA cycle on self-selected process-based issue. They are given a mentor and do weekly email check-ins to ensure forward progress. The final project is guided by a rubric for a standard team presentation at grand rounds, poster creation and submission to Pediatric Research Day.
- Pre/Post perception survey
- TEEQ overall project review
- Orientation Survey

# Appendix E

## Current Study Interview Questions

1. Can you tell me about your current practice environment, such as who is on your team?
2. The survey asked you to offer three examples of how your communication and collaboration with nurses/physicians was improved by participation in the program once in practice. Can you elaborate on why you believe the PBP specifically impacted your ability to communicate and collaborate with your nurse/physician counterparts?
3. Can you offer insight into a specific component of the PBP that offered you greater insight into your role on the healthcare team?
4. Can you offer insight into a specific component of the PBP that provided you skills to enter the workforce as a member of the IPE team you did not learn in formal education?
5. Can you offer insight into a specific component of the PBP that assisted you in providing better patient care?
6. What is one word you would use to describe the PBP?
7. Do you know if any of your nurse or physician colleagues in practice participated in a similar IPE program during their graduate training? If so, what do you know about it?
8. Have you experienced conflict with your nurse/doctor counterparts?
9. As a practicing nurse/doctor, did you observe any specific actions taken by the employers to address the issue?
10. Tell me more about your relationship with your peers and nurses at work.
11. Tell me more about how you have dealt with IPE conflict in practice.
12. Can you talk about your experience in the Pediatric Buddy program (PBP)?
13. What stood out to you as the defining characteristic of the program?

# Appendix F

## IRB Approval Notice

UNIVERSITY OF THE INCARNATE WORD

December 22, 2021

To: Ms Elizabeth Wueste

From: University of the Incarnate Word Institutional Review Board, FWA00009201

Elizabeth:

Your request to conduct the study titled A Concurrent Exploratory Mixed Methods Study: The Impact of a Physician and Nurse Interprofessional Education Program was approved by exempt review on 12/22/2021. Your IRB approval number is 21-12-002. You have approval to conduct this study through 12/22/2022.

Please keep in mind the following responsibilities of the Principal Investigator:

1. Conducting the study only according to the protocol approved by the IRB.
2. Submitting any changes to the protocol and/or consent documents to the IRB for review and approval prior to the implementation of the changes. Use the **IRB Amendment Request** form.
3. Ensuring that only persons formally approved by the IRB enroll subjects.
4. Reporting immediately to the IRB any severe adverse reaction or serious problem, whether anticipated or unanticipated.
5. Reporting immediately to the IRB the death of a subject, regardless of the cause.
6. Reporting promptly to the IRB any significant findings that become known in the course of the research that might affect the willingness of the subjects to participate in the study or, once enrolled, to continue to take part.
7. Timely submission of an annual status report (for exempt studies) or a request for continuing review (for expedited and full Board studies). Use either the **IRB Study Status Update** or **IRB Continuing Review Request** form.
8. Completion and maintenance of an active (non-expired) CITI human subjects training certificate.
9. Timely notification of a project's completion. Use the **IRB Closure** form.

Approval may be suspended or terminated if there is evidence of a) noncompliance with federal regulations or university policy or b) any aberration from the current, approved protocol.

If you need any assistance, please contact the UIW IRB representative for your college/school or the Office of Research Development.

Sincerely,

Mary Jo Bilicek
Research Compliance Coordinator
University of the Incarnate Word
(210) 805-3565
bilicek@uiwtx.edu