Interprofessional Collaboration: Perceptions and Practice in Healthcare Providers

Gail L. Adkins
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Florida State University
Abstract

**Purpose:** This project explored the current perception and level of interprofessional collaboration (IPC) among healthcare providers in the sample population. It also investigated if a change in perception (or knowledge of definition) occurred after viewing a brief education intervention, measured the baseline level of IPC, and baseline comparisons of the variables.

**Methods:** The Assessment of Interprofessional Team Collaboration Scale for Practitioners (AITCS-II) was used to measure level of IPC, and a questionnaire was developed to evaluate current perception (or knowledge of definition) of IPC before and after viewing the educational intervention. The level of IPC among those participants with “correct” perceptions of IPC was compared. Independent samples t-tests and cross tabulation was applied to evaluate and summarize relationships between the variables.

**Results:** Nineteen respondents participated in the project. 52.6% indicated a favorable pre-intervention perception (or knowledge of definition) of IPC, with a post-intervention increase of 10%. Overall AITCS-II measure of level of IPC indicated movement toward collaboration. Comparison of level of IPC measurements with correct definition of perception (or knowledge of definition) of IPC reported a mean score (82.2) versus those with an incorrect perception (96.5).

**Discussion:** These results, albeit small, may indicate positive movement toward authentic IPC, though inference is strongly cautioned. Consistent lower mean levels of IPC among respondents with ‘correct’ perception may be attributed to a greater understanding of the authentic concept of IPC, signaling a lesser level of IPC may be occurring in earnest in these practice settings. AITCS-II subcategory analyses also indicated potential incongruencies related to leadership.

**Conclusions:** Progressive shifts towards IPC may be underway. Ongoing appraisal and education are suggested for its continued successful integration.
In 1972 the Institute of Medicine (IOM) pointed to a team-based patient care model as a means to improve patient safety, as well as encourage interprofessional communication (National League for Nurses, 2015). Since then, the IOM and other healthcare governing/leadership bodies have continued to pursue strategies aimed to improve healthcare in the United States (US). For instance, in 1998, the IOM’s Committee on the Quality of HealthCare in America, was tasked with outlining a strategy to improve quality of care, identify barriers to quality, and investigate systems approaches that would facilitate needed changes for the upcoming decade (IOM Committee on Quality of Health Care in America, 2001). The committee concluded that evidence-based practice and patient-centered care that spanned across health care providers and settings was necessary to improve quality in the upcoming decade (IOM Committee on Quality of Health Care in America, 2001). In 2007, The Institute for Healthcare Improvement (IHI) developed a conceptual framework designed to optimize health system performance, focused on three areas: population health improvement; improved patient satisfaction/experience; and health care cost reduction, known as “The Triple Aim” (Berwick, Nolan, & Whittington, 2008). Berwick and colleagues (2008) also outlined obstacles and preconditions necessary to move forward with a redesign of primary care services and structures. One such change suggested a shift from a physician-led or sole-physician traditional model of care to a team approach with shared coordination and plans of care (Berwick, Nolan, & Whittington, 2008).

**Problem Statement**

Creative strategies and innovative approaches to healthcare delivery continue to be in high demand in order to meet community health needs and maximize health resources. Interprofessional collaborative practice (IPC) has been suggested to improve access and
coordination of care, improve outcomes for patients diagnosed with chronic diseases, and improve patient safety (World Health Organization, 2015). In addition, IPC may engender a practice environment in which greater professional satisfaction and maximization of professional skills and expertise across disciplines are more readily available, utilized, and synergized in the provision of patient care. The challenge of caring for increasingly complex patients with multiple co-morbidities amidst rising cost of healthcare underscores the need for such strategies and innovations. IPC is an approach to patient care in which two or more healthcare professionals belonging to different disciplines work together to provide comprehensive, high quality, patient-centered care to patients and families across various settings (WHO, 2010). In alignment with the IOM and the WHO, IPC education has been added to health profession degree program curricula across colleges and university campuses in the US in recent years. In 2009, The Interprofessional Education Collaborative (IPEC) was established in an effort to develop and prepare health professions students for team-based care to improve population health outcomes, among other potential benefits (IPEC, 2016). Originally comprised of six national education associations of schools of health professions, IPEC currently represents more than twenty national associations committed to IPEC’s Interprofessional Collaboration Competencies domains (teamwork/team-based practice, communication, roles/responsibilities, and value/ethics) to guide academic curricula development in an effort to best prepare students from a variety of health-related disciplines to engage in IPC in the clinical practice setting (IPEC, 2016).

It has been nearly fifty years since the IOM’s nod towards team-based patient care delivery models, and over ten years since the inception of the IPEC. Are IPC education and healthcare governing/leadership recommendations transcending from academia and committees into clinical
practice? In order for this type of care delivery to be impactful, successful team functioning and optimization of all available resources is essential (Poghosyan, Norful, & Martsolf, 2017).

**Statement of Purpose**

The purpose of this project was to explore current interprofessional collaborative practices of physicians (medical doctors or doctors of osteopathy), nurse practitioners (NP), and physician assistants (PA). Specifically, the project investigated the perception (or knowledge of the definition of) at baseline, applied a brief educational intervention on the topic of interest, and after which assessed for a change in ‘perception’ (or knowledge of the definition of) IPC. This project also set out to appraise the level of interprofessional collaboration among participants at baseline, and to then compare the ‘level’ of IPC with correct (versus incorrect) ‘perceptions’ (or knowledge of the definition) of IPC among physicians, NPs, and PAs in the sample population.

**Clinical Question**

Among physicians, NPs, and PAs in the sample population, what is the perception (or knowledge of the definition) of IPC, the current level of interprofessional collaboration among them, will an educational intervention change the perception (or knowledge of definition) of IPC within this group of professionals, and is there a correlation between level of interprofessional collaboration and perception (or knowledge of the definition of) interprofessional collaboration among participants?

**Aims**

This quality improvement project aimed to achieve the following:

1. Assess participant perceptions of IPC (or knowledge of the definition of) at baseline.
2. Assess the level of IPC as measured by the *Assessment of Interprofessional Team Collaboration Scale-II* (AITCS-II) at baseline.
3. Determine if the educational intervention resulted in a change in perception (or knowledge of the definition) of IPC.

4. Compare the level of IPC among those who had correct (versus incorrect) perceptions (or knowledge of the definition) of IPC.

**Review of the Literature**

Research on the topic of interest largely identified factors that may engender positive perceptions related to IPC, as well as those that may hinder those perceptions, producing beneficial findings on the general topic. Synthesis of the literature elucidated several common themes. Positive influencers, factors that appeared to foster positive perceptions of IPC, included physical/structural environment and receptiveness toward IPC. Factors associated with negative perceptions of IPC, negative influencers, were related to differences in perceptions of IPC, residual hierarchical tendencies, and organizational impacts.

**Positive Influencers**

*Physical/structural environment*

Research suggested physical/structural environment may foster a positive perception of IPC (Norful, Ye, Van der-Biezen, & Poghosyan, 2018; Poghosyan, Norful, & Martsoff, 2017; Rousseau, Pontbriand, Nadeau, & Johnson-Lafleur, 2017; Schadowaldt McInnes, Hiller, & Gardener, 2016; Szafran, Kennett, Bell, & Torti, 2019; Wranik, et al., 2019). Frequent, timely, and effective communication between providers was essential for successful collaboration. Face-to-face communication/consultation and telephone calls were indicated as the preferred and most often utilized forms of communication between physicians and NPs in a shared practice setting (Norful, et al., 2018; Schadowaldt, et al., 2016). Studies also supported provider access to other providers enhanced IPC (Szafran, et al., 2019), and was significantly associated with more
positive perceptions of IPC (Rousseau, et al., 2017). Similarly, shared workspace and/or close proximity to collaborating providers within a practice setting provided for time to collaborate, formally or informally, and also allowed for timely second opinions (Norful, et al., 2018). Wranik, et al. (2019) also found robust qualitative evidence to support shared space as a positive characteristic in team/collaborative processes. Sinuous task-shifting was also able to occur between NPs, PAs, and physicians in a shared setting. In doing so, collaboration/co-management of patients provided opportunity to deliver care in a timelier manner (Poghosyan, et al., 2017). Close proximity/co-location was also found to boost the perception of professional power, improve communication, and encourage a favorable perception of the organizational culture (Rousseau, et al., 2017). Regular interaction between interprofessional team members facilitated collaboration through greater opportunity to discuss patient care issues, exchange information, and shift care, if necessary, to the provider with greater expertise (Szafran, et al., 2018). Conversely, Schadewaldt, et al. (2016) found that workspace which was either ill-equipped (i.e. lacking a designated area of privacy and/or adequate seating), or NPs and physicians that were not co-located regularly, proved to be challenge to effective collaboration. Within the same study, both NPs and physicians did convey positivity regarding collaboration, reported high levels of such, and satisfaction in the collaborative relationship, at least during times when communication was able to occur. Physicians and NPs also held the same belief that collaboration was beneficial to patients (Schadewaldt, et al., 2016).

Receptiveness to IPC

A receptiveness to the concept of IPC was determined to be a positive influencer among providers (Bridges, 2014; Dahl & Crawford, 2017; Johnson & Mathieson, 2020; Norful, et al., 2018; Morton, et al., 2016; Poghosyan, et al., 2017; Schadewaldt, et al., 2016). Receptiveness,
evidenced by approachability, a willingness to share and cooperate, collegial coordination of care, taking responsibility for care, and autonomy suggested promotion of positive perceptions and beliefs of IPC (Bridges, 2014). In a recent qualitative study, physicians believed that changing their model of care delivery to a collaborative model, to include NPs, would improve patient care (Schadowaldt, et al., 2016). Because of the belief, they were committed to its success. Over time, both physicians and NPs agreed that receptiveness to IPC and mutual professional respect led to successful integration of IPC. In recent mixed methods studies, data analysis revealed similar findings (Poghosyan, et al., 2017; Stadick, 2020). Favorable relationships related to IPC between physicians and NPs were created. Relationships were characterized by an open-minded attitude toward IPC, trust, respect, and ongoing communication (Ansa, et al., 2020; Poghosyan, et al., 2017; Stadick, 2020). The same study reported that, over time, mutual reciprocity and equity transpired. In addition, bi-directional consultation/input and patient care discussions were ongoing, resulting in the development of an effective interprofessional collegial team. Norful, et al. (2018) reported that NPs and physicians in practice together recounted that they, through collective expertise and experience, believed patient care quality was improved. In addition, it was also suggested that provider strain was reduced, and burnout prevented. Time and receptive attitudes to interprofessional team development also assisted in diminishing hierarchical cultures (Morton, et al., 2016).

Negative Influencers

Differing perceptions of IPC

Recent literature suggested a favorable perception of IPC across professional disciplines, as well as the belief that IPC was currently being utilized in various practice settings. However, the literature also suggested that perceptions of IPC across disciplines differed, potentially
contributing to misunderstandings and failures in authentic collaborative practice (Bridges, 2014; Matziou, et al., 2014; Schadewaldt, et al., 2016; Sollami, Caricati, and Sarli, 2015; Szafran, et al., 2018). The phenomenon was demonstrated in a recent study. Physicians reported IPC as both evident and positive within their practice environment. Nurses within the same practice responded less enthusiastically, with findings also signaling desire for a greater degree of IPC (Sollami, et al., 2015). It should be noted that the study was undertaken in the context of physicians and nurses (versus NPs); however, the differing perceptions of IPC between the disciplines were clear. Physicians may perceive frequent communication and shared decision-making as more of a convenience versus a priority when engaging in collaborative care with NPs, also demonstrating varying perceptions of IPC between the disciplines within the same practice environment (Schadewaldt, et al., 2016). In another study, family physicians reported their role within the interprofessional primary care teams was that of the leader, responsible for coordinating and delegating to other healthcare professionals within the team, while other members of the interprofessional team disagreed (Szafran, et al., 2018). In the same study, physicians reported that, while they did listen and consider the professional input of others within the interprofessional team, final decision-making regarding patient care was not shared, and rested with the physician’s decision. The aforementioned perceptions exemplify a more traditional model of care rather than IPC. The physicians’ description of their role within the interprofessional care team rather served to exemplify the antithesis of IPC, and further illustrated conflicting perceptions and knowledge deficits of collaborative care among interprofessional team members. Matziou, et al. (2014) found that the paternalistic medicine-centered care model remained prevalent and pointed to differing views of collaboration between those with medicine and nursing backgrounds. Differing perceptions of IPC among healthcare
professionals within a common practice setting may lead to misunderstandings, incite professional tension between disciplines, and ultimately undermine the value of IPC, as demonstrated in the literature.

**Hierarchical Tendencies**

Authentic collaboration was challenged within the practice setting due, in part, to familiarity of the more traditional, hierarchical medical model of care delivery (Alcusky, et al., 2016; Allen, Elliott, & Jackson, 2017; Bridges, 2014; Dahl & Crawford, 2017; DiCicco-Bloom & Cunningham, 2015; Lackie & Murphy, 2020; Matziou, et al, 2014; Piers, et al., 2017; Schadewaldt, et al., 2016; Sollami, et al., 2015; Szafran, et al., 2018; Van der-Biezen, et al., 2017). Traditional models of care impeded effective IPC between disciplines, certainly between physicians and NPs, and may have contributed to the interpretation of disrespect to the latter (Bridges, 2014). Compared to physicians, NPs under study described ‘respect’ as the physician’s ability to recognize NP scope of practice, as well as unencumber their autonomy (Norful, et al., 2018). Impediments to effective collaboration threaten more than morale. Hierarchical tendencies may also contribute to poor communication between providers, resulting in negative patient outcomes. Refusal to share essential patient information, refusal to answer questions regarding patient care, and overall hostile interactions that break down communication between the various disciplines may contribute to delays in patient care, lack of continuity of care, duplication of services, and patient dissatisfaction, among others (Bridges, 2014; Di-Cicco & Cunningham, 2015; Matziou, et al., 2014).

**Organizational Impacts**

Organizational impacts were determined to be negative influencers to perceptions of IPC (Bridges, 2014; Dahl & Crawford, 2018; Di-Cicco Bloom & Cunningham, 2015; Lackie &
System structures related to policy and practice may hinder positive perceptions surrounding collaboration between physicians and NPs (Schadewaldt, et al., 2016). For example, unequal payor structures and mandatory collaborative arrangements between NPs, PAs, and physicians subtly perpetuate hierarchical tendencies, thus undermining authentic IPC. Organizational policies may inhibit best use of NPs by adopting institutional processes that inadvertently underutilize the NP’s skillset. (Di-Cicco-Bloom & Cunningham, 2015). Support for IPC through ongoing allocation of time and resources to ensure optimism and successful implementation must be present at the organizational level (Dahl & Crawford, 2018). The inaction of organizations to develop IPC through effective IPC strategies and institution-wide education/training may signal complacency in traditional hierarchical models of health delivery (Matziou, 2014). Poghosyan, et al. (2017) found that, of NP participants under study, the majority did not believe administrators treated physicians and NPs as equals, and organizational resources were not shared equally between physicians and NPs. Also, confusion surrounding scope-of-practice, inconsistent legislation across states, lack of clarity regarding the role of the NP (Cote, Freeman, Jean, & Denis, 2019; Josi, Bianchi, & Brandt, 2020; Stadick, 2020; Torrens, et al., 2020) and billing practices that obscure NP economic contributions also act as negative influencers to IPC (Poghosyan, et al., 2017).

**Strengths**

Similar findings across various settings, disciplines, and countries provide strong evidence these findings are valid. Findings included in the review are current, within the past five years, and therefore represent the most up-to-date data on the subject of inquiry. Studies included in the
review were of good to high quality, as determined by the Johns Hopkins Evidence-Based Practice (EBP) tools.

**Limitations**

Review of the literature generated global findings. Studies took place in Canada, Italy, the Netherlands, Australia, Belgium, Switzerland, Norway, the United Kingdom, United States, and Greece. Generalizability may be limited. It is not known what influence other healthcare structures and cultures exert. Also, lack of consensus exists globally regarding educational backgrounds, competencies, and titles related to ‘nurse’, ‘nurse practitioner’, ‘physician’, ‘physician assistant’, ‘general practitioner’, and ‘medical practitioner’, and ‘specialist’. It is therefore unknown whether comparative professional titles translate to that of United States’ healthcare providers. Lastly, review of the literature did not address ongoing evaluation of level of knowledge of IPC in the clinical setting among physicians, NPs, and PAs in the US.

**Gaps in the Literature**

Few studies were found that concentrated exclusively on NP, PA, and physician relationships. Furthermore, the current clinical setting, and backdrop of such relationships, and the dynamics that accompany those relationships, was lacking. Also, although interprofessional education (IPE) was frequently recommended in the literature (Alcusky, et al., 2016; Ansa, et al., 2020; Bridges, 2014; Matziou, et al., 2015; Sollami, et al., 2015; Stadick, 2020; Szafran, et al., 2018; Treadwell, et al., 2015; Van der-Biezen, et al., 2017), the review located only one IPE (Treadwell, Binder, Symes, and Krepper, 2015). The study, an experimental research study, conducted IPE and training in the workplace, and was then evaluated. Results indicated educating teams about IPC tools and techniques may be a useful strategy to develop and promote IPC in practice (Treadwell, et al., 2015). Evaluation of the IPEC *Core Competencies for*
Interprofessional Collaborative Practice: 2016 (IPEC, 2016) within practice settings was not found within the review of the literature as a means to evaluate provider knowledge of authentic IPC characteristics and competencies, and therefore it is unclear if IPC occurs in earnest between the disciplines. In a recent systematic review with narrative synthesis, Wranik, et al. (2019) did report strong quantitative evidence that the addition of new models of care and new providers within the clinical setting was associated with improvements in providing recommended tests and preventative care, as well as reductions in hospital care.

Synthesis of the literature elucidated common themes. Positive influencers of IPC included the physical/structural environment, and receptiveness to IPC. Negative influencers involved differing perceptions of IPC between the disciplines, residual hierarchical tendencies, and organizational impacts. It is posited that IPC/team-based models of care delivery may maximize the delivery of appropriate, cost-effective, patient-centered care (IPEC, 2016). Although efforts to initiate changes in care delivery through legislation and accreditation bodies continue, changes in culture take time and training (Treadwell, et al., 2015).

Theoretical Framework

Lewin’s Change Theory was used as the theoretical framework to guide the project. Lewin theorized that prior learning, formal and informal, must be discarded and replaced with new information in order for change to occur. Stages of the model include the unfreezing-change-refreezing of information. Main concepts of the theory involve driving forces, restraining forces, and equilibrium (Petriprin, 2016). Lewin’s theory was illustrated in findings from the literature review. For example, removal of long-held hierarchical beliefs in healthcare in order to be replaced with beliefs more aligned with collaborative practices and solidified (“refreezing”) with ongoing education resources. Driving forces and restraining forces in the theory were relatable to
the findings detailed within the literature review, including barriers and facilitators surrounding the implementation of IPC. Change theory was used, too, in guiding intervention constructs, as well as the intervention on the topic.

Methodology

This quality improvement project explored the following aims:

1. Assess participant perceptions of IPC (or knowledge of the definition of) at baseline
2. Assess the level of IPC as measured by the AITCS-II at baseline
3. Determine if the educational intervention resulted in a change in perception (or knowledge of the definition) of IPC
4. Compare the level of IPC among those who had correct (versus incorrect) perceptions (or knowledge of the definition) of IPC.

Design

This QI project used a descriptive, quasi-experimental one-group pretest posttest design. It took place online-only in an effort to minimize disruption in clinic/provider workflow and provision of patient care. The project utilized descriptive statistics to assess all aims. In addition to descriptive statistics, aims three and four implemented inferential statistics. There were two distinct variables of interest within the project: perception (or knowledge of the definition) and level of interprofessional collaboration among physicians, NPs, and PAs in the sample population. This method was appropriate because it elucidated perceptions (or definition of the knowledge) of participant physicians, NPs, and PAs before and after an educational intervention on the topic of interest, as well as to measure the level of interprofessional collaboration at the time of participation. This type of design may be straightforwardly repeated in the future to
evaluate the effectiveness of continuing education programs on the topic of IPC among participants.

Participants

A nonprobability sampling method, convenience snowball sampling, was used to recruit study participants. The initial sampling frame included practicing physicians, NPs, and PAs in a healthcare system with locations in several states including Florida, New Jersey, Texas, and Georgia. The Regional Director of Operations for central and northern regions of Florida served as the point-of-contact/facilitator throughout the project implementation. He also agreed to act as a liaison/facilitator in extending email participation to two additional comprehensive acute and chronic pain management healthcare organizations. Participants in the opening sampling frame were emailed an introduction/invitation to participate, with the survey link embedded within the correspondence. Participants were invited to forward the email to colleagues who met the criteria of a currently practicing physician (MD or DO), NP, or PA, and consented to participation. A $100 Amazon gift card drawing was extended to those individuals who participated in the pre-intervention, post-intervention, and follow-up survey approximately six weeks after the initial survey participation in an effort to bolster recruitment.

The participants continued onto the demographic collection, Perceptions Survey at baseline, and AITCS-II survey instrument was completed for baseline measurement of level of teamwork collaboration.

Setting

Data collection occurred between October of 2020 and December of 2020. An introduction/invitation email (Appendix A) was distributed via Qualtrics, an online software survey tool, to the initial sampling frame with an embedded hyperlink to the survey contents.
Consent to participation was necessary prior to accessing the survey content. A ‘yes’ response allowed survey access/participation. A ‘no’ response ended the survey. The survey consisted of four parts: (1) Demographics collection (2) Pre-Intervention IPC Perceptions Survey (Appendix B) (3) Embedded Animated/Narrated Educational Intervention and (4) Post-Intervention IPC Perceptions Survey (re-administration of Appendix B). Participation in the survey was entirely voluntary, with the ability to withdraw at any time. This information was explicitly stated within the introductory/invitation email. On completion of all portions of the survey, participants were invited to participate in a follow-up survey (re-administration of Appendix B) scheduled approximately six weeks after initial participation. Participants who opted-in by providing an email address received a follow-up survey email approximately six weeks later (Appendix C) with a hyperlink to the one-question survey.

**Instruments**

There were two distinct variables of interest within the project: ‘perception’ (or knowledge of the definition of) and the current ‘level of interprofessional collaboration’ among team members. Two surveys were utilized to measure these variables. The first variable, perception (or knowledge of the definition of), was measured at a nominal level with a Perceptions Survey (Appendix B) created by the principal investigator and reviewed by the in-house statistician at Florida State University’s College of Nursing. The variable ‘perception’ was measured prior to participation in the education intervention and re-appraised immediately following participation in the intervention to evaluate for change, addressing aim one and aim three. It was then re-applied six weeks later to those individuals who opted-in to participate in the one-question survey to evaluate for sustained change in perception (or knowledge of the definition) of IPC.
The second variable, ‘level of interprofessional collaboration’ was measured by the *Assessment of Interprofessional Team Collaboration Scale-II* (AITCS-II) instrument (Appendix D). The AITCS-II was developed specifically to measure the level of interprofessional collaboration among team members, based on the Canadian Interprofessional Collaborative (CIHC), and congruent with IPEC’s *Core Competencies*. Participant level of IPC was measured using a 5-point Likert Scale prior to application of the intervention. The AITCS-II reported a Cronbach alpha coefficient of .89 with reliability estimates spanning various healthcare settings. Construct validity was established via exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) (Orchard, 2015). Email correspondence was established with the developer of the AITCS-II, Dr. Carole Orchard, BSN, MEd, EdD, and permission was given for use of the tool. The level of IPC among those participants who had correct (versus incorrect) perceptions (or knowledge of the definition) of IPC was then compared to achieve aim two and aim four of the project.

**Educational Intervention**

A brief educational intervention was created by the principal investigator and presented in an animated format, with narration overlay, and embedded within Qualtrics. The intervention was reviewed prior to dissemination by the in-house statistician for Florida State University’s College of Nursing, as well as the principal investigator’s Major Professor. Animation was the chosen medium in an effort to engage participants, emphasize important areas of content, and control information-timing in the presentation. Content brevity-target was less than five minutes to encourage participant attention and completion. The animation software, “Doodly”, was used to create the presentation. The script was guided by Lewin’s Change Theory, as well as IPEC’s updated *Core Competencies* domains. The presentation provided an overview, potential benefits,
and representative behaviors of authentic IPC. Representative behaviors in the presentation mirrored those in the pre-intervention Perceptions Survey (Appendix B). IPC concepts were compared to similar-type concepts such teams versus groups; cooperation versus collaboration; and hierarchical versus authentic collaborative team models of healthcare in order to illustrate key aspects of authentic IPC.

**Human Subject and Informed Consent**

The FSU Institutional Review Board (IRB) approval was obtained prior to the initiation of the project. FSU’s Office for Human Subjects Protection (OHSP) and IRB’s purpose is to protect the rights and welfare of human subjects (FSU Office for Human Subjects Protection, 2019). The IRB reviewed and determined this project’s fitness to proceed with an exempt status, based on the ethical principles and laws that govern protection of human subjects (Appendix E). Participation in this study was completely voluntary, participants were able to withdraw at any time, and consent to participate was embedded in the Qualtrics survey platform was necessary prior to access to the survey. Potential risks and benefits pertaining to this project were considered. In order to minimize emotional risk, participants were able to withdraw from the project at any time, for any reason, and was made explicit to participants. In order to minimize the risk of a breach of confidentiality, no non-essential personally identifiable information was collected, and all necessary personally identifiable information was de-identified.

**Data Analysis**

Data analysis was performed using IBM’s SPSS for Mac, Version 25 software. The data collected from Qualtrics survey software was uploaded into SPSS, de-identified, organized, and analyzed. Descriptive statistics was used to assess all aims. In addition to descriptive statistics, aims three and four implemented inferential statistics. The data was analyzed and evaluated
using independent samples t-tests and cross tabulation to evaluate and summarize relationships between the variables of interest. Demographic data including profession, level of education, gender, age, and years-in-practice, years-in-current-role was collected and used to explicate participant characteristics.

Results

Demographics

Convenience snowball sampling was used to recruit study participants. The initial sampling frame included fifty-one practicing physicians, NPs, and PAs in a healthcare system with locations in several states including Florida, New Jersey, Texas, and Georgia, as well as two additional comprehensive acute and chronic pain management healthcare organizations. Reflective of convenience snowball sampling, the initial email included language to encourage participants to share the survey with other colleagues who may be interested in participation in order to bolster respondent numbers (Appendix A). In addition, one respondent who was included in the initial sampling frame provided the principal investigator (PI) with thirty additional colleague email addresses. In total, eighty-one discrete emails were distributed via Qualtrics. Of these email invitations, twenty-three started the survey, twenty provided demographic information, and nineteen respondents completed the survey (82.6%, Tables 1-4), for an overall response rate of 23.5%. The majority of respondents were physicians (n=9, 45%), followed by PAs (n=6, 30%) and NPs (n=5, 25%) respectively. Respondents were equally represented with respect to gender (n=10, 50% female, n=10, 50% male) and highest level of education completed (n=10, 50% Master’s degree, n=10, 50% Doctoral degree). The median age of participants was 49.5 years (\( \bar{x} \) 47.55, SD 12.5). The median participant years-in-practice was
ten years ($\bar{x}$ 15.5, SD 13.3), with a broad range in years-in-current-role spanning three months to thirty-three years ($\bar{x}$ 6.85, SD 9.3).

**Tables 1-4: Summary of Participant Demographics**

**Table 1: Professional Discipline**

<table>
<thead>
<tr>
<th>Professional Discipline</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid Physician Assistant</td>
<td>6</td>
<td>30.0</td>
<td>30.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Nurse Practitioner</td>
<td>5</td>
<td>25.0</td>
<td>25.0</td>
<td>55.0</td>
</tr>
<tr>
<td>Physician</td>
<td>9</td>
<td>45.0</td>
<td>45.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2: Current age of Provider**

<table>
<thead>
<tr>
<th>Participant Age</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
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<tbody>
<tr>
<td>What is your current age?</td>
<td>20</td>
<td>27</td>
<td>66</td>
<td>47.55</td>
<td>12.538</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

**Table 3: Years in Practice**

<table>
<thead>
<tr>
<th>Years-In-Practice</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many years have you been in practice? Please enter only the number of years rounded to the nearest quarter of a year (e.g. 3 months=0.25 years, 6 months=0.5 years, etc.)</td>
<td>20</td>
<td>.25</td>
<td>39.00</td>
<td>15.4500</td>
<td>13.29315</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 4: Years in Current Role**
Participant Perceptions of IPC

The first aim queried participant perceptions of IPC (or knowledge of the definition of) at baseline. Participants were asked to choose one of four statements most representative of their perception of IPC. Statement three mirrored the IPEC definition of IPC. The remaining three choices were similar statements; however, were more so representative of the concepts of group (versus team), cooperation (versus collaboration), and traditional care models. These same concepts then served as the foundation and focus for the brief educational intervention.

A total of twenty respondents initiated the pre-intervention survey. One response was missing (n=1, 5%, Table 5). The majority of respondents (n=10, 50%) chose the statement most aligned with the IPEC’s definition of IPC. The second-most frequently chosen statement reflected cooperation (n=6, 30%). The remainder of responses chose statements more representative of traditional patient care models (n=2, 10%) and group versus team attributes (n=1, 5%).

Table 5

Pre-Intervention IPC Perception
The second aim was to determine the level of IPC at baseline, measured by the AITCS-II diagnostic instrument. Participant level of IPC was measured using a 5-point Likert-type scale (1=Never; 2=Rarely; 3=Occasionally; 4=Most of the Time; 5=Always). The mean, standard deviation, and sum of each subscale item, as well as the overall collaboration scale was calculated. A mean score of $\geq 4.0$ indicated good collaboration; 3.0-3.9=moving towards collaboration; and 1.0-2.9 suggested the need to focus on developing collaborative practice (Orchard, 2015).
There were three subscales within the tool: partnership, cooperation, and coordination. The first category addressed partnership related to IPC. Eight categories included in the subscale was evaluated. Respondents indicated the greatest collaboration was evidenced by the inclusion of patients when setting goals for their healthcare (\( \bar{x} 4.32, SD 1.003, \text{Table 7} \)). Three additional subscale scores in part one of the AITCS-II tool also indicated good collaboration among team members including: listening to the wishes of the patient when determining the process of care chosen by the team (\( \bar{x} 4.26, SD 0.933 \)); working with the patient/family when making adjustments to care plans (\( \bar{x} 4.11, SD 1.049 \)); and encouraging team members, patients, and their family members to use unique knowledge and skills when developing plans of care (\( \bar{x} 4.05, SD 1.026 \)). Respondents also indicated movement towards IPC when the team was involved in goal-setting for each patient (\( \bar{x} 3.89, SD 1.049 \)), use of consistent communication with team members to discuss patient care (\( \bar{x} 3.89, SD 0.994 \)), meeting and discussing patient care on a regular basis (\( \bar{x} 3.63, SD 1.116 \)), and coordination of health and social services based on patient care needs (\( \bar{x} 3.32, SD 1.057 \)). The overall mean of the ‘partnership’ category score was calculated with a result of 3.93.

The second category of the diagnostic tool concentrated on cooperation related to IPC among team members in the workplace setting. Respondents indicated equally good collaboration among their teams related to respect and trust (\( \bar{x} 4.37, SD 0.955 \)) and the understanding of shared knowledge and skills between healthcare providers on the team (\( \bar{x} 4.37, SD 0.955 \)). Respondents also indicated good collaboration in terms of openness and honesty (\( \bar{x} 4.32, SD 0.946 \)), a sense of trust among team members (\( \bar{x} 4.26, SD 0.933 \)), and understanding the boundaries of what each team member was capable of (\( \bar{x} 4.0, SD 0.882 \)). Good movement towards collaboration was suggested in the areas that dealt with achieving mutually satisfying solutions to differing
opinions ($\bar{x}$ 3.95, SD, 0.911), sharing power among team members ($\bar{x}$ 3.74, SD 1.046), and making changes to team functioning based on reflective reviews ($\bar{x}$ 3.68, SD 1.057).

The final category focused on coordination among team members. Respondent scores reflected good collaboration was taking place in several areas of their workplace teams, most notably in support for varying of the team leader depending on the needs of the patient ($\bar{x}$ 4.25, SD 0.910). The lowest subscale score pertained to the mutual agreement on selection of the team leader ($\bar{x}$ 2.90, SD 1.447). Respondents reported good collaboration through encouraging and supporting open communication (including patients/families) during team meetings ($\bar{x}$ 4.20, SD 0.894) and the use of an agreed upon process to resolve conflicts ($\bar{x}$ 4.0, SD 0.918). Movement towards good collaboration was indicated on the subject of equal division of agreed upon goals among team members ($\bar{x}$ 3.65, SD 0.933), application of a unique definition of Interprofessional collaborative practice to the practice setting ($\bar{x}$ 3.50, SD 1.147), and openly supporting the inclusion of the patient during team meetings ($\bar{x}$ 3.20, SD 1.152). The overall level of IPC scale among the respondents was calculated at 3.90.
### Table 7

**AITCS-II Results Summary**

AITCS-II: Part 1: Partnership. When we are working as a team all of my team members...

<table>
<thead>
<tr>
<th>Item</th>
<th>N</th>
<th>Valid</th>
<th>Missing</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>include patients in setting goals for their care.</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>listen to the wishes of their patients when determining the process of care chosen by the team.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>meet and discuss patient care on a regular basis.</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>coordinate health and social services (i.e. financial, occupation, housing, spiritual) based upon patient care needs.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>use consistent communication with to discuss patient care.</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>are involved in goal setting for each patient.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>encourage each other and patients and their families to use the knowledge and skills that each of us can bring in developing plans of care.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>work with the patient and his/her relatives in adjusting care plans.</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
</tbody>
</table>

AITCS-II: Part 2: Cooperation. When we are working as a team all of my team members...

<table>
<thead>
<tr>
<th>Item</th>
<th>N</th>
<th>Valid</th>
<th>Missing</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>share power with each other.</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>respect and trust each other.</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>are open and honest with each other.</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>make changes to their team functioning based on reflective reviews.</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>strive to achieve mutually satisfying resolution to differences of opinions.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>understand the boundaries of what each other can do.</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>understand that there are shared knowledge and skills between health providers on the team.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>establish a sense of trust among the team members.</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
</tbody>
</table>

AITCS-II: Part 3: Coordination. When we are working as a team all of my team members...

<table>
<thead>
<tr>
<th>Item</th>
<th>N</th>
<th>Valid</th>
<th>Missing</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>apply a unique definition of interprofessional collaborative practice to the practice setting.</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>equally divide agreed upon goals amongst the team.</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>encourage and support open communication, including the patients and their relatives during team meetings.</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>use an agreed upon process to resolve conflicts.</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>support the leader for the team varying depending on the needs of our patients.</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>together select the leader for our team.</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>openly support inclusion of the patient in our team meetings.</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>
Educational Intervention and Change in Perception of IPC

The third aim of the project was to determine if the brief education intervention would result in a change in perception (or knowledge of the definition) of IPC. Pre-intervention and post-intervention survey results were re-assigned dichotomous variables of either “correct” or “incorrect” and evaluated. Cross-tabulation analysis was employed to determine an overall change in perception (or knowledge of the definition) of IPC from pre-intervention (n=19, 50%, Table 8) to post-intervention (n=20, 60%).

Table 8
Perceptions Results Summary

<table>
<thead>
<tr>
<th>Level of IPC and Correct vs. Incorrect Perceptions (or Knowledge of the Definition) of IPC</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Post-Intervention</th>
<th>Incorrect Perception</th>
<th>Correct Perception</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>5</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>% within Correct vs Incorrect Perception Pre-Intervention</td>
<td>50.0%</td>
<td>30.0%</td>
<td>40.0%</td>
</tr>
</tbody>
</table>

| Correct Perception | Count | 5 | 7 | 12 |
|---|---|---|---|
| % within Correct vs Incorrect Perception Pre-Intervention | 50.0% | 70.0% | 60.0% |

<table>
<thead>
<tr>
<th>Total</th>
<th>Count</th>
<th>10</th>
<th>10</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>% within Correct vs Incorrect Perception Pre-Intervention</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td></td>
</tr>
</tbody>
</table>

Level of IPC and Correct vs. Incorrect Perceptions (or Knowledge of the Definition) of IPC

The final aim of the project was to compare the level of IPC with the correct vs. incorrect perceptions (or knowledge of the definition) of IPC at baseline. Three IPC level subscales, partnership; coordination; and cooperation, and overall score was cross-tabulated and compared with respondent baseline IPC perceptions (or knowledge of definition). A summary table was created to summarize these results (Table 9). Respondents whose perception (or knowledge of
the definition) of IPC was incorrect at baseline reported a ‘partnership’ subscale median score of 33.0 ($\bar{x}$ 33.5, SD 3.78), while those who chose the definition of perception (or knowledge of the definition) of IPC most consistent with that of the IPEC reported a lower median subscale score of 30.0 ($\bar{x}$ 29.22, SD 8.84). The subscales of ‘cooperation’ and ‘coordination’ revealed similar findings. Respondent level of IPC median values of 34.5 ($\bar{x}$ 34.9, SD 3.28) and 27.0 (28.10, SD 4.58) were reported respectively with corresponding incorrect perception (or knowledge of the definition) of IPC at baseline. Correct perceptions (or knowledge of the definition) of IPC corresponded with a median score of 32.0 ($\bar{x}$ 30.2, SD 9.05) for the subscale of ‘cooperation’. The ‘coordination’ subscale reported a median score of 25.0 ($\bar{x}$ 23.3, SD 6.48). The overall level of IPC for those choosing an incorrect definition of perception (or knowledge of the definition) of IPC reported a median score of 96.0 ($\bar{x}$ 96.5, SD 8.25). The overall level of IPC for correct perception (or knowledge of the definition) of IPC reported a median score of 87.0 ($\bar{x}$ 82.2, SD 24.32).

Table 9

IPC Level Subscales/Total and IPC Correct vs. Incorrect Perception

<table>
<thead>
<tr>
<th></th>
<th>Correct vs Incorrect Perception Pre-Intervention</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partnership_Total</td>
<td>Incorrect Perception</td>
<td>10</td>
<td>33.5000</td>
<td>3.77859</td>
<td>1.19490</td>
</tr>
<tr>
<td></td>
<td>Correct Perception</td>
<td>9</td>
<td>29.2222</td>
<td>8.84276</td>
<td>2.94759</td>
</tr>
<tr>
<td>Cooperation_Total</td>
<td>Incorrect Perception</td>
<td>10</td>
<td>34.9000</td>
<td>3.28126</td>
<td>1.03763</td>
</tr>
<tr>
<td></td>
<td>Correct Perception</td>
<td>9</td>
<td>30.2222</td>
<td>9.05232</td>
<td>3.01744</td>
</tr>
<tr>
<td>Coordination_Total</td>
<td>Incorrect Perception</td>
<td>10</td>
<td>28.1000</td>
<td>4.58136</td>
<td>1.44875</td>
</tr>
<tr>
<td></td>
<td>Correct Perception</td>
<td>10</td>
<td>23.3000</td>
<td>6.48160</td>
<td>2.04966</td>
</tr>
<tr>
<td>IPC_Total</td>
<td>Incorrect Perception</td>
<td>10</td>
<td>96.5000</td>
<td>8.24958</td>
<td>2.60875</td>
</tr>
<tr>
<td></td>
<td>Correct Perception</td>
<td>9</td>
<td>82.2222</td>
<td>24.32477</td>
<td>8.10826</td>
</tr>
</tbody>
</table>
**Discussion**

This quality improvement project sought to explore the current condition of authentic IPC in the clinical practice setting through the inquiry into the current respondent-level of IPC, the respondent’s perception (or knowledge of the definition) of IPC, and comparison of the level of IPC with correct (versus incorrect) perception (or knowledge of the definition) of IPC. In addition, this project aimed to determine if an educational intervention would result in a change in the perception (or knowledge of the definition) of IPC. The findings of this project suggested that, in this small sample, the perception of IPC and level of IPC in the clinical setting may not be congruent, consistent with the literature (Alcusky, et al., 2016; Matziou, et al., 2014; Sollami, et al., 2015; Szafran, et al., 2018). The findings also suggested that education on the topic may be beneficial.

In total, eighty-one discrete survey invitations were sent via Qualtrics between October and December 2020. Of these email invitations, twenty-three started the survey, twenty provided demographic information, and respondent survey-completion rates varied between nineteen and twenty for an overall response rate of 23.5%. The majority of respondents were physicians (45%), followed by PAs (30%) and NPs (25%) respectively. Respondents were equally represented with respect to gender (50% female, 50% male) and highest level of education completed (50% Master’s degree, 50% Doctoral degree). The median age of participants was 49.5 years. The median participant years-in-practice was 10 years, with a broad range in respondents time in current role spanning 3 months to 33 years.

Respondent perceptions (or knowledge of the definition) of IPC was surveyed at baseline, and again immediately following the educational intervention. Respondents were asked to choose one of four statements most representative of their perception of IPC. The third statement on the
survey reflected the IPEC definition of IPC. The remaining three options were similar-type statements; however, they more so represented the concepts of group (versus team), cooperation (versus collaboration), and traditional care models. These same concepts then served as the foundation for the brief educational intervention. Respondent perceptions (or knowledge of the definition) of IPC was favorable at the outset, with 50% of the respondents choosing the IPEC definition prior to viewing the educational intervention. After viewing the educational intervention, IPC perception (or knowledge of the definition) did show a modest increase (10%). Seven individuals participated in the six-week follow-up on-question survey. Four (51.14%) of the respondents chose the correct definition.

The respondents’ level of IPC was evaluated with the use of the AITCS-II. This instrument was developed specifically to measure the level of interprofessional collaboration among team members, based on the Canadian Interprofessional Collaborative (CIHC), well-aligned with IPEC’s Core Competencies (Orchard, 2015). Three subscales, including partnership, cooperation, and coordination were analyzed and scored into the following groupings: ‘good collaboration’ (≥ 4.0); ‘moving towards collaboration’ (3.0-3.9); and ‘suggested need to focus on developing collaborative practice’ (1.0-2.9) (Orchard, 2015).

The subscale group pertaining to partnership suggested movement towards collaboration (3.93) among respondents within their workplace environments. Notable areas of good collaboration within the subscale related to inclusion of the patient in goal-setting (4.35), listening to the wishes of the patient when determining the process of care (4.26), working with the patient/family in adjusting care plans (4.11), and encouraging each other, patients and families to use individual knowledge and skills in developing plans of care (4.05).
The subscale category of ‘cooperation’ scores were highest among the subscales, indicative of good collaboration (4.08). The findings did, however, indicate three areas within the category that fell below the threshold of good collaboration. Respondents reported movement towards good collaboration when striving to achieve mutually satisfying resolution to differing of opinions (3.95); sharing of power with each other (3.74); and making changes to team functioning based on reflective reviews (3.68).

The final category focused on coordination. Respondent scores reflected movement towards good collaboration with a subscale category score of 3.67. The topmost area within this subscale corresponded to support for varying of the team leader depending on the needs of the patient (4.25). The lowest score within this scale, however, pertained to the mutual agreement on the selection of the team leader (2.9). These findings suggest a collective agreement for the need to vary leaders; however, there may be divergence in the collective agreement of specifically who the leader should be within respondent workplace teams. Two additional areas of good collaboration within this subscale pointed to encouraging and supporting open communication (including patients/families) during team meetings (4.20) and the use of an agreed upon process to resolve conflicts (4.0).

The overall score for respondents’ level of IPC suggested positive movement towards collaboration (3.90) among respondent workplace teams. The highest overall scores correlated with areas of trust and respect of each another (4.37) and the understanding of shared knowledge and skills between healthcare providers on the team (4.37). The overall low score occurred in the area of mutual agreement on the selection of the leader with the workplace team (2.9).

Data generated from respondents’ perception (or knowledge of the definition) of IPC and respondents’ level of IPC were then used to compare the variables. Perception (or knowledge of
the definition) of IPC was re-assigned as a dichotomous variable (“correct” versus “incorrect”). Each subscale of the level of IPC was compared with correct/incorrect perceptions (or knowledge of the definition) of IPC. The analysis consistently reported lower mean scores in all subscales (partnership, cooperation, and coordination) among those with a “correct” perception (or knowledge of the definition) of IPC. It is posited that respondents with a “correct” perception (or knowledge of the definition) may have had lower mean scores due to a more solid grasp of the authentic meaning/concept and may have therefore been more adept in the identification and measure of the level of IPC taking place within their clinical practice setting.

**Limitations**

There were several limitations to this project. First, the small sample size and convenience snowball sampling technique limits or negates the ability to generalize these findings and exposes these findings to self-selection bias. This project was also hindered by a merger/acquisition of the primary healthcare institution in which the initial sampling frame originated, leading to the subsequent termination of the Regional Director of Operations and project liaison due to organizational shifts. Finally, on March 11, 2020 in a media briefing, the World Health Organization (WHO) Director General reported COVID-19 as a pandemic, the first ever caused by a coronavirus (WHO, 2020). To date, the pandemic continues to exert weighty emotional stressors and other patient care challenges to the US healthcare system, to the economy, families and individuals. The current US death toll has climbed to more than 500,000 individuals. Simultaneously-occurring widespread civil unrest, and a contentious election cycle in the US were also factors that may have contributed to disinterest/distraction, and inability to engage. All of these events are suggested to be heavy contributors to stunted participation.
Suggestions

After extensive review and reflection on this project, it is suggested that ongoing examination on this topic is essential for continued integration of authentic interprofessional models of care. Specifically, large-scale studies are recommended with specific focus on determinants that both encourage and discourage IPC such as demographic influences, interprofessional education (academic programs and workplace continuing education), and organizational factors.

Conclusion

The purpose of this project was to assess participant perception (or knowledge of the definition) of IPC, assess the current level of IPC at baseline, and to determine if an educational intervention would result in a change in the perception. Moreover, the project aimed to assess the current level of IPC and compare the level of IPC with correct (versus incorrect) perception (or knowledge of the definition) of IPC. It has been nearly fifty years since the IOM’s nod towards team-based patient care delivery models, and over ten years since the inception of the IPEC. Are IPC education and healthcare governing/leadership recommendations transcending from academia and committees into clinical practice? These results, albeit small, may signal positive movement toward authentic IPC in the clinical practice environment; however, inference is strongly cautioned based on the aforementioned limitations. It is suggested, too, that ongoing IPC education within the clinical practice setting may further promote and sustain IPC. Authentic IPC may engender a practice environment in which greater professional satisfaction and maximization of professional skills and expertise across disciplines are more readily available, utilized, and synergized in the provision of high-quality patient care and improved patient outcomes.
**References**


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Appendix A

Introduction/Invitation Email

Hello!

My name is Gail Adkins. I am a Doctor of Nursing Practice (DNP) graduate student at Florida State University. I have developed a DNP project that aims to examine the perception and current level of interprofessional collaborative practice among physicians, nurse practitioners, and physician assistants. I am inviting you to participate in this project by completing the attached survey and viewing a brief information component.

Participation will require approximately 10 minutes to complete. Participation is entirely voluntary, and you may withdraw from this study at any time you wish. There is no known risk, nor is there compensation for responding. However, participants who complete the survey project, including a one-month post-participation follow-up question, will be entered to win a $100 Amazon gift card as a thank-you:

Should you choose to participate in this project, please answer the survey questions as honestly and completely as possible. In order to ensure that all information will remain confidential, please do not include your name or any personal identification information. Approximately one month after the initial survey completion, you will receive an email invitation to participate in answering one follow-up question related to the project topic.

Thank-you so much for taking time to assist me. The collected data will provide useful information regarding ways in which interprofessional practice among physicians, nurse
practitioners, and physician assistants may be enhanced and/or improved. Please feel free to forward this email to physician, physician assistants, and nurse practitioner colleagues who may also be interested in survey participation.

If you have any questions or concerns about this research study, please contact me, Gail Adkins, the principal investigator, at gla18c@my.fsu.edu. You may also contact my major professor and Assistant Dean for Graduate Programs, Dr. Susan Porterfield, at the Nursing Office at FSU at sporterfield@nursing.fsu.edu.

Kindest Regards,

Gail L. Adkins, RN, BSN, DNP Student, Florida State University
Principal Investigator
Appendix B

IPC Perceptions Survey

Please choose the statement that best represents your perception of interprofessional collaborative practice:

1. Interprofessional collaborative practice occurs when two or more healthcare team members from different professional disciplines work to achieve each other’s individual goals in the pursuit of a common healthcare goal.

2. Interprofessional collaborative practice: when the healthcare team leader thoughtfully considers the opinion of other healthcare team members from different professional disciplines before making a final decision in the plan of care.

3. Interprofessional collaborative practice: when two or more healthcare team members from different professional disciplines work together to achieve a shared goal.

4. Interprofessional collaborative practice: when different professional disciplines recognize themselves as distinct from one another and work independently to achieve the healthcare institution’s organizational goals.
Appendix C

Follow-Up Invitation Email

Hello!

Welcome back and thank-you for your participation in the final portion of the Interprofessional Collaborative Practice doctoral project. Following your participation in all portions of the project, you will be entered into a drawing for a $100 Amazon gift card as a token of thanks.

The estimated time to complete the final step of the project is 1 minute or less. Take care and have a wonderful rest of your day!

Kindest Regards,

Gail Adkins, RN, BSN, DNP Student, Florida State University
Appendix D

Assessment of Interprofessional Team Collaboration Scale II (AITCS-II)

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The AITCS is a diagnostic instrument that is designed to measure the interprofessional collaboration among team members. It consists of 23 statements considered characteristic of interprofessional collaboration (how team works and acts). Scale items represent three elements that are considered to be key to collaborative practice. These subscales are: (1) Partnership—8 items, (2) Cooperation—8 items, and (3) Coordination—7 items.

Scoring AITCS

Respondents indicate their general level of agreement with items on a 5-point rating scale that ranges from 1 = “Never”; 2 = “Rarely”; 3 = “Occasionally”; 4 = “Most of the time”; to 5 = “Always”.

These ratings produce scores from 23 to 115. It takes approximately 10 minutes to complete.

Demographic Information

Please enter the last four digits of your employee ID number in these boxes: □□□□

Please check □ the category you belong to:

Gender: □ Male □ Female Age: _____ years

Employment Status: □ FT □ PT □ Casual

Educational Preparation

□ Certificate □ bachelor’s degree

□ Diploma □ Master’s Degree

□ Other (specify): __________
Please check one of the following discipline categories:

☐ Audiologist
☐ Clinical Kinesiologist
☐ Clinical Psychologist
☐ Dental Assistant
☐ Dentist
☐ Dietary Aid
☐ Dietitian (Nutritionist)
☐ Imaging Technologist
☐ Laboratory Technologist
☐ Nursing: Registered Nurse
☐ Nursing: Practical Nurse
☐ Occupational Therapist
☐ Other (please specify) __________

☐ Physical Therapist (Physiotherapist)
☐ Pharmacy
☐ Paramedics
☐ Physician (Medicine)
☐ Personal Support Worker
☐ Speech Language Pathologist
☐ Social Worker
☐ Spiritual/Pastoral Care
☐ Recreational Therapist
☐ Respiratory Therapist
☐ Therapy Assistant

Please indicate:

Years in practice (since achieving license to practice):__________; Years with your current team:__________

Assessment of Interprofessional Team Collaboration Scale

Instructions:

Note: Several terms are used for the person who is the recipient of health and social services.

For the purpose of this assessment, the term ‘patient’ will be used. While acknowledging other terms such as ‘client’ ‘consumer’ and ‘service user’ are preferred in some disciplines/jurisdictions.

Please circle the value which best reflects how you currently feel your team and you, as a member of the team, work or act within the team.
Section 1: PARTNERSHIP

When we are working as a team all of my team members...

| 1 | include patients in setting goals for their care | 1 | 2 | 3 | 4 | 5 |
| 2 | listen to the wishes of their patients when determining the process of care chosen by the team | 1 | 2 | 3 | 4 | 5 |
| 3. | meet and discuss patient care on a regular basis | 1 | 2 | 3 | 4 | 5 |
| 4. | coordinate health and social services (e.g. financial, occupation, housing, connections with community, spiritual) based upon patient care needs | 1 | 2 | 3 | 4 | 5 |
| 5. | Use consistent communication with to discuss patient care | 1 | 2 | 3 | 4 | 5 |
| 6. | Are involved in goal setting for each patient | 1 | 2 | 3 | 4 | 5 |

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1 A team can be defined as any interactions between one or more health professionals on a regular basis for the purposes of providing patient care.
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<tbody>
<tr>
<td>7.</td>
<td>encourage each other and patients and their families to use the knowledge and skills that each of us can bring in developing plans of care</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8.</td>
<td>work with the patient and his/her relatives in adjusting care plans</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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**Section 2: COOPERATION**

When we are working as a team all of my team members…

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<tbody>
<tr>
<td>9.</td>
<td>share power with each other</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10.</td>
<td>respect and trust each other</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11.</td>
<td>are open and honest with each other</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12.</td>
<td>make changes to their team functioning based on reflective reviews</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>13.</td>
<td>strive to achieve mutually satisfying resolution for differences of opinions</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14.</td>
<td>understand the boundaries of what each other can do</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>15.</td>
<td>understand that there are shared knowledge and skills between health providers on the team</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
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</table>
16. establish a sense of trust among the team members

| 1 | 2 | 3 | 4 | 5 |

**Section 3: COORDINATION**

When we are working as a **team** all of my team members…

<table>
<thead>
<tr>
<th>16.</th>
<th>apply a unique definition of <em>Interprofessional collaborative practice</em> to the practice setting</th>
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<tbody>
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<td>1</td>
<td>2</td>
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<thead>
<tr>
<th>17.</th>
<th>equally divide agreed upon goals amongst the team</th>
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<tr>
<td>1</td>
<td>2</td>
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<tr>
<th>18.</th>
<th>encourage and support open communication, including the patients and their relatives during team meetings</th>
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<td>1</td>
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<th>19.</th>
<th>use an agreed upon process to resolve conflicts</th>
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<th>20.</th>
<th>support the leader for the team varying depending on the needs of our patients</th>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
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<tr>
<th>21.</th>
<th>together select the leader for our team</th>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
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<tr>
<th>22.</th>
<th>openly support inclusion of the patient in our team meetings</th>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
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</table>

**Revised version November 16, 2015**

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Appendix E

June 15, 2020

Gail Adkins 615-585-8474 gla18c@my.fsu.edu

FLORIDA STATE UNIVERSITY OFFICE of the VICE PRESIDENT for RESEARCH

NOT HUMAN RESEARCH

Dear Gail Adkins:

On 6/15/2020, the IRB staff reviewed the following submission:

<table>
<thead>
<tr>
<th>Title of Study:</th>
<th>Interprofessional Collaboration: Perceptions and Practice in Healthcare Providers</th>
</tr>
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<tbody>
<tr>
<td>Investigator:</td>
<td>Gail Adkins</td>
</tr>
<tr>
<td>Submission ID:</td>
<td>STUDY00001457</td>
</tr>
<tr>
<td>Study ID:</td>
<td>STUDY00001457</td>
</tr>
<tr>
<td>Funding:</td>
<td>None</td>
</tr>
</tbody>
</table>
IND, IDE, or HDE: None

Documents Reviewed:
- Orchard AITCS II 2015 (5) (2).pdf, Category: Survey/Questionnaire;

The IRB staff determined that the proposed activity is not research involving human subjects as defined by DHHS and/or FDA regulations.

IRB review and approval by this organization is not required. This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these activities are research involving human subjects in which the organization is engaged, please submit a new request to the IRB for a determination. You can create a modification by clicking Create Modification / CR within the study.

Sincerely,

Human Subjects Research Office humansubjects@fsu.edu