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IMPACT OF EMOTIONAL INTELLIGENCE ON INTERPROFESSIONAL TEAMWORK, INTERPROFESSIONAL COMMUNICATION, AND INTERPROFESSIONAL LEADERSHIP

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IMPACT OF EMOTIONAL INTELLIGENCE ON INTERPROFESSIONAL TEAMWORK, INTERPROFESSIONAL COMMUNICATION, AND INTERPROFESSIONAL LEADERSHIP

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Table of Contents

List of Tables

List of Figures

Abstract

Objective: The purpose of this body of work was to explore relationships among emotional intelligence (EI) and interprofessional (IP) competency domains to enhance IP team dynamics and communication.

Background: Decentralization of healthcare delivery may hinder effective handoffs creating opportunity for miscommunication of vital information and subsequent medical errors. Fostering effective communication is paramount for IP teams; however, differing communication styles can promote misunderstanding and conflict. Behavioral aspects of team dynamics and communication that comprise EI may be a solution but are rarely addressed in educational and safety programs.

Methods: Included in this portfolio are three manuscripts that help elucidate the relationships among EI and IP competencies. Chapter 2 begins with a cross-walked matrix of EI and Advanced Practice Registered Nurses (APRN) professional competencies. Chapter 3 introduces a framework for connecting EI and IP competencies through the "Meshing Emotional Intelligence Determinants and Interprofessional Collaborative Competencies" (MEDICC) model. Chapter 4 explains the two-phased study exploring the relationships among EI competencies and IP communication, teamwork and leadership competencies.

Results: Although most findings did not reach significance, likely due to small sample size, it is notable that SA, SM, and SOA together explained 73% of the variance in RM. Also, collectively EI domains accounted for over 40% of the variance in each IP competency. Finally, IPC and IPT explained 73% of the variance in IPL.

Conclusion: This portfolio supports further consideration of including EI in IP team education and subsequent safety programming to enhance work environment as well as in future research.

Chapter 1: Overview of the Dissertation Research Focus

Patient safety is a priority for healthcare institutions and consumers. Patient safety campaigns are a national focus (Frankel, Haraden, Federico, & Lenoci-Edwards, 2017; The Joint Commission [TJC], 2021; National Patient Safety Foundation [NPSF], 2015). These national efforts are evidenced in local healthcare facilities; however, the decentralization and fragmentation of care resulting from growth and complexity of care within modern work environments has promoted challenges with communication (Johnson, 2019). Frequent handoffs and miscommunication can occur, which can contribute to medical errors (Clapper & Ching, 2018; Kohn, Corrigan, & Donaldson, 1999; Ouslander, Bonner, Herndon, & Schutes, 2014; Romano, Segal, & Pollack, 2015). Healthcare educators and administrators have implemented a variety of patient safety strategies in response to these challenges (Gandhi, Berwick, & Shojana, 2016; NPSF, 2015; TJC, 2021); however, errors continue to be made (Gandhi et al., 2016). Given that healthcare is delivered by the interprofessional team (IPT), communication among the team is central to error reduction and success with patient care (Bekkink, Farrell, & Tsakayesu, 2018; Lee & Doran, 2017). Different communication styles among various healthcare disciplines can result in miscommunication and interprofessional (IP) conflict (Almost, Wolff, Stewart-Pyne, McCormick, Strachan, & D'Souza, 2016; Fox, Gadboury, Chiocchio, & Vachon, 2021). Furthermore, IP healthcare teams frequently are organized in a hierarchy of professions that may inhibit collegiality and collaboration, exacerbating communication challenges.

Communication is associated with interpersonal relationships, which are dependent on "soft skills" that are infrequently studied in healthcare (Foronda, MacWilliams, & McArthur, 2016). Emotional intelligence (EI) captures some of these soft skills and has been identified as fundamental to interpersonal relationships (Boyatzis, 2018). There are four domains within EI, a

person's self-awareness (SA), self-management (SM), and social awareness (SOA) and relationship management (RM). These contribute to one's ability to use emotions in self and others (Mayer, Salovey, Caruso, & Sitarenios, 2003). Connecting EI with IP competencies may offer insight into how to reduce errors promoted by communication challenges.

Making connections among the professional competencies expected of graduates of any healthcare professions program and behaviors expected of IP teams may enhance effective communication. Chapter 2 begins with providing a proposed matrix of EI and Advanced Practice Registered Nurse (APRN) competencies (Cox, 2018) that explains how APRN graduates are already expected to incorporate EI in their communication with the IP team; however, other IP team members may not have had the same expectations within their educational preparation. This article was published in the Journal of Nursing Education for the purpose of helping reiterate the importance of EI in APRN education.

Because interpersonal skills are rarely addressed during educational and safety programs designed to reduce adverse events (Almost, Wolff, Stewart-Pyne, McCormick, Strachan, & D'Souza, 2016; Johnson, 2019), a framework was offered to conceptualize the relationships among EI domain competencies and IP competencies in Chapter 3. Three IP competencies were chosen for initial study, IP teamwork, communication, and leadership. These competencies were developed and verified by the Interprofessional Education Collaborative (IPEC, 2016). The framework was entitled the Meshing Emotional intelligence Determinants and Interprofessional Collaboration Competencies (MEDICC) to help remind clinicians and educators that both EI and IP competencies are essential to collaboration. The MEDICC model is explained in a manuscript submitted to the *Journal of Interprofessional Education & Practice* in October 2021.

The cross-sectional, exploratory, predictive study explained in Chapter 4 included both medical and APRN students from multiple universities help with establishing a preliminary understanding of relationships among SA, SM, SOA, RM, IPC, IPT, and IPL as proposed within the Meshing Emotional intelligence Determinants and Interprofessional Collaboration Competencies (MEDICC) model. Since there were only 11 matched cases within the sample, statistical significance was not met, nor expected, in the analysis. However, it was noted that despite the small sample size, SA, SM, and SOA together explained 73% of the variance in RM in the sample. Also, collectively EI domains accounted for over 40% of the variance in each IP competency and IPC and IPT explained 73% of the variance in IPL in the study sample. These findings cannot offer any inference or generalizable support to include EI in IP team education and subsequent work dynamics; however, the findings do support consideration of inclusion and further exploring the interrelationships among EI and IPT, IPC and IPL in future studies.

Chapter 5 discusses how future work can further elucidate the connection among EI and IP competencies. Improving IP education and practice by focusing on important interpersonal skills could improve patient safety and outcomes, which is a universal goal across healthcare disciplines, settings, locations, and providers

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Chapter 2: Using Emotional Intelligence to Enhance Advanced Practice Nursing Competencies

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Abstract

Background: Interpersonal relationships are fundamental to competent delivery of healthcare. Nursing practice is grounded in interpersonal relationships, making Advanced Practice Registered Nurses (APRNs) well prepared to ensure delivery of safe, effective care. Research demonstrates interpersonal dynamics can be enhanced. Emotional intelligence (EI) is the ability to perceive, understand, manage, and use emotions in self and others, and comprises a key factor in interpersonal relationships.

Method: APRN education is grounded in the QSEN and Master's Essentials competencies. This analysis provides a framework to align APRN professional competencies with EI competencies to enhance leadership, communication, and teamwork in healthcare teams.

Results: By using the matrix of EI and APRN competencies provided, nurse educators may implement learning strategies to improve EI and support APRN competencies.

Conclusion: Well-educated and emotionally intelligent APRNs can enhance cooperation in multidisciplinary teams, promote better communication, and demonstrate APRN leadership to improve patient outcomes.

Using Emotional Intelligence to Enhance Advanced Practice Registered Nursing Competencies

In 1999 the Institute of Medicine (IOM) released a report that pinpointed medical error as the cause of 100,000 hospital patient deaths annually (Kohn, Corrigan, & Donaldson, 1999). The report highlighted the decentralization and fragmentation of care in an increasingly complex healthcare delivery system as an important component of medical error (Kohn et al., 1999; Ouslander, Bonner, Herndon, & Schutes, 2014; Romano, Segal, & Pollack, 2015). Over the last 20 years, complexity of healthcare delivery has continued to increase (Romano, Segal, & Pollack, 2015). Despite countless quality and safety initiatives, preventable patient harm remains a major issue (National Patient Safety Foundation [NPSF], 2015).

Healthcare educators in all disciplines, including Advanced Practice Registered Nurse (APRN) educators, have integrated quality and safety education into foundational professional competencies to immerse students in safe practice from the beginning of their professional career (American Association of Colleges of Nursing [AACN], 2011; AACN 2012; Stoller, Taylor, & Farmer, 2013; Nasca, Weiss, & Bagian, 2014). Despite much attention focused on patient quality and safety since the 1999 IOM report was published, there has been little sustained improvement (Federico, 2015). Exposing students in healthcare disciplines to the importance of quality and safety early on in professional education seems to have not had the impact on patient harm that was expected. Perhaps awareness of the issue and education about how to resolve it are not sufficient.

One factor has remained constant over the last 20 years: the decentralization and fragmentation of care in a complex healthcare delivery system. This decentralization and care fragmentation are not solely related to care delivery itself; rather, also to the complex network of

interpersonal relationships within which care is delivered. The practice of nursing on all levels is grounded in interpersonal relationships, including APRN education (D'Antonio, Beeber, Sills, & Naegle, 2014). APRNs are positioned on interprofessional teams such that they can interact across the healthcare system, bridging potential interpersonal communication gaps and facilitating relationships (Weller, Boyd, & Cumin, 2014). Delivery of safe, quality care, in many ways, relies on APRNs' demonstration of leadership, communication, and teamwork (AACN, 2011; AACN, 2012; Barnsteiner, Disch, Johnson, McGuinn, Chappell, & Swartwout, 2013).

Emotional intelligence (EI), described as the ability to perceive, understand, manage, and use emotions in self and others, comprises a key factor in interpersonal relationships that are inherent in actualizing leadership, communication and teamwork in healthcare (Fernández-Berrocal, Extremera, Lopes, & Ruiz-Aranda, 2014). Fundamentally, the science of nursing is inextricably bound to the transformative power of interpersonal relationships (D'Antonio et al., 2014). Although healthcare delivery remains dependent on interpersonal relationships, the various healthcare disciplines have not yet fully embraced integrating EI into health professions' education (Flowers, Thomas-Squance, Braini-Rodriguez, & Yancy, 2014). This article outlines specific EI competencies and explores how EI competencies support and align with APRN educational competencies. Nurse educators may then use strategies such as reflective journaling to enhance EI in support of APRN competencies.

Emotional Intelligence Competencies

After decades of research on non-cognitive intelligence, Salovey and Mayer created the term "emotional intelligence" in 1990 to describe people who possess self- and social awareness and use this ability in decision-making (Cherniss, 2010). Goleman's book *Emotional Intelligence* in 1995 proposed EI to leaders in business, social sciences, and educators as a way

to quantify individual intangibles outside of the classic measures of intelligence such as the Intelligence Quotient (IQ) that lead to success (Cotler, DeTursi, Goldstein, Yates, DelBelso, & College, 2017; Grant, 2013; Johnson & Blanchard, 2016; Lanciano & Curci, 2014; Terziyan & Kaikova, 2015). Early on, a philosophical debate divided experts on whether EI is an ability (skill or proficiency) or a trait (inherent quality); many, however, proposed that EI is comprised of both (Ackley, 2016). For purposes of this discussion, EI is considered an inherent quality that can be both measured like an ability and enhanced by incorporating particular strategies, either individually or within an education setting such as APRN curricula.

EI consists of four dimensions: 1) *self-awareness*, which is the ability to identify one's emotions; 2) *self-management*, described as the ability to use one's emotions for reasoning and problem-solving; 3) *social awareness*, which is the ability to understand others' emotions; and 4) *relationship management*, the ability to effectively manage emotions in self and others for the purpose of what could be called teamwork (Codier & Codier, 2017). Each dimension's competencies are listed in Table A1. These dimensions are divided into personal competence, which consists of skills related to *self-awareness* and *self-management* and social competence, which involves *social awareness* and *relationship management* skills (Table A1) (Stoller, Taylor, & Farver, 2013). Self-awareness and self-management skills are typically well formed prior to mastery of the social competence elements because accurate self-assessment is foundational to expression of social competence (Goleman, 2005). Accurate self-assessment supports critical thinking and clinical judgment, which are expected hallmarks of APRN professional practice (Niu, Behar-Horenstein, & Garvan, 2013).

In addition to supporting the personal competencies' attributes of self-assessment and self-management, research supports associations between EI and characteristics of leadership,

communication, and teamwork in business settings (Terziyan & Kaikova, 2015; Maqbool, Sudong, Manzoor, & Rashid, 2017). EI's success in business has caught the attention of healthcare disciplines such as medicine, pharmacy, and behavioral health, which are incorporating EI competencies into professional education (Bowe & Jones, 2017; Flowers et al., 2014; Haight, Kolar, Nelson, Fierke, Sucher, & Janke, 2017; Heckemann, Schols, & Halfens, 2015; Johnson & Blanchard, 2016; Schutte, Palanisamy, & McFarlane, 2016). APRN leadership, communication, and teamwork competencies use the EI social competencies within *social awareness* and *relationship management* (Table A2) (Mikolajczak & Bellegem, 2017; Lanciano & Curci, 2015; Almost, Wolff, Stewart-Pyne, McCormick, Strachan, & D'Souza, 2016). Faculty developing APRN curricula seek to incorporate the professional competencies of the Graduate Quality and Safety Education for Nurses (QSEN) core competencies (AACN, 2012) and the Essentials of Master's Education in Nursing (AACN, 2011) to meet regulatory guidelines, as outlined in Table A2. Aligning EI competencies with foundational APRN competencies has the potential to further strengthen APRNs' leadership, communication, and teamwork skills. By aligning EI competencies with APRN competencies as demonstrated in the matrix provided in Table A3, APRN educators have a roadmap to use the significant body of EI research for application in APRN education.

APRN & EI Competencies

The APRN Essentials of Master's Education in Nursing (AACN, 2011) competencies were updated, and QSEN competencies (AACN, 2012) were integrated into APRN curricula in response to the 2010 Institute of Medicine's (IOM) consensus report on the Future of Nursing (Barnsteiner et al., 2013). EI-related competencies are applicable across the gamut of QSEN Competencies and Master's Essentials. The QSEN competencies specifically detail the requisite

nursing Knowledge, Skills, and Attitudes (KSA) necessary for each competency (Barnsteiner et al., 2013; Gerard, Kazer, Babington, & Quell, 2014). The classic nursing KSA of APRN Essentials' competencies mimics Boyatzis' description of EI competencies, requiring knowledge, action, and intent (Boyatzis, 2009). Examples of how QSEN Competencies and Master's Essentials competencies intersect with EI Competencies are provided in the matrix in Table A3. Advanced critical thinking and clinical judgment, the foundation of competent APRN practice, differentiates APRN practice from other levels of nursing practice (Hamric, Hanson, Tracy, & O'Grady, 2015). Nursing as a profession has always been grounded in critical thinking and application of clinical judgment; advanced nursing practice requires even higher levels of knowledge, action, and intent to support the requisite leadership, communication, and teamwork competencies outlined in APRN education competencies. By cross-walking APRN competencies with EI competencies as suggested in the matrix provided, APRN educators can more easily incorporate these competencies. Additionally, by framing EI as a set of traits and abilities, EI can be measured and studied empirically. Using ability-based EI instruments such as the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) allows educators and researchers to measure interventions designed to enhance EI (Brackett & Salovey, 2006).

Many instruments used to measure EI are self-reported or self-assessed measures (Snowden, Watson, Stenhouse, & Hale, 2015). Though experts differ philosophically on whether EI is an ability or a trait (Ackley, 2016), the two original researchers, Salovey and Mayer have always characterized EI as an ability (Brackett & Salovey, 2006). The MSCEIT is an online 141 item instrument that measures four branches, outlined as the ability to perceive emotion, use emotion to facilitate thought, understand emotions, and to manage emotions (Mayer & Salovey,1997). This test is divided among 8 types of tasks representing two for each branch

and takes approximately 30-40 minutes to complete. The results include 7 scores: one for each branch, two area scores, and a total EI score that measure a participant's skill in each of the four branches. Considering EI an ability allows measurement of an intervention's impact on EI. Therefore, the ability-oriented instrument MSCEIT is recommended to measure APRN students' EI (Brackett & Salovey, 2006).

Leadership Competencies

APRN competencies such as QSEN Patient Centered Care and Master's Essential VI Health Policy and Advocacy (AACN, 2012) align with leadership ability. The EI competency e*mpathy* is a competency of EI social awareness and is a quality necessary to provide QSEN competency Patient Centered Care and Master's Essential VI Health Policy and Advocacy (AACN, 2012). Patient advocacy has been a fundamental tenet of nursing practice since time immemorial. APRNs demonstrate leadership in patient centered care by actively advocating for and promoting organizational policies that enhance patient empowerment. To empower others, APRNs must first demonstrate cognitive empathy (ability to understand another's perspective) and empathic concern (ability to sense what others need) (Goleman, Boyatzis, & McKee, 2013). These EI competencies, mastered during APRN education, should enhance leadership skills in practice. *Organizational awareness*, a competency of EI social awareness, and *influence* and *change catalyst*, EI competencies of relationship management are detailed in Master's Essential II, Organizational and Systems Leadership (AACN, 2011). To be organizationally effective, the APRN must demonstrate *influence* and *inspirational leadership*, elements of EI social competency *relationship management*. This position is well documented in business literature ((Maqbool, et al, 2017). Inspirational leaders are also creative and can be powerful *change catalysts* as changes are inevitable in organizations committed to continuous quality

improvement. If EI social awareness competencies of *empathy*, and *organizational awareness*, and EI relationship management competencies of *influence*, *inspirational leadership,* and *change catalyst* are enhanced during APRN education, demonstration of commensurate APRN educational competencies may be enhanced.

Communication Competencies

In 2016, the Joint Commission determined that the root cause of most sentinel events continues to be miscommunication (Joint Commission, 2016). Miscommunication can stem from patients having a "primary team" of internal medicine providers and also having consultants in cardiology, pulmonology, or infectious disease, for example. In addition to specialty disciplines, the complexity of the healthcare team creates opportunities for miscommunication, across the roles and responsibilities of MDs, APRNs, Physician Assistants, Pharmacists, Registered Nurses (RNs), lab techs, sonographers, radiology techs, and various other ancillary personnel. Healthcare delivery within these roles involves a series of information handoffs on multiple levels, resulting in further opportunities for communication failures. Studies have shown that higher EI is directly associated with greater communication skill (Lee & Gu, 2013; Cherry, Fletcher, & O'Sullivan, 2014). This association supports Master's Essentials III and VI that specifically elucidate APRNs' responsibility to communicate, collaborate, and consult with other healthcare professionals (AACN, 2011). These competencies also support the QSEN competencies of Quality Improvement and Safety (AACN, 2012). APRNs who have the EI social competency skills in *social awareness: empathy* and *relationship management: building bonds, conflict management* further actualize the competencies that demonstrate a positive impact on communication within the healthcare team.

In many current healthcare models, especially acute care, fragmentation of care increases due to the number of providers interacting on all levels as described previously (Ouslander et al., 2014). APRNs are best suited to connect across the roles within the healthcare team and to interact with various interprofessional providers and capitalize on interpersonal relationships. The APRN has the responsibility to be the communication hub on multidisciplinary teams, effectively communicating information to and from the patient, the nursing staff, ancillary providers, and physician staff. The EI self-management competencies of *transparency* fosters trust and honest communication, serving to increase the relationship management competency of *influence,* and thereby reduce fragmentation of care with better communication.

Teamwork Competencies

Leadership and patient-engaged teamwork among the various disciplines are key factors in establishing a culture of safety within healthcare facilities. Nursing executives, hospital administrators, and physician colleagues must partner with APRNs to establish a functional culture of safety within their healthcare organizations (Chassin & Loeb, 2013). Accurate information sharing comprises one component of safe care delivery; how information is shared is another. QSEN competency Teamwork and Collaboration describes the APRN role as one that fosters open and honest communication, mutual respect, and shared decision-making (AACN, 2012), all qualities actualized within EI self-management competencies of *transparency,* and *adaptability*, and relationship management competency *developing others,* and *building bonds*. Master's Essential II states that APRNs must also understand that "promotion of high quality and safe patient care" is key to good working relationships amongst interdisciplinary teams (AACN, 2011, p. 4), actualized within EI relationship management competencies *building bonds, conflict management,* and *teamwork & collaboration.*

Patient safety initiatives focus on pre-emptive harm prevention strategies instead of individual error review (Gandhi, Berwick, & Shojana, 2016). An APRN leader who has mastered the EI relationship management competency *change catalyst* will have the skills to guide multidisciplinary teams toward these organizational goals. APRNs must be able to "communicate, collaborate, and consult" with other team members to promote safe quality care according to Master's Essential VII Interprofessional Collaboration (AACN, 2011, p. 5). The QSEN Competency Teamwork and Collaboration and Master's Essential VII are actualized within the EI relationship management competencies of *teamwork & collaboration*, *building bonds*, and *conflict management*. Studies investigating EI in business identified EI relationship management competencies as essential to high-functioning teams (Maqbool et al., 2013). A study on disaster-management teams use of EI recognized the specific relationship management competencies of *teamwork & collaboration* and *building bonds* and the EI self-management competency *adaptability* as key to successful disaster drills (Wilkinson, 2015). Educators in all healthcare disciplines, not just APRN educators, have the opportunity to integrate EI into their curricula to expose future team members to the fundamentals of safe, quality practice and teamwork (Carney et al., 2017-Med Ed; Sherwood & Zomorodi, 2014; Boland, Scott, Kim, White, & Adams, 2016).

Enhancing EI to Improve APRN Competencies

This review has already linked EI to APRN competencies. Thus, enhancing EI will enhance APRN competencies. While a detailed exploration of strategies to enhance EI in nursing curricula is beyond the scope of this review, a brief discussion of potential methods to incorporate EI into reflective learning is warranted. Clinical experiences are the foundation of APRN curricula, and reflective learning is a strategy frequently used to translate these

experiences into empirical understanding. Reflective learning supports advanced critical thinking and clinical judgment (Bussard, 2015; Garrity, 2013; Ruiz-López et al., 2015; Silvia, Valerio, & Lorenza, 2013). Reflection, according to Mezirow's Transformative Learning theory (Kitchenham, 2008), allows the student to find meaning in experience. Journaling provides an avenue to revisit an experience, to reflect and reframe the experience in context of new knowledge (Harrison & Fopma-Loy, 2010; Reed 2015; Silvia et al., 2013). Strategies such as reflective journaling, online clinical conferencing, or blogging can be used to assist with APRN students' processing of clinical experiences (Berkstresser, 2016; Garrity, 2013; Gordon, 2017; Harrison & Fopma-Loy, 2010; Montenery, Walker, Sorensen, Thompson, Kirklin, White, & Ross, 2013; Naber & Wyatt, 2014; Raterink, 2016; Reed & Edmunds, 2015; Ruiz-López et al., 2015). Reflective journaling is by far the most commonly practiced strategy; however, most research has been undertaken in undergraduate nursing education. Research relating EI competencies to APRN competencies and incorporating EI-based prompts to guide APRN student reflective journaling is an area which merits further study.

Conclusion

Healthcare complexity and fragmentation can be positively affected by highly EI competent APRNs. These leaders are uniquely positioned to connect the complex healthcare team and simplify its inherent intricacies. EI competencies help actualize APRN graduate education competencies as outlined by AACN's QSEN competencies and the Essentials of Master's Education in Nursing. Incorporating content to master EI competencies within APRN curricula could strengthen APRN educational competencies. Integration of EI competencies within the curricula can promote APRN students' professional development, as well as enhance leadership, communication, and teamwork skills necessary to excel in the ever-changing

healthcare delivery landscape. Furthermore, existing instruments, such as the ability-based MSCEIT, provide an evidentiary foundation for assessing the success of teaching EI competencies to APRN students. A well-educated and emotionally intelligent APRN graduate can enhance cooperation in multidisciplinary teams, promote better communication, and demonstrate APRN leadership to improve patient outcomes. APRN educators must be educated on how to employ learning strategies such as reflective journaling, online clinical conferencing, and shared blogs that are designed to enhance EI. These intentional efforts will foster emotionally intelligent APRNs that can impact the future of healthcare.

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Chapter 3: Improving Interprofessional Team Collaboration and Patient Safety: The MEDICC Model

Abstract

Background: Patient safety can be compromised by miscommunication and conflict among interprofessional healthcare team members (IPHTM). Healthcare delivery occurs within a complex network of interpersonal relationships and inputs from multiple IPHTM. Lack of emotional intelligence (EI) can create IPHTM miscommunication and conflict. These interpersonal "soft skills" are rarely addressed in IP education (IPE) and IP practice (IPP) patient safety programs.
Framework: A framework is needed to guide and evaluate the impact of EI on IPHTM competence. A model was proposed that is based on existing EI and IP domain competencies to facilitate the inclusion of essential information in education and patient safety programs for IP team members.
Method: Existing work on EI and IP competence has provided clinicians with guidance for each of these important aspects of health professions work; however, there has been no cogent framework for blending them to guide IPP. The Meshing Emotional intelligence Determinants and Interprofessional Collaborative Competencies (MEDICC) model was derived from competencies developed and verified by research. The MEDICC Model is comprised of the self-awareness (SA), self-management (SM), social awareness (SOA) and relationship management (RM) EI domains that contribute to one's ability to use emotions in self and others. Within the model these EI domains have direct relationships with the essential IP competencies of interprofessional teamwork (IPT), interprofessional communication (IPC), and interprofessional leadership (IPL).
Conclusion: By understanding the impact of EI domains on IP variables, educators and administrators can develop patient safety programs that strengthen IPHTM EI competence, which would be expected to improve IPHT leadership and effectiveness, reduce miscommunication and conflict, and optimize patient outcomes. Researchers using the MEDICC model can identify potential opportunities to build efficiently functioning IPHTs and guide the design of quality IPE.

Improving Interprofessional Team Collaboration and Patient Safety: The MEDICC Model

Healthcare providers strive to provide safe patient care while optimizing outcomes. Healthcare organizations devote significant resources to maintain and improve patient safety. Because healthcare delivery occurs within a complex network of interpersonal relationships and interprofessional healthcare teams (IPHT), delivery of safe patient care is often compromised due to miscommunication, competing approaches to care, and, at times, direct inter- and intra-team conflict (Godse & Thingujam, 2010; Weiszbrod, 2020). Differing communication styles among the various healthcare disciplines have been shown to be a factor in miscommunication and potential team member (IPHTM) conflict (Almost, Wolff, Stewart-Pyne, McCormick, Strachan, & D'Souza, 2016; Fox, Gaboury, Chiocchio, & Vachon, 2021). Since the alarming revelation in 1999 that medical error accounts for significant numbers of preventable deaths, healthcare organizations have implemented a variety of patient safety programs (Kohn, Corrigan, & Donaldson, 1999; Frankel, Haraden, Federico, & Lenoci-Edwards, 2017; The Joint Commission [TJC], 2021; National Patient Safety Foundation [NPSF], 2015). Most safety programs, however, do not address underlying behavioral aspects of IPHTM dynamics that can undermine effective communication and collaboration (Foronda, MacWiliams, & McArthur, 2016; Weiszbrod, 2020). These interpersonal "soft skills" must be addressed initially during IP education (IPE) and subsequently during implementation of patient safety programs to improve IP communication (IPC) and enhance IP practice (IPP) collaboration.

Maximizing IPE and IPP with the MEDICC Model

To design feasible IPE and IPP programs, designers must be able to define relevant IP skills, gain consensus regarding their impact on patient safety, and incorporate them into program planning. The interpersonal skills commonly associated with emotional intelligence

(EI) are gaining recognition as IPP is normalized across the healthcare delivery spectrum (Rosenstein & Stark, 2015). Astute organizational leaders increasingly recognize that active management and maintenance of a positive emotional culture within their organization promotes a culture of safety (Barsade & O'Neill, 2016; National Patient Safety Foundation [NPSF], 2015). A framework that facilitates understanding the connections between EI and IPP can be used to guide development of patient safety interventions that foster IPE and IPP beyond language to actionable metrics for evaluating impact of the IPHT on associated patient outcomes. The Meshing Emotional intelligence Determinants and Interprofessional Collaboration Competencies (MEDICC) model (see Figure A.1) is proposed to encompass behavioral aspects of EI domains that contribute to improved IPP collaborative competencies and team effectiveness. The relationships among the four EI domains and three designated IP competencies within the MEDICC model are intended to inform understanding about how to impact delivery of IPE and patient safety programs. Researchers Mayer, Salovey, and Caruso (2003) first described the foundational EI principles that underpinned the development of the MEDICC model, and the Interprofessional Education Collaborative (IPEC) delineated the three IPP collaboration competencies contained in the MEDICC model that are critical for establishing patient safety and impacting outcome (IPEC, 2016).

Competency in Emotional Intelligence

Emotional intelligence has been described as the ability to perceive, understand, manage, and use emotions in self and others (Mayer, Salovey, Caruso, & Sitarenios, 2003), and has been associated with the ability to monitor, evaluate, and implement more effective communication strategies in healthcare teams (Cherry, Fletcher, & O'Sullivan, 2014; Rosenstein & Stark, 2015). There are four EI domains that are further divided into personal and social competencies. The personal EI competencies encompass internal processes, while the social EI competencies

are outwardly manifested and thus easier to observe. The personal EI competence domains are self-awareness (SA) and self-management (SM). Social EI competencies are social awareness (SOA) and relationship management (RM; Codier & Codier, 2017; Boyatzis, Gaskin, & Wei, 2015; see Box A.1)

The specific competency for SA is emotional *self-awareness*, defined as a recognition of one's emotions and effects of those emotions on others. The SM domain consists of *emotional self-control*, *adaptability*, *achievement orientation*, and *positive outlook* competencies. Emotional self-control is the characteristic of moderating disruptive emotions and/or impulses. Adaptability is the degree of flexibility one exhibits in dealing with change. Achievement orientation is striving for personal improvement or excellence. Positive outlook is more commonly understood as optimism about present and future situations (Boyatzis, 2018). These personal EI competencies are necessary for an individual to accurately self-assess and recognize individual strengths and weaknesses. Understanding these emotional competencies is vital to managing emotions and is foundational to the manifestation of social competencies (Boyatzis & Goleman, 2017).

The SOA domain encompasses *empathy*, which is appreciation of others' feelings, perspectives, and concerns, and *organizational awareness* competencies. Empathy is a foundational element to understanding others' perspective and experience, enabling a provider to respond in a manner that validates the goals of IP interactions. Organizational awareness is an understanding of the structure, function, and goals of the organization or team. These social competencies are essential to considering the needs of others or a group are considered in addition to one's own needs. The EI domains of SA, SM and SOA are expected to facilitate, promote and foster robust RM.

The RM domain involves sensing emotional undercurrents and power relationships of groups. Adeptness at inducing the best performance in others is at the core of RM and includes

individual competencies of *coaching/mentoring*, *inspirational leadership, influence*, *conflict management*, and *teamwork*. Coach/mentor behaviors are those that understand another's development needs and uses coaching/mentoring strategies to enhance others' performance. The ability to motivate and guide others' behaviors to achieve a common goal defines inspirational leadership, whereas influence describes the ability to affect a course of action that optimizes team performance. Conflict management and teamwork competencies are closely intertwined. The former uses effective negotiation to resolve disagreements, while the latter works within team dynamics to maximize shared outcomes (Boyatzis, 2018).

Competency in Interprofessional Practice and Education

The Interprofessional Education Collaborative (IPEC) was established in 2009. In 2016, IPEC created core competencies of IPP to "create a coordinated effort across the health professions" through convergence of national and global IP competency literature (IPEC, 2016). The four foundational competency domains identified by IPEC included: 1) values and ethics for IPP, 2) roles and responsibilities for collaborative IPP, including leadership, 3) IPHT work and team-based IPP, and 4) IPP communication (IPEC, 2016). These competencies fall within three major foci, IP teamwork (IPT), IP communication (IPC) and IP leadership (IPL). These competencies describe the application of relationship-building values and team dynamics principles expected for each IPHTM to effectively plan interventions for optimal patient outcomes, not only from the perspective of their specialty, but the IPHT as a whole (IPEC, 2016). For example, the IPC competency focuses on IPHTM thoughtfully and responsively communicating in such a way that promotes health promotion and maintenance as well as disease prevention and treatment (IPEC, 2016). Coordinated and effective IPC in a complex, fragmented system may reduce medical errors, especially during frequent, necessary patient handoffs (Starmer et al., 2014; Fox et al., 2021). Clear communication in a supportive and

collaborative team environment will promote adherence to a patient management plan that maximizes science-based outcomes and ensures maximal patient safety at its core (Mahmood, Mohammed, & Gilbert, 2021; Amini, Amini, Nabiee, & Delavari, 2019; Roth, Eldin, Padmanabhan, & Friedman, 2019). To actualize this goal, the MEDICC model proposes relationships that blend EI and IP competencies for the IPHT.

Merging EI & IP Competencies

Healthcare professionals are educated and trained differently within respective disciplines, leading to potential miscommunication and competing approaches to care (Forunda, MacWilliams, & McArthur, 2016). Systems such as TeamSTEPPS include communication tools such as SBAR (Situation, Background, Assessment, Response) to reduce communication issues, but these systems are only as good as the end-user commitment to application of these tools. By including exercises guided by EI and IP competencies, such as IP simulation, IP team integration, IP leadership reflective exercises, and IP role journaling, into IPE curricula, underlying behavioral aspects of IPHT dynamics can be addressed. These competencies can be used to focus IPP components of patient safety programs development and delivery, which could, thereby, reduce medical errors and improve patient outcomes.

Most IPE and safety programs do not address aspects of IPHTM EI. However, studies on IPE have demonstrated that immersive IP simulation sessions help participants understand IPHTM unique role contributions and responsibilities, enhance IPC skills, and improve IPHC dynamics (Mahmood et al., 2021; Andersen, Coverdale, Kelly, & Forster 2018). When IPHT integration exercises are focused on organizational awareness, leadership, adaptability, conflict management, and teamwork, they foster effective IPP (Champagne-Langabeer, Revere, Tankimovich, Yu, Spears, & Swails, 2019; Goolsarran, Hamo, Lane, Frawley, & Lu, 2018). This demonstrates a blending of the EI competency domains with IPP competency

domains. In the model, RM is posited as a mediating variable between the other EI competency domains and the IP teamwork, communication, and leadership competency domains. For example, RM is expected to facilitate conflict management to develop consensus, respect and knowledge of IP roles, foster constructive management of disagreement, and promote shared accountability, which are IPT competencies (IPEC, 2016). The MEDICC model can be used to explore best approaches to guide IP simulation that focuses on coaching/mentoring, conflict management, teamwork, and leadership, with the aim of a shared mental model that ensures optimal IPHT dynamics in real-world healthcare delivery (Forunda et al., 2016).

Implications of Using the MEDICC Model

Since most IPE and safety programs do not address EI, using the MEDICC model to explore EI and IP competence can offer ideas for intervention that can promote blending of these competencies. For example, a blended EI and IP competency reflective exercises could prompt IPHTM to consider the salient, but often missed questions of *Do I recognize and manage my emotions well*? or *Am I a good listener?* or *Do I demonstrate interest and concern for others?* (Foster & Mc Kenzie, 2018). These reflective exercises encompass the SA, SM, and SOA domain competencies of *emotional self-awareness, self-control, empathy,* and *adaptability*. *Self-awareness* competency has been shown to be a key component of reflective practice (Ramani, McMahon, & Armstrong, 2019). Another example is the blending EI and IPP in reflective journaling, which allows IPHT participants to gain insights into joint IPP and IPE experiences, IP biases, conflict management, and empathy (Almost et al., 2016; Foster & McKenzie, 2018; Cox, 2018). Understanding the relationships propoed within the MEDICC model can guide development of IP simulation, IP integration exercises, and IP reflective practice to incorporate behavioral aspects frequently absent from IPE and the development and delivery of patient safety programs.

Conclusion

Healthcare systems have become more complex because of interdependence between health practitioners. This interdependence has driven measures focused on a patient-centered safety culture. Some teams are mired in antiquated hierarchies that do not serve a purpose in modern medicine and impede communication. Effective teamwork, communication and leadership among high-functioning IPHT is essential to reduce error, identify potential risks, and strengthen the trust between IPHTM. Understanding the relationships among EI and IP competence within the MEDICC model can help design IP safety measures that enhance and strengthen behavioral skills of the healthcare team.

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Chapter 4: Impact of Emotional Intelligence on Interprofessional Teamwork, Interprofessional, Communication, and Interprofessional Leadership

Abstract

Background: Decentralization of healthcare delivery may hinder effective handoffs creating opportunity for miscommunication of vital information and subsequent medical errors. Fostering effective communication is paramount for interprofessional (IP) teams; however, differing communication styles can promote misunderstanding and conflict. Behavioral aspects of team dynamics and communication that comprise emotional intelligence (EI) may be a solution but are rarely addressed in educational and safety programs.

Purpose: The purpose of this two-phased study was to explore relationships among EI competencies and interprofessional teamwork (IPT), communication (IPC), and leadership (IPL) competencies.

Method: This cross-sectional, exploratory, predictive study focused on first establishing reliability of researcher-developed IP competency instruments. Medical and advanced practice nursing students from multiple universities participated in the pilot and main phases of the study. Relationships were explored among self-awareness (SA), self-management (SM), social awareness (SOA), relationship management (RM), IPC, IPT, and IPL as proposed within the Meshing Emotional intelligence Determinants and Interprofessional Collaboration Competencies (MEDICC) model.

Results: Although most findings did not reach significance, likely due to small sample size, it is notable that SA, SM, and SOA together explained 73% of the variance in RM. Also, collectively EI domains accounted for over 40% of the variance in each IP competency. Finally, IPC and IPT explained 73% of the variance in IPL.

Conclusion: These findings offer preliminary support for further consideration of the inclusion of EI in IP team education and subsequent work dynamics. Findings also offer support for exploring the interrelationships among EI and IPT, IPC and IPL in future studies.

Impact of Emotional Intelligence on Interprofessional Teamwork, Interprofessional Communication, and Interprofessional Leadership

Twenty years ago, the Institute of Medicine released a report that described how medical errors were associated with almost 100,000 preventable patient deaths annually (Kohn, Corrigan, & Donaldson, 1999). Decentralization and fragmentation of healthcare and an increasingly complex healthcare system were noted to be significant contributors to medical error (Kohn et al., 1999; Ouslander, Bonner, Herndon, & Schutes, 2014; Romano, Segal, & Pollack, 2015). In an attempt to reduce medical errors, healthcare educators across all disciplines integrated tenets of quality and safety into educational curricula by introducing students to principles of safe practice early in their professional careers (American Association of Colleges of Nursing [AACN], 2011; AACN 2012; Provonost et al., 2015). Patient safety campaign strategies, such as tool kits to prevent hospital-acquired infections and other specific complications, have demonstrated some success; however, definitive evidence that broaden efforts, such as implementation of surgical checklists, patient safety huddles, and other programs to improve communication among interdisciplinary healthcare teams, has not demonstrated overall error reduction (Gandhi, Berwick, & Shojana, 2016). Differing communication styles among the various healthcare disciplines has been cited as a factor in miscommunication and potential interprofessional (IP) conflict (Almost, Wolff, Stewart-Pyne, McCormick, Strachan, & D'Souza, 2016; Fox, Gadboury, Chiocchio, & Vachon, 2021). For example, physicians are taught to be succinct whereas nurses are taught to be far more descriptive in their written and verbal communication (Foronda, MacWilliams, & McArthur, 2016).

Emotional intelligence (EI) has been described as a person's self and social awareness and the capacity to understand, control, and express one's emotions effectively, and to manage interpersonal relationships empathetically and prudently (Mayer, Salovey, Caruso, & Sitarenios, 2003). Lack of EI could contribute to team conflict and interprofessional (IP) miscommunication

(Godse & Thingujam, 2010; Weiszbrod, 2020). These interpersonal "soft skills" are rarely addressed during implementation of programs to improve IP communication (Foronda et al., 2016). Therefore, health care educators may be able to improve IP communication by focusing critically on elements that introduce IP teamwork and communication skills from the beginning of the educational process (Foronda et al., 2016; Johnson, 2019). IPL education that relies on the principles of EI has been demonstrated to have a significant positive effect on leadership styles (Miao, Humphrey, & Quian, 2018), and those leadership styles in turn facilitate IPT and IPC.

Healthcare delivery occurs within a complex network of interpersonal relationships and IP teams. To better focus on IP collaborative practice relationships and care delivery, the Interprofessional Education Collaborative (IPEC) was established in 2009. IPEC's vision is that "interprofessional collaborative practice is key to safe, high-quality, accessible, patient-centered care" (IPEC, 2016, p 4). To facilitate this goal, four foundational IP collaboration competency domains were established: 1) values & ethics for IP practice, 2) roles and responsibilities for collaborative practice, which includes leadership, 3) IP teamwork and team-based practice, and 4) IP communication practices (IPEC, 2016). Advanced Practice Registered Nurses (APRNs) have increasingly integrated into IP teams with APRNs now exerting critical leadership on these teams (Farrell, Payne, & Heye, 2015). Uniquely educated and qualified, APRNs can move across varying aspects of healthcare systems bridging between and among the diverse interpersonal relationships found on healthcare delivery teams (Weller, Boyd, & Cumin, 2014). Mature experience in nursing practice, coupled with experience grounded in interpersonal relationships, facilitate APRN's ability to adapt different styles when communicating between patients and their family members and the various healthcare delivery team members (D'Antonio, Beeber, Sills, & Naegle, 2014). These interpersonal traits are associated with EI, a topic that is gaining recognition as interprofessional practice (IPP) is normalized across the spectrum of healthcare delivery (Rosenstein & Stark, 2015).

The IP competencies that could initially impact IPP include IP teamwork and team-based practice (IPT) and IP communication practices (IPC). Competency in IP leadership (IPL) also is a critical element for safe and efficient practice.

EI has been associated with the ability to monitor, evaluate, and implement more effective communication strategies in healthcare teams (Cherry, Fletcher, O'Sullivan, & Dornan, 2014; Rosenstein & Stark, 2015). If healthcare educators actively and deliberatively develop strategies to enhance EI among members of IP teams, teamwork and communication are expected to improve and thereby decrease the likelihood of medical errors. Elucidating and systematically describing the interrelationship between the domains of emotional intelligence and their effect on IPT, IPC, and IPL will help healthcare educators develop targeted methods to improve the function of the IP team, which in turn may have a profound positive impact on patient outcomes.

Complexity of current healthcare delivery systems has been associated with communication errors (Almost et al., 2016), and most often the root cause of sentinel events is error in communication (The Joint Commission, 2020). IP teams have become the norm within healthcare delivery, bringing differing communication styles and work habits (Almost et al., 2016; Fox et al., 2021). For optimal IPT and IPC, attention must be directed to *how* information is communicated and understood rather than what is communicated. The "how" is largely dependent on underlying EI competency within these IP teams (Fox et al., 2021). Additionally, best IPT practice includes a common vision of patient care goals (Adamson, Loomis, Cadell, & Verweel, 2018). Competent IPT and IPC facilitate competent IPL. Concentration on EI enhances all IP competencies (Weizbrod, 2020).

Higher EI, primarily competencies in the relationship management (RM) domain has been associated with greater IPT and IPC skills in patient care environments, likely due to heightened emotional awareness (Cherry, et al., 2014; Foronda et al., 2016). Coordinated IPC in a complex,

fragmented system may reduce medical errors, especially during the frequent necessary patient handoffs occurring within these organizations (Starmer et al., 2014; Fox et al., 2021). Some proponents of safe nursing practice promote teaching EI elements to enhance communication skills and clinical practice (Figure D1) (Codier & Codier, 2017; Cox, 2018; Parnell & St. Onge, 2015).

Organizational leaders increasingly recognize that active management of the emotional culture within their organization promotes a culture of safety (Barsade & O'Neill, 2016; National Patient Safety Foundation [NPSF], 2015). Scholars of leadership success in business have understood and published about the connection between EI relationship management and communication skills among high-functioning teams for some time (Maqbool, Sudong, Manzoor, & Rashid, 2017; Terziyan & Kaikova, 2015). Surprisingly these concepts have not been thoroughly investigated in context of the business of healthcare. With the United States' healthcare business expenditures totaling over $3.5 trillion dollars in 2017 (Centers for Medicare & Medicaid Services, 2019), IP teams need to practice effective IPT and IPC skills to deliver cost-effective healthcare and avoid unintended patient harm (Weller et al., 2014). Though there is a dearth of research about how healthcare team effectiveness may be influenced by EI, these well-established concepts from business literature can be adapted and used to enhance healthcare teams. Leaders in the healthcare industry can integrate EI concepts and strategies into the business of healthcare delivery.

Review of Literature

Given the extensive use of EI in business, it is perplexing that EI has not been explored in healthcare research on a more extensive level. Behavioral skills are an important part of interpersonal relationships. Healthcare is science that is delivered in a web of interpersonal relationships. EI, IPT, IPC, and IPL influence the success of those interpersonal relationships, which, in turn, influence safety and quality of care (Roth, Eldin, Padmanabhan, & Friedman, 2019).

Emotional Intelligence: Personal and Social Competencies

After decades of research on non-cognitive intelligence, Salovey and Mayer created the term "emotional intelligence" in 1990 to describe people who possess self- and social awareness and their ability to use this information to guide decision-making (Salovey & Mayer, 1990). Boyatzis further defined EI in a behavioral realm that divides EI into two dimensions: 1) intrinsic *personal* competencies and 2) outwardly manifested *social* competencies (2009). This holistic view suggests EI is a "performance trait or ability, *and* a self-schema self-image and trait, *and* a set of behaviors" (i.e. competencies). The basic dimensions of EI competencies are further divided into personal competencies, which are 1) self-awareness (i.e the ability to identify emotions) and 2) self-management (i.e the ability to use emotions for reasoning and problem solving), and social competencies, which are 3) social awareness (i.e. the ability to understand emotions); and 4) relationship management (i.e the ability to manage emotions in self and others) (See Table C1; Boyatzis, 2018; Codier & Codier, 2017; Goleman, 2005).

Typically, personal EI competence elements become well-formed prior to mastery of social EI competence (Goleman, 2005). Once personal EI competencies are mastered, social EI competencies become more easily manifested, which could theoretically result in improved functioning of IP teams. Personally- and socially-competent EI leaders communicate a shared vision for the team while understanding others' attitudes and emotions (Caruso & Salovey, 2004,).

EI behavior: Trait or Skill

A philosophical debate has divided experts on whether EI is an ability (skill or proficiency) or a trait (inherent quality); many, however, propose that EI is comprised of both (Foster & Roche, 2014; O'Connor, Hill, Kaya, & Martin, 2019). Boyatzis describes EI most holistically as a complex personality model comprised of characteristics that interact on multiple levels and results in observable social behavior (Boyatzis, 2018). For purposes of this study, EI is considered a state

that is an inherent ability that interacts on conscious, subconscious, and unconscious personality levels and is able to be observed as patterns of behavior that translate into EI competencies.

EI in Healthcare Provider Education

EI social competencies, particularly RM, influence teamwork and communication characteristics of IP teams (Almost et al., 2016). The EI competencies are expected to enhance healthy IP teams and interpersonal relationships (Codier & Codier, 2017). Although existing research on developing EI education has been used primarily in the context of organizational leadership in business (Foster & Roche, 2014; Maqbool et al., 2017; Terziyan & Kaikova, 2015) medical school educators are beginning to express interest in developing EI skills in physicians (Bonazza, Cabell, Cheah, & Taylor, 2021; Cherry et al., 2014; Roth et al., 2019; Tiffin & Paton, 2020). As part of this focus, medical schools are designing programs to enhance physician resident's teamwork and communication skills and studying their impact (Bonazza et al., 2021; Cherry et al., 2014; Johnson & Stern, 2013; Mintle, Greer, & Russo, 2019; Mintz & Stoller, 2014; Saxena, Desanghere, Stobart, & Walker, 2017). Healthcare organizations also are exploring personal and social EI in the context of physician professional and administrative leadership positions (Gregory, Robbins, Schwaitzberg, & Harmon, 2017; Nowacki, Barss, Spencer, Christensen, Fralicx, & Stoller, 2017; Throgmorton, Mitchell, Morely, & Snyder, 2016; Khosa, Khan, Bhulani, Miao, Butler, Nasir, & Raggi, 2017). Nursing leaders also have noted the importance of EI in leaders. Heckemann, Schols, and Halfens (2015) called for development of "a reflective framework" to enhance personal and social EI in nursing leadership. Proponents of safe nursing practice have promoted offering formal programs to develop personal and social EI to support leadership and communication skills (Carragher & Gormley, 2016; Codier & Codier, 2017; Parnell & St. Onge, 2015). Though there is interest in building EI in healthcare leaders, to date no

research has been found that explores the relationships among personal and social EI and IP competencies of healthcare team members and leaders.

Healthcare professionals are educated and trained differently across respective disciplines, which can lead to frustrations in communication and competing approaches to care (Foronda et al., 2016). There are systems designed to facilitate safety through IPC. For example, TeamSTEPPS® includes a communication tool named SBAR (Situation, Background, Assessment, Response) that is focused on reducing communication issues (Agency for Healthcare Research and Quality, n.d.). However, these systems are only as good as their end-users' commitment to the consistent use of these tools. There also are missing elements to communication that some of the safety programs do not address. For example, TeamSTEPPS® does not include methods to evaluate or impact underlying behavioral aspects of team dynamics. With this gap identified in the service sector, educators have recommended including not only teaching specific communication tools, but also IP simulation to enhance IPC. Such simulations would focus on patient safety through simulations of conflict resolution, cultural humility, and team science (Forunda et al., 2016), which are rooted in the EI domains of SA, SM, SOA, and RM. Understanding the interaction of these domains will assist healthcare educators to develop comprehensive training programs fundamentally grounded in positive IP behaviors. Positive IP behaviors will reduce IP team miscommunication, thereby reducing errors in healthcare delivery and improving patient outcomes.

Communication and Teamwork Competency: Impact on Practice

Delivery of healthcare is increasingly complex and involves many professional disciplines but managing the work is often reduced to the technical aspects of tasks performed rather than coordination of care (Rosen et al., 2018; Gordon, Baker, Catchpole, Darbyshire, & Schocken, 2015). Coordinating and integrating care necessitates optimal IPT and IPC. These aspects have not been defined well, nor has the impact of social and cognitive nontechnical skills on team

performance or competency. These nontechnical skills have been defined as "a set of social (communication and teamwork) and cognitive (analytical and personal behaviour) skills that support high quality, safe, effective, and efficient inter-professional care within the complex healthcare system" (Gordon et al., 2015, p. 572). Effective communication and teamwork cannot be disassociated from the personal behaviors and relationships of each team member (Lee & Doran, 2017). Studies examining the relationships between teamwork and communication have indicated that these skills can be enhanced with education (Forunda et al., 2016). The precursor to successfully developing curricular adjuncts specific to enhancing IP social and cognitive competencies of communication and teamwork is the empiric examination of the behaviors that underlie these competencies. This study aimed to provide an initial framework for empiric examination.

Theoretical Framework

The personal EI competencies are SA (i.e the ability to identify emotions) and SM (i.e the ability to use emotions for reasoning and problem solving) encompass internal processes. The social EI competencies of SOA (i.e. the ability to understand emotions) and RM (i.e the ability to manage emotions in self and others) are outwardly manifested, and easier to observe (Codier & Codier, 2017; Goleman, 2005).

The IPEC framework has been used extensively by healthcare educators and IP education development teams (Figure D2). These educational competencies are from the collaborative efforts of six founding educational organizations from the health disciplines of dentistry, nursing, medicine, osteopathic medicine, pharmacy, and public health. The IPEC's mission was to develop core competencies for IP collaborative practice based on already-established discipline-specific competencies. The four foundational IP collaboration competency domains: 1) values & ethics for IP practice, 2) roles and responsibilities for collaborative practice, 3) IP teamwork and team-based

practice, and 4) IP communication practices (IPEC, 2016; Figure D2) and the personal and social EI competency domains comprise the theoretical frameworks that underpin the proposed model for incorporation of EI into IP healthcare education.

The IP competency domain Values/Ethics for Interprofessional Practice contains significant elements of humanism and morality, according to IPEC (2016). This domain emphasizes that teamwork includes not only the values of the IP team, but also the moral agency of the community at large. Ethics are core values in all health care professions, and mutual respect and trust are essential underpinnings to IP approaches to health care. Interprofessional ethics are considered a moral obligation of all health care professionals. The other three competencies are the focus of this study.

Based on the combined IP and EI competencies, a testable model was designed proposing relationships among IP and EI variables, entitled the *Meshing Emotional intelligence Determinants and Interprofessional Collaboration Competencies* (MEDICC) model (Figure D3). This model is the basis for the study conducted.

The personal EI competency domain SA includes the individual competency of emotional self-awareness, defined as a recognition of one's emotions and effects of those emotions on others. The personal EI competency domain SM consists of emotional self-control, adaptability, achievement orientation, and positive outlook. Emotional self-control is the characteristic of moderating disruptive emotions and/or impulses. Adaptability is the degree of flexibility one exhibits in dealing with change. Achievement orientation is striving for personal improvement or excellence, and positive outlook is more commonly understood as optimism about present and future situations (Boyatzis, 2018). The personal EI competencies are necessary for an individual to accurately self-assess and recognize personal strengths and weaknesses. Understanding of these emotional competencies is vital to managing emotions and is foundational to the manifestation of

social competencies. Aggregate data from Boyatzis & Goleman's extensive research demonstrate that SA is a pivotal EI competency and without it, scores in other EI domains are likely to be low (Boyatzis & Goleman, 2017). Individuals with low SA score lower in empathy, inspirational leadership, conflict management, influence, and coach/mentor, the majority of which are part of RM (Boyatzis & Goleman, 2017).

The EI SOA competency domain encompasses empathy, which is appreciation of others' feelings, perspectives, and concerns; and RM that involves sensing emotional undercurrents and power relationships of groups. In the model, the EI RM domain is posited as the mediating variable between the other EI domains and the IP variables of interest. Adeptness at inducing the best performance in others includes individual competencies of coaching/mentoring, inspirational leadership, influence, conflict management, and teamwork. Coach/mentor behaviors are those that understand another's development needs and uses coaching/mentoring strategies to enhance others' performance. The ability to inspire and guide others defines inspirational leadership, whereas influence describes the ability to persuade others to a course of action that optimizes their performance. Conflict management and teamwork competencies are closely intertwined. The former uses effective negotiation to resolve disagreements, while the latter works within team dynamics to maximize shared outcomes (Boyatzis, 2018). Specifically, conflict management consists of developing consensus, respect and knowledge of IP roles, constructive management of disagreement, and shared accountability, as reflected in the teamwork competencies outlined by IPEC (2016). One aim of this study is to explore the relationships among the personal and social EI domains and RM as well as the influence RM has on IPT, IPC, and IPL.

The RM domain has shared leadership competencies between EI and IPL, including *teamwork*, *influence*, *conflict management*, *coach/mentor*, and *inspirational leadership.* These RM domain competencies are more readily observed as outwardly manifested social components of EI.

RM competencies are expected to influence IP teamwork, communication, and leadership behaviors.

The concept of IPT was drawn from IPEC's description of application of relationship-building values and team dynamics principles for each team member to "plan, deliver, and evaluate safe, efficient, and equitable" outcomes not only from the perspective of their specialty but the team as a whole (IPEC, 2016). According to the IPEC, the IPC competency requires health professionals to communicate in "a responsive and responsible manner that supports a team approach to the promotion and maintenance of health and the prevention and treatment of disease." (IPEC, 2016). Another competency domain from IPEC is roles and responsibilities for collaborative practice (IPEC, 2016). Out of this competency the concept of IPL was extracted in that this focuses on interdependence and complimentary practice inherent in collaboration. Leaders enable this collaboration and therefore, this one aspect was used in the study versus the entire competency.

Based on synthesis of the literature, IPT and IPC competencies are influenced by the personal and social EI domains as key variables, especially RM, within the study model. The RM social EI domain contains outwardly manifested EI competencies, and it is expected that higher score in the RM domain will predict higher scores in IPC, IPT, and IPL (see Table C2).

Proposed MEDICC Model

The primary premise for the MEDICC model is that RM competencies are required for optimal IPC, IPT, and IPL behaviors. The RM domain is where the shared leadership competencies between EI and IPL reside, such as *teamwork*, *influence*, *conflict management*, *coach/mentor*, and *inspirational leadership.* This specific domain contains competencies that are expected to have the most influence on IP behaviors related to teamwork, communication, and leadership, and central to the theoretical framework for this study. Furthermore, the proposed

MEDICC model (Figure D3) posits that the RM domain will be the mediating variable between the other EI domains and IPT, IPC, and IPL. For this to be a feasible premise, there must be a direct relationship between RM and IPL.

From a comprehensive review of the literature about personal and social EI and established relationships with to teamwork and communication in the business literature, specific elements were identified in each domain that were most strongly related to APRN competencies as expressed in the Quality and Safety Education for Nurses (QSEN) and the Essentials of Master's Education in Nursing (AACN, 2011; AACN, 2012). The APRN and personal and social EI competencies were presented in a matrix cross-walking EI domains with teamwork, communication, and leadership (Cox, 2018). Consideration was then given to how all four EI domains would influence the IP team dynamic, and IPEC competencies (IPEC, 2016) as well as they were added to the crosswalk. Based on these cross-walked competencies, the MEDICC model (Figure D3**)** was proposed to illustrate how personal and social EI domains of SA, SM, SOA predict RM, how RM predicts IPT, IPC, and IPL, and finally how IPT and IPC predict IPL. Further, the model proposes that SA, SM, and SOA competencies are associated.

Conceptual and Operational Definitions

The study aim was to explore relationships among EI domains and IP competencies within the IP community, particularly APRNs/medical students. The study variables included the personal and social EI domains of SA, SM, SOA, and RM and the IP competencies of IPC, IPT, and IPL (see Table C2). From the literature and the MEDICC model, several research questions were proffered.

Research Questions

Seven research questions were posed for this study. Questions were asked about the direct relationships within the EI domains, specifically RM and IP competency relationships, and RM predicting IP competencies (see Table C3).

Design

This cross-sectional, exploratory, predictive study was comprised of two phases. Phase 1 was a pilot study to determine the reliability and internal consistency of the researcher-developed instrument to measure IPT and IPC. Phase 2 was the main study which examined the relationships between EI and IP competencies. The strength, direction, and magnitude of these relationships was predicted to provide support for the proposed MEDICC model.

Methods

The pilot study information will be presented first, followed by the main study.

Pilot Study

A pilot study was conducted to determine the internal consistency of the researcher-developed instruments measuring IPT, the Interprofessional Teamwork Competency Inventory (IPTCI; see Appendix E2) and IPC, the Interprofessional Communication Competency Inventory (IPCCI; see Appendix E3). The inventory instruments were based on the IPT and IPC competencies established by Interprofessional Education Consortium (IPEC). These IPEC competencies have established content validity from the input of six founding professional educational organizations of medicine, osteopathic medicine, dentistry, nursing, pharmacy, and public health (IPEC, 2016).

Design

The design for the pilot was a cross-sectional descriptive study.

Sample

The pilot convenience sample consisted of 3rd year medical students and APRN students recruited from a pool of approximately 200 students. Students were from a medical school in the southwest and a nursing school in east Texas. Student email addresses were obtained from medical school faculty with IRB approval. A list of APRN student email addresses was obtained through the Public Information Coordinator at the university in which the nursing school resides. Students were recruited via an email invitation that explained the pilot purpose, risks and benefits, and instructions for participation (See Appendix F1). If students chose to participate, they were instructed to click the hyperlink to the pilot questionnaire that was embedded within the recruitment email. Approximately 100 medical students and 100 APRN students were invited to participate in the pilot study. The sample size for the pilot was 56, which was approximately a 28% return rate.

Ethics

Primary approval for the pilot study was obtained through the University of Texas at Tyler Institutional Review Board (IRB; Appendix G). Additional approval was obtained through the Texas Tech University Health Sciences Center Paul L. Foster School of Medicine IRB (See Appendix G). After IRB approval, medical and nursing students' email addresses were obtained as described above. All email lists were kept on a password-protected computer in a locked office. The recruitment email sent to potential pilot study participants included: purpose of the pilot study, what data collection would occur, details and descriptions of the study questionnaire, potential risks and benefits of participation, right to withdraw from study without penalty, emphasis on participation as voluntary, that participants would remain anonymous, and the contact information

of the principal investigator of the study. The email emphasized that participation is voluntary and that participants would remain anonymous.

Methods

Measurement. The IPT and IPC inventories are researcher-developed instruments that are based on the IPEC competencies for interprofessional teamwork (IPT) and interprofessional communication (IPC). The 8 IPT competencies were translated into 8 items on the IPT competency inventory (IPTCI; Appendix E2) and the 11 IPC competencies were translated into 11 items for the IPC competency inventory (IPCCI; Appendix E3). The IP competency inventories asked to what extent participants perceived that they exhibited either IPC or IPT, with responses on a 5-point Likert scale, ranging from 0– 4; 0= not at all; 1= small extent, 2=moderate extent, 3=large extent, 4= great extent.

Data collection. An online study questionnaire using the Qualtrics™ platform was created containing the IPTCI and IPCCI and additional demographic questions of self-identified gender, age, ethnicity, years of education and role (whether medical student or APRN student), and if they are a second career student (See Table C4). The study questionnaire was offered electronically and confidentially to all potential participants

There was a link at the end of the study questionnaire that took participants to a separate survey in which they could voluntarily share their contact information to enter into a drawing for a prize as an incentive for participating in the pilot study. Data collected for the drawing were completely separate from the study questionnaire data. The prize was an Amazon Echo Dot. Seven participants completed the prize drawing.

Analysis & Results. The data from the study questionnaire were downloaded to an Excel spreadsheet from Qualtrics™ and analyzed for data completeness. There were no missing data in completed surveys. Those surveys that had less than complete data were deleted. IBM SPSS 28

was used to determine the reliability statistics for the two inventories. Cronbach alphas for the IPTCI and IPCCI in the pilot sample were .886 and .843, respectively (see Table C5). Therefore, the instruments were deemed acceptable for use in the study.

Main Study

The main study explored relationships among EI domains and IP competencies as guided by the study model, MEDICC.

Sample

A convenience sample of APRN and 4th year medical students were recruited from a variety of nurse practitioner programs and one medical school in the southwest region of the United States. Inclusion criteria included: (a) students enrolled in a graduate-level nurse practitioner program or medical school at the participating facilities (b) age >18 years (c) ability to read and speak English (d) currently owns and uses a personal computer with internet access. Medical students' email addresses were obtained from the medical school faculty with IRB approval. A list of APRN student emails was obtained through the Public Information Coordinator at each school of nursing, with IRB approval. At one school of nursing, the recruitment email was sent to an administrative assistant to distribute to the students instead of coming directly from the researcher. The students that decided to participate responded by providing their email to the researcher through the Qualtrics™ platform. The researcher then used those emails to invite participation in the study through the Korn Ferry platform that the ESCI-U is housed on. Those students then completed the ESCI-U and then opened the Qualtrics™ survey and entered the randomly-generated user code from ESCI-U and completed the Qualtrics™ survey. A total of 350 students were invited with 35 responses for a response rate of 10%.

Protection of Human Subjects

Primary approval for the main study was obtained through the University of Texas at Tyler Institutional Review Board (IRB). Additional approvals were obtained at the Texas Tech University Health Sciences Center Paul L. Foster School of Medicine IRB and the University of Texas at El Paso IRB. After IRB approval, medical and nursing student email addresses were obtained as described above. All email lists were kept on a password-protected computer in a locked office. Potential participants were informed of the study via the recruitment email that included: purpose of the study, what data collection would occur, details and descriptions and instructions for the study questionnaires, potential risks and benefits of participation, right to withdraw from study without penalty, and the contact information of the principal investigator of the study (Appendix F2). Data was kept on a password-protected computer through the study period. Once the study is completed, the data will be purged.

Instruments

EI domains were measured by the four subscales of the proprietary Emotional and Social Competency Inventory-University (ESCI-U). The ESCI-U subscales represented the EI domains SA, SM, SOA, and RM. The IPT and IPC competencies were measured by the researcher-developed inventories IPTCI, and IPCCI. The IPL competencies were measured by an adapted inventory based on the valid and reliable public domain measure the Interprofessional Collaboration Assessment Inventory (ICAR®), which was re-titled as the Interprofessional Leadership Competency Inventory (IPLCI). All measures within the study were self-perception measures. While there may be inherent methodological weaknesses present with self-perception data, for this study, self-perception was what was intended to be measured. For this study, self-perceived EI, IPT, IPC, and IPL was of greater interest than third party observational data about

study participants. Understanding how participants perceive their EI and IP competence is the foundation for the exploration of the study relationships.

The study variables EI, IPT, IPC, and IPL were measured by: 1) four subscales of the ESCI-U; 2) the IPTCI, 3) the IPCCI, and 4) the IPLCI, respectively. Higher scores on each measure reflected higher levels of the measured construct. The study questionnaire also included the same 6 demographic questions as the pilot (See Appendix E1). Cronbach alphas for each measure for this study were acceptable (see Table C5).

Emotional and Social Competency Inventory-University (ESCI-U). The ESCI-U was chosen for this study because for this study, EI is considered a mix of traits, abilities, and characteristics, rather than a narrower view of EI as *either* a trait *or* an ability. The mixed-model approach of the ESCI-U and the abundance of studies supporting its use made it the instrument of choice (Brackett & Mayer, 2003; Boyatzis, 2009: Boyatzis, 2018; Boyatzis & Gaskin, 2010; Boyatzis, Gaskin, & Wei, 2015). The ESCI-U is available through the Korn-Ferry Hay Group and was designed specifically for use in University students. The ESCI-U required completion on the Korn Ferry platform. When participants logged into the online scale, each participant was assigned a random code by Korn Ferry. Participants were then able to access the ESCI-U, which is a 68-item survey with four subscales, representing each of the four EI domains and a fifth subscale focused systems thinking and pattern recognition. These eight questions were not included in analysis for this study. Each of the four EI subscales used in this study were specific to the competencies contained within that domain. The SA domain subscale (emotional self-awareness) had 5 items; the SM domain subscales (achievement orientation; adaptability; emotional self-control; positive outlook) had 20 items; the SOA domain subscales (empathy; organizational awareness) had 10 items; and the RM domain subscales (teamwork; inspirational leadership; influence; conflict management; coach and mentor) had 25 items. These 60 items represented the 12 EI competencies

and their respective domains (see Table C1). Participants were asked to indicate how characteristic a behavior is for them on a 5-point Likert scale, with one meaning never and five meaning consistently. Subscale ESCI-U scores were used in as distinct measures in this study.

It should be noted that the ESCI-U was originally designed to be a 360-type evaluation (Boyatzis & Goleman, 2017), with three scores per participant: 1) their own and 2) two observer colleagues. For this study, however, only the participant evaluation was included in the analysis.

The ESCI-U has been shown to be valid and reliable for each of the EI domain subscales (Brackett & Mayer, 2003; Boyatzis, 2009: Boyatzis, 2018; Boyatzis & Gaskin, 2010; Boyatzis, Gaskin, & Wei, 2015), with the Cronbach alphas hovering around .80 (Boyatzis & Goleman, 2017).

Interprofessional Measures. Researcher-developed measures for IPT, and IPC, and the adapted and IPL measure were used in this study. The IPT and IPC measures were based on competencies developed by IPEC (2016), and the IPL measure was adapted from ICAR® (Curran et al., 2010). There are no other known measures for these constructs. The content validity for the IPTCI and IPCCI was established by IPEC. Reliability of these inventories was established in the pilot phase of this study (.886 & .843 respectively).

Interprofessional Leadership Competency Inventory (IPLCI). The Interprofessional Leadership Competency Inventory (IPCLI) was adapted with permission from ICAR® (Curran et al., 2010). The original observational measure delineated the level to which participants are observed as meeting criteria for novice to mastery across 31 competencies. These 31 competencies are clustered in 6 dimensions: 1) Communication, 2) Collaboration, 3) Roles and Responsibility, 4) Collaborative Patient/Client-Family Centered Approach, 5) Team Functioning, and 6) Conflict Management. Given that leaders would be expected to perform at a mastery level, for the purposes of measuring IPL, the mastery elements of each of these dimensions were collated into the IPL

competency inventory. Participants were to indicate the extent to which they perceived themselves to be competent in each of the 31 mastery IPL competencies on a 5-point Likert scale (0-4: 0=not at all, 1=small extent, 2= moderate extent, 3=large extent, 4= great extent).

Data Collection

Given that the ESCI-U is proprietary, the Korn Ferry/Hay Group, owner of the rights to ESCI-U, required data to be collected on the Korn Ferry online platform. This requirement guided data collection. Participants were required to consent to participation before their emails were shared with Korn Ferry, who were then sent a hyperlink to the ESCI-U to participants so they could access the ESCI-U from the Korn-Ferry platform. Instructions in the recruitment email directed the participants to the study questionnaire link in Qualtrics™ that accessed the demographic questions and IP inventories. To connect data from ESCI-U and the study questionnaire, participants were asked to provide the unique ESCI-U code as the first question on the study questionnaire. 350 potential participants were sent a link to the ESCI-U from Korn Ferry, with 24 participants completing the instrument. To enhance data collection, before participants submitted the study questionnaire, a reminder was provided to not submit their information before they completed the ESCI-U. This was intended to decrease the likelihood of missing data; however, the data collection process was likely too complicated as there were only 12 matched surveys with useable data.

There was a link at the end of the study questionnaire that took participants to a separate survey in which they could voluntarily share their contact information to enter into a drawing for a prize as an incentive for participating in the complex data collection. Data collected for the drawing were completely separate from the study questionnaire data. The prizes were a Bose Soundtouch 10 wireless speaker and an Amazon Fire TV Stick. Twenty-nine participants completed the prize drawing.

Analysis

Summative scores were calculated for each of the EI domains and each of the three IP inventories. SPSS was used to conduct relevant analyses to answer the research questions. Given that the minimum sample size to analyze 11 predicted pathways was 110 (Edwards & Lambert, 2007), with 22 in the overall sample and 11 matched complete cases, all analyses were considered pilot work to explore relationships; however, data could not be reliable for inferring sustainable relationships.

All data were combined into one file to connect ESCI-U data with demographics and IP inventory data using the Korn Ferry unique code. The researcher cross-checked the full dataset to ensure that ESCI-U data was properly matched to the IP and demographic data before analysis. Data for each participant who complete the proprietary ESCI-U were provided by subscale from the Korn Ferry company by email to the researcher in an Excel spreadsheet that included the unique random code as participant ID. All cases without complete data were deleted. There were 25 cases of completed ESCI-U data. The data provided by Korn Ferry were color-coded by EI domain so that all subscales within each domain were clearly recognizable. Subscale means for each participant were summed for each domain and a total mean for each domain was calculated to use in the analysis (See Table C6). Demographic data and IP inventories data were retrieved from Qualtrics^{TM}. For all IP inventories, for each participant items were summed and then a mean was calculated to use for analysis. All variables had means within the 1-5 range.

Frequencies and percentages were used to examine the nominal and ordinal level variables, with means and standard deviations used for the continuous-level data (see Table C9). A correlation matrix provided initial relationships among study variables (see Table C10). Each research question was answered with analyses specific to the question (see Table C3). Independent sample *t*-tests were conducted to explore how demographics

influenced study variables. A series of linear regression analyses were conducted to examine the research questions 1-3. To address the research questions 4-6, Baron & Kenny's (1986) method for mediation was utilized, using sequenced regression models. Complete mediation occurs when all four regression steps are supported. If steps 1-3 are met, but step 4 is not met, partial mediation was supported. Statistical significance was accepted with $\alpha = .05$. The 11 cases with completed data for ESCI-U and the study questionnaire were used for analysis.

Results

Twenty-five participants responded to the ESCI-U. Twenty-two participants responded to the IP study questionnaire. The main study demographics (see Table C7) indicated the sample was comprised of 5 males (14.3%) and 17 females (48.6%). Thirty-seven percent of participants did not indicate gender. Though the data were collected in a region with a majority of the population identifying as White (Hispanic) or Other (Hispanic or Latino) (82%; DataUSA.io), in this sample, no students identified as Non-White Hispanic or Latino. Of note, 40% of participants did not indicate race. This sample included 37% medical students and 26% APRN students. Thirty-seven percent did not indicate student status. Twelve percent of participants indicated they had a prior career path.

Cronbach alphas established adequate internal consistency and reliability for all measures in this study (see Table C8). Composite mean scores were generated for all study variables for the 11 cases with completed data.

Healthcare Professions Students Emotional Intelligence

To help further understand EI in healthcare professions students, all 25 participant's data were examined. All EI domain means were over 4, which indicated that most participants perceived themselves as emotionally intelligent (see Table C9). Of note, the personal competence domains had both the highest mean score (SM) and the lowest mean score (SA), which offers opportunity to consider how participants may have understood the items within each of these domains' subscales. Korn Ferry does not share item level data so this could not be further explored in this sample. That said, Achievement Orientation SM domain subscale had the highest mean, which could indicate some social acceptability bias, as the sample was in health professions students who are expected to be achievers.

To help further understand IPP in healthcare professions students, all 22 participant's data who completed the study questionnaire were examined for each of the IP competency inventories. The IPCCI mean was 3.85 (*SD* = 0.71) indicating some participants were unsure of their IP communication competency, which was the lowest mean among the IP variables. The IPTCI mean was 4.01 (*SD* = 0.69), indicating participants were confident in their IP teamwork competence, which was the highest mean among the IP variables. The IPLCI mean was 3.94 (*SD* = 0.68), indicating some participants were unsure of their IP leadership competence.

Given the overall perspective for healthcare professions students in this sample, analyses were conducted to discern how the subgroups, medical students and APRN students, differed on the IP variables. In this sample, there were significant differences between medical students and APRN students on all EI domains except for SA (see Table C11), with APRN students scoring significantly higher on all three domains, SM ($t[10] = -2.89$, $p = .016$), SOA ($t[10] = -2.35$, $p = .041$), and RM ($t[10] = -2.41$, $p = .037$)

Research Questions Answered

To address the research questions (Table C3), a series of linear regressions were conducted to examine direct and mediating effects. A linear regression is appropriate when testing the predictive relationship between independent variables and a continuous dependent variable (Tabachnick & Fidell, 2019). Prior to analysis, the assumptions of a linear regression were tested and found to be met in this sample.

RQ1: Does SA, SM, and SOA have a direct effect on RM? This question was answered yes (see Table C11). Study variables SA, SM, and SOA were shown to collectively have a direct effect on RM ($F(3, 21) = 18.84$, $p<.001$). Together, SA, SM and SOA accounted for 73% of the variance in RM. On further analysis of the individual relationships, the study variable SA was not a significant predictor of RM (β=.097, p=.508). However, study variables SM (β=.399, p =.048) and SOA (β=.436, p =.050) were significant predictors of RM and contributed the largest amount of variance accounted for in RM.

RQ2: Does RM have a direct effect on IPT and IPC? This question was answered no (see Table C12). The study variable RM did not statistically significantly predict IPT ($F(1, 10) = 2.53$, p=.143; β=.449, p=.143) or IPC ($F(1,10) = 2.09$, p = .179; β=.416, p=.179). However, in this sample, RM did account for 20% of the variance in IPT (R^2= .202) and 17% of the variance in IPC (R^2= .173), indicating that there may be meaningful relationships that, due to sample size, did not meet significance. While RM was not a significant predictor of IPT or IPC in this sample, RM would be an important variable to include in future studies about EI and IPP.

RQ3: Does RM have a direct effect on IPL? This question was answered no (see Table C12), as RM did not significantly predict IPL ($F(1,10) = 0.96$, p = .35; β=.311, p=.352). However,

in this sample, RM accounted for 10% of the variance in IPL (R^2 = .097), which indicates that there may be a relationship that with a larger sample size may reach significance.

RQ4: Does RM have a mediating effect between SA, SM, and SOA and IPL? This question was answered no (see Table C13). In this sample, SA, SM and SOA was shown to have a direct effect on RM ($F(3, 21) = 18.84$, $p < .001$), accounting for 73% of the variance (R^2 = .729). However, RM did not have a direct effect on IPL (β=.645, p=.432), which would prohibit mediation. That said, though the study variables SA, SM, and SOA had no significant direct effect on IPL ($F(3,7) = 1.26$, $p = .358$), in this sample, together, SA (β=.385, p=.343), SM (β=.865, p=.175) and SOA (β=-0.818, p=.215) accounted for 35% of the variance in IPL (R^2 = .351). These findings would indicate there may be a meaningful relationship, but it may not have met significance due to small sample size. Though RM, SA, SM and SOA were shown collectively to have no significant direct effect on IPL *(*$F(4, 6) = 1.09$, $p = .441$), together they accounted for 42% of the variance in IPL (R^2 = .420). This important finding may indicate that there is a meaningful relationship between the EI domains and IPL.

RQ5: Does RM have a mediating effect between SA, SM, and SOA and IPT and IPC? The answer to RQ5 was no (see Table C15 and C17). In this sample, SA, SM and SOA did not have a significant direct effect on IPT ($F(3,8) = 1.03$, $p = .430$) or IPC ($F(3,8) = 1.66$, p = .252), although these variables accounted for 28% and 38% of the variance in IPT (R^2 = .279) and IPC (R^2 = .384), respectively. RM also did not have a direct effect on IPT (β= 1.059, p=.080) or IPC (β=.799, p=.172), which prohibits mediation. Though RM, SA, SM and SOA were shown collectively to have no significant direct effect on IPT ($F(4, 7) = 2.12$, $p = .181$) or IPC ($F(4, 7)$ = 2.03, $p = .195$), together they accounted for 55% of the variance in IPT (R^2 = .548) and 54% of the variance in IPC (R^2 = .537). These important findings may indicate that there are meaningful relationships between the EI domains and IPC as well as EI domains and IPT.

RQ6: Does IPC and IPT mediate the relationship between RM and IPL? The answer to RQ6 was no (see Table C19). In this study, RQ2 analyses established that RM did not have a significant direct effect on IPL and accounted for only 9% of the variance. In this sample, the relationship between RM and IP domains IPT and IPC is weak to moderate (β=.449, p=.143; β=.416, p=.179, respectively), accounting for less than 21% of the variance. These data could lessen the likelihood that IPT and IPC mediate a relationship between RM and IPL.

While mediation between RM and IPT was not likely, the IPC domain had a significant direct effect on IPL (β=.672, p=.023) and accounted for 67% of the variance in IPL. The IP domain of IPT also had a significant direct effect on IPL (β=.856, p=.001) and accounted for 86% of the variance in IPL. Together, these variables accounted for 73% of the variance in IPL (R^2 = .734, p=.005). In further exploration, RM and IPT together accounted for 75% of the variance in IPL (R^2 = .745, p=.004), and RM and IPC together accounted for 45% of the variance in IPL (R^2 = .452, p=.09) and From these data, the IP domain of IPT emerges as a stronger predictor of IPL than IPC or RM in this sample. The study data support a robust relationship among the IPP domains and EI domains, although most are not significant, which is likely due to sample size in this study.

Further Analysis

To understand further about variance in IP domains accounted for by EI domains additional analyses were conducted (see Tables C14, C16, C18). A hierarchical regression to evaluate total variance accounted for in the downstream variables revealed that SA, SM, and SOA explained 26% of the variance in IPT (R^2 =.255) initially. With the addition of RM, IPT variance accounted for was 43% (R^2 change = .179, F change (1,6) = 2.212 p = .181). This finding would suggest that EI explained almost half of the total variance in IPL in this sample. Similarly, SA, SM, and SOA domains accounted for 36% of the variance in the downstream variable IPC (R^2 =.358), with RM adding additional 9% (R^2 change = .093, F change (1,7) = 1.193 p = .311). This finding suggests

that almost half of the total variance in IPC was explained by EI domains in this sample. Finally, SA, SM, and SOA were found to explain 34% of the variance in the downstream variable IPL (R^2 =.338), RM adding only 2% (R^2 change = .015, F change (1,7) = 1.36, p = .725) to total of 35% of the variance explained in IPL by EI domains in this sample. The findings from this study indicate that there could be meaningful relationships among EI and IP domains.

In the correlation matrix, the relationships between the variables can be seen more clearly (Table C10). SA and SM were positively correlated r(23) = .49, p = < .05, as were SA and SOA r(23) =.62, p < .01, and SA and RM r(23) = .57, p < .01. As expected, self-awareness is an important part of all of the EI variables. There were also strong positive correlations between SM and SOA r(2) =.80, p < .001, and SM and RM r(23) = .80, p < .001. Self-management is obviously crucial to social interactions and managing relationships, since self-control is an expectation in professional interactions, and this research demonstrates the strong correlation between these variables. RM was strongly positively related to SOA r(23) = .82, p < .001 in addition to SA and SM. As predicted, RM is the key to managing IP interactions.

For the correlations with the IP variables, there were no strong correlations with the EI variables, however, both IPT and IPC were highly correlated with IPL (r[18)]= .94, p < .001; r[18] = .83, p < .001). Additionally, IPT and IPC were strongly correlated at r(20) = .88, p = < .001. It is obvious that teamwork and communication are essential to good leadership, and that good teamwork and clear communication are vital to positive IP work.

Discussion

Exploration of the potential relationships among EI domains and IP domains within this study (IPC, IPT, & IPL) as illustrated in this study's findings offer opportunity to consider implications for both practice and research. The MEDICC model was partially supported by study findings, but further validation of model relationships is required.

The differences in EI domains between the medical students and APRN students is important to consider. Given the pilot nature of this study, further understanding of why APRNs may have higher SM, SOA, and RM than the medical students could be explored in further research. The notion that nursing, as a science, is grounded in interpersonal relationships and skills, and the fact that APRN students have worked as Registered Nurses (RNs) prior to entering APRN programs may influence their EI competency. For example, interpersonal relationships encountered by the RNs in their work could enhanced their interpersonal skills, and, thereby contribute to higher EI. Furthermore, musing that many of the individual competencies for the EI domains are characteristics similarly used to describe the art of nursing, such as self-awareness, adaptability, empathy, conflict management, teamwork may reflect higher levels of EI (Thorne, 2020) as well as IP competency. Nurses may define themselves within the context of the IP work they do, whereas the medical students may not have yet established an identity as a working professional. APRN students and medical students engage academia differently, with nurses adapting more readily due to different communication and leadership styles than medical students due to experience in nursing practice and interpersonal work relationships. Medical students often have only experienced the IP team as students versus independent healthcare professionals. Mintle et al. (2019) found that EI declined slightly in medical students in preclinical education, but this may be due to medical students' immersion into studies in the preclinical environment, rather than focused on building competency in interpersonal relationships, which are foundational to becoming a successful physician (Emanuel & Gudbranson, 2018; Mintz & Stoller, 2014). In medical school students are judged on academic performance rather than behavioral skills that are required to function in an IP environment. In addition, caring as an applied construct is an essential component of nursing education and on-the-job performance, therefore the culture of nursing may influence EI and IP competencies differently than the culture of medical education.

The relationships with in the MEDICC model were somewhat supported in this sample, in that when SA, SM, and SOA are strong, in this sample it would be expected that RM would be strong. Given that the largest contributor to RM was SOA, which includes the competency of *empathy*, APRNS may have more developed skills with which to understand another's point of view. It has been shown that interprofessional empathy has been found to be "a precursor to interprofessional collaboration" (Adamson, Loomis, Cadell, & Verweel, 2018). Interprofessional empathy is the essence of IPT and IPC, and without it, IP collaboration is unlikely. This may lead to parallel or siloed work and decreased patient outcomes, particularly when there is no shared higher goal (Adamson et al., 2018).

Given that SM includes the competencies of emotional self-control and adaptability and was the next largest contributor to RM, it bears noting that both of these attributes are part of interpersonal interactions in effective IPT. The quality of IPT has been linked to the quality and safety of health care delivery itself (Rosen et al., 2018) and poor teamwork has been shown to increase morbidity and mortality fivefold (Mazzaco et al., 2009; Kang, Brom, Lasater, & McHugh, 2020). Therefore, investing in SM and SOA may result in better RM, which may contribute to enhancing IP work. Further research is required to establish that IP interactions rely heavily on RM, though this pilot study offers promise in pushing that direction.

When answering the question whether RM predicts IPT and IPC, the statistical answer was not significant, but there is still a finding worth investigating regarding RM's relationship to IPT and IPC. The effects of RM within IPT have not been studied previously, but social psychologists suggest that behavioral "soft skills" are fundamental to effective IPT (Adamson et al., 2018). IPC in research is often treated strictly as information exchange, rather than the looking at the "how" of information exchange and its behavioral nuances (Fox, Gaboury, Chiocchio, & Vachon, 2021). This researcher has proposed that attention to EI skills within IPT and IPC will improve IP attitudes

and group dynamics, and lead to better patient outcomes. Instruments such as TeamSTEPPS® are only tools to foster IPC and IPT just as a scalpel is an instrument. The important difference is in the skill of the person wielding the scalpel that makes it a successful instrument, not the instrument itself. The same argument can be made for the interpersonal skills it requires to be effective in IPT and IPCT. RM skills are a large part of IPC and IPT.

According to the regression performed to see if RM has a direct effect on IPL, there was no statistical evidence that RM directly affects IPL, however RM did account for 10% of the variance in IPL. As mentioned previously, the small sample size in this study may have affected finding statistical significance, but the individual competencies listed under RM (inspirational leadership, influence, coach/mentor, conflict management, and teamwork) are all desirable characteristics of IPL as listed by IPEC. Specifically, IPEC sub-competencies list positive IP working relationships, instructive feedback, conflict resolution, and "leadership practices that support collaborative practice and team effectiveness" (IPEC, 2016). These sub-competencies speak directly to those individual competencies of RM and therefore bear further study.

The strength of the contributions of SA, SM, SOA, & RM to IPL is important since it supports the idea that the social aspects of EI heavily influence IPL. More than a few studies endorse the idea that social intelligence is the key to optimal leadership (Boyatzis, 2009; Codier & Codier, 2017; Gransberry, 2021; Bryan, 2021). Unfortunately, most of these studies are in the business or foreign healthcare literature and have not been applied to leadership in US healthcare. Optimal leadership principles have evolved to encompass a leader's ability to establish good interpersonal connections with team members that rely heavily on the EI concepts (IPEC, 2016; Bryan, 2021). The intent of this research is to contribute to the body of knowledge of IPL in healthcare and to promote further study of this critical topic.

Though studies regarding patient safety demonstrate that IPT is vital to quality care outcomes, many IP teams struggle with what IPT looks like and how to do it. These "hows" are primarily due to the soft skills that EI represents but are infrequently studied. Additionally, teamwork is often viewed as a set of tasks that different disciplines are responsible for rather than interdependence of function (Fox et al. 2021; Petit dit Dariel & Cristofalo, 2018). The findings in this study are clinically important for better functioning teams. Empiric research may be lacking but studies like this may garner necessary attention to the importance of EI inclusion in IPE. Additionally, IPT plays a vital role in IPL, and the subscales in the RM domain contribute to this role. Teamwork is in the RM domain, as is conflict management, both attributes of IPL. IPT is often characterized by the actions of specific disciplines rather than the interdependence of making decisions based on the overarching goals of the patient management plan. There must be consensus among the team members on the plan, and IPL is vital to facilitating the conditions for agreement among the IP team.

Several studies prior to this one have established the influence that EI, especially the social domains, has on IPC (Bekkink, Farrell, & Takaesu, 2018; Foronda et al., 2016; Lambert, Vanderbilt, & Papadimos, 2019). Though the measure of IPC in these studies may vary, the premise is the same: good communication practices are essential in IP interaction. Though effective IPC is often cited as a key factor in IP relationships, barriers still exist. Dated professional hierarchies, misunderstanding of roles and educational preparation, mistrust, and cultural differences between specialties are frequently cited as barriers to IPC (Foronda et al., 2016; Payne & Patel, 2014) . It is essential that more studies explore ways to incorporate EI elements into IP training to help break down these barriers and normalize the interpersonal aspects of IPC.

This study has offered data to ponder that, when explored in a larger sample may further support the importance of EI competencies within IPT, IPC, and IPL. The social "soft skills" and

behavioral aspects of optimal IP interactions when studied on a larger basis can contribute to understanding among the IP team and help actualize Future of Nursing and the fourth of the Quadruple Aim - healthcare provider satisfaction (Rathert, Williams, & Linhart, 2018).

Though it is clear that the small sample size precluded finding the statistical significance desired for this study, there is evidence that supports the importance of EI within IPT, IPC, and IPL. The social "soft skills" and behavioral aspects of optimal IP interactions must be studied on a larger basis, to include potential longitudinal investigation of IP groups after IPE that includes EI.

Strengths and Limitations

Conduct of research comes with difficulties, and setbacks can be expected. However, research in the time of Covid restrictions came with its own unique challenges. Limitations on personal meetings were a major factor in communication among the sites, which may in turn have affected participation rates. Competing online priorities and a general upheaval of what constitutes normal activities caused an increased level of stress on students and academicians alike. The survey burden may have been too much for even the most motivated students to overcome.

A major limitation to this study was the small sample size. The original strategy was for the researcher to make a personal presentation regarding the study and the importance of the data to each set of students to encourage participation. Because of the extended time to complete IRB applications in three facilities with different requirements and provisions, the data collection piece was pushed into the height of Covid restrictions. No personal interactions were allowed during this time, therefore the original plan for face-to-face interaction had to be abandoned. The request for participation was limited to email, and the participation emails in at least one University were filtered through a third party that complicated participation, which may not have been as compelling as from the original researcher. In the pilot study at the medical school, the response rate was almost 50%, likely due to the personal interaction of an assistant at the medical school

encouraging participation. Covid restrictions were difficult for everyone, and it is likely that students had competing online and life stressors that deterred participation. Additionally, use of the proprietary instrument ESCI-U was complicated and the deployment of the instrument and accompanying instructions likely diminished participation.

Another potential limitation was that the instruments are all self-reported data. As stated previously, self-reported behavioral data is not as reliable as direct observation. However, in this study, self-perception was what was sought. Though it is true that persons that do not have strong self-awareness may over- or underestimate their actual manifestations of the variables of interest, these measures have acceptable reliability and validity. Limitations on time, money, and personnel inherent in this type of research results in these measures being the best available. The literature demonstrates behavioral factors can be measured by EI testing, and that certain behaviors influence team dynamics and communication. The ESCI-U was developed primarily to measure the behavioral aspects of EI even with self-reported data, accounting for its selection over other available tests which measure EI (Boyatzis & Goleman, 2017). However, the complicated deployment of this instrument likely hindered participation. Though the researcher determined this model would best meet the purpose of this study, the difficulty in the participants' use of this model was not anticipated. Also, since the sample size was too small to complete the originally proposed analysis, it may be that the MEDICC model is incorrect in assumptions about the relationship of these EI behaviors and the predicted influence on IP behaviors. More studies with larger sample sizes are needed.

A limitation for participation was the length of the study questionnaire, the perceived extra work by busy professional students, and the complicated instructions for participation because of the use of a proprietary instrument. Additionally, availability of students and ethical considerations of surveying students is another limitation. Student responses may be influenced by

their perception of survey contents' importance to their education and practice. Perception of importance can also influence whether a participant completes all the surveys or not. There were at least a third of the surveys that were started but not completed for unknown reasons. The survey burden in the main study may have been daunting to busy students. Therefore, the final sample of students was not large enough to determine that the relationships predicted in the MEDICC model are in fact valid. However, of the analysis that was completed, there is evidence that a larger study is warranted.

The biases inherent in self-perception/self-report data collection are noted but as discussed previously, most behavioral analysis is completed with self-reported data because of the time and will be included in the evaluation of the study findings. The biases include potential inaccuracy and participant bias when reporting their own behavior. While there is error inherent in self-perception, whether through implicit bias, selective perception, or fundamental attribution error (Spencer & Brassey, 2017), these instruments serve this study well and are the best instruments currently available.

Strengths of this study are that there were interesting differences between the medical students and APRN students in EI and in how they perceive themselves in IP relationships that bear further examination. It would be compelling to explore these differences in to determine if it is a function of being in a primarily academic-driven setting such as medical school versus a position as a working professional attending school for an advanced degree. The strength of the relationship of the EI variables SA, SM, and SOA to RM was predicted, and further study could elucidate which of these domains and subscales might have the most influence. Empathy is one of the attributes of SOA, and the concept of IP empathy as a contributor to IP collaboration is important to investigate. Since poor IPT has been linked to worse patient outcomes, it is worthwhile to consider investing in EI education to improve IP work.

Recommendations

Recommendations from this study include further research that compares different types of healthcare professionals that are already licensed and practicing in an IP environment. The subjects of interest were students in this study, but it may have been an uneven comparison given that APRN students are already working professionals within IP healthcare and therefore have an established IP identity. This research should be conducted with a much larger sample with participants that are working in IP healthcare teams. Though the sample size was small, there are indications that EI influences the IP competencies of IPT, IPC, and IPC. If we are to educate professionals that can function with common patient outcomes in mind, attention must be paid to IPE that includes training in EI that will facilitate better interpersonal interaction within the IP environment.

Summary

Medical errors cause major patient morbidity and mortality in our current healthcare system despite the attention on patient safety for the last two decades. Lack of communication and misunderstanding of vital patient data have been identified as significant root causes of medical mishap. Healthcare delivery continues to evolve into more complex and decentralized systems, often fragmenting care and providing frequent opportunities for miscommunication. Implementation of checklists and communication tools have failed to stem the tide of medical error. Healthcare is science that is delivered in a web of interpersonal relationships. These interpersonal relationships are influenced by the EI of the participants, whether they are patients, family members, or the diverse set of professionals that interact to deliver care. EI can be enhanced by examining and modifying behavior that affects the IP team dynamics. This research has contributed to the body of knowledge regarding the relationship of EI domains and

competencies to IP interactions, specifically IPT, IPC, and IPL. It is imperative that relationships between teachable aspects of and outcomes on IP teamwork are better understood empirically through high quality research. The result should be that these behavioral soft skills are enhanced by incorporating strategies within IPE and healthcare curriculums nationally.

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Chapter 5: Summary and Conclusions

To first do no harm is an imperative for all healthcare providers. Patient safety is a sacred responsibility that all healthcare personnel share in interprofessional (IP) teams. These IP teams must deliver care in a busy, fragmented, and often decentralized web of interpersonal relationships. Safety programs targeting teamwork and communication often neglect the interpersonal aspects of IP teams. Emotional intelligence (EI) is the essence of interpersonal relations and has been demonstrated be a foundation upon which strong IP teams can be built. For this to happen, EI must be embraced as an essential part of IP education (IPE). Healthcare educators should incorporate principles of EI into IPE wherever possible.

The first manuscript "Using Emotional Intelligence to Enhance Advanced Practice Nursing Competencies" provided a matrix of EI and Advanced Practice Registered Nurses (APRN) competencies for use by nursing educators to help integrate EI into curriculums. It provided suggestions for exercises such as reflective journaling, online clinical conferencing, and online blogging to help students process clinical experiences and enhance EI insights.

The "Meshing Emotional Intelligence Determinants and Interprofessional Collaborative Competencies" (MEDICC) model was introduced in the second manuscript to establish the connection between IP and EI competencies. Using a model such as MEDICC will guide educators in designing high-quality IPE that may include things such as IP simulation, IP integration exercises, and IP reflective practice that incorporates behavioral skills frequently absent from patient safety programs.

The findings in the research study "Impact of Emotional Intelligence on Interprofessional Teamwork, Interprofessional Communication, and Interprofessional Leadership" demonstrated that there is evidence that EI supports IP competencies and should be further investigated. Both the personal and social EI competencies contribute to development of good IP skills in teamwork,

communication, and leadership. Next steps for research would to be replication of this study with a different measure of EI and a much larger population to definitively demonstrate how EI promotes the necessary behavioral skills that enhance IP competencies. In this way future IPE can make substantial strides in promoting healthy integrated IP teams that increase patient safety and optimize outcomes.

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Appendix A
Chapter 2 Tables

Table A1
Emotional Intelligence Competencies*

PERSONAL COMPETENCIES	SOCIAL COMPETENCIES
Self-Awareness	Social Awareness
Emotional self-awareness	*Empathy*
Accurate self-assessment	*Organizational awareness*
Self-confidence	*Service*
Self-Management	Relationship Management
Emotional self-control	*Inspirational leadership*
Transparency	*Influence*
Adaptability	*Developing others*
Achievement	*Change catalyst*
Initiative	*Conflict management*
Optimism	*Building bonds*
	Teamwork & Collaboration

*from Goleman's Framework of Educational Competencies, 2005

Table A2
Advanced Practice Registered Nursing Education Competencies

QSEN Competencies	Essentials of Master's Education in Nursing
Quality Improvement	I. Background for Practice from Science and Humanities
Safety	II. Organizational and Systems Leadership
Teamwork and Collaboration	III. Quality Improvement and Safety
Patient-centered Care	IV. Translating and Integrating Scholarship into Practice
Evidence-Based Practice	V. Informatics and Healthcare Technologies
Informatics	VI. Health Policy and Advocacy
	VII. Interprofessonal Collaboration for Improving Patient and Population Health Outcomes
	VIII. Clinical Prevention and Population Health for Improving Health
	IX. Master's-Level Nursing Practice

Table A3
Leadership, Communication & Teamwork Matrix for APRN and EI Competencies

Leadership	Communication	Teamwork
APRN Competencies: QSEN Patient Centered Care Master's Essential Health Policy and Advocacy EI Competencies: *empathy, emotional self-control, initiative, service*	APRN Competencies: QSEN Quality Improvement, Safety Master's Essentials Quality Improvement and Safety; Health Policy and Advocacy EI Competencies: *empathy, building bonds, conflict management*	APRN Competencies: QSEN Teamwork and Collaboration Master's Essential Organizational and Systems Leadership, Interprofessional Collaboration EI Competencies: *transparency, adaptability, developing others, building bonds, conflict management, emotional self-awareness* and *teamwork & collaboration.*
APRN Competency: Master's Essential Organizational & Systems Leadership EI Competencies: *organizational awareness, influence, change catalyst, influence, inspirational leadership, self-confidence, optimism*	APRN Competencies: QSEN Patient Centered Care, Informatics Master's Essential Informatics and Healthcare Technologies EI Competencies: *transparency, influence, achievement*	APRN Competencies: QSEN Evidence-Based Practice Master's Essential Translating and Integrating Scholarship into Practice EI Competencies: *building bonds, adaptability, achievement*

Appendix B
Chapter 3 Figures

Figure B1
Meshing Emotional intelligence Determinants and Interprofessional Collaborative Competencies (MEDICC) model

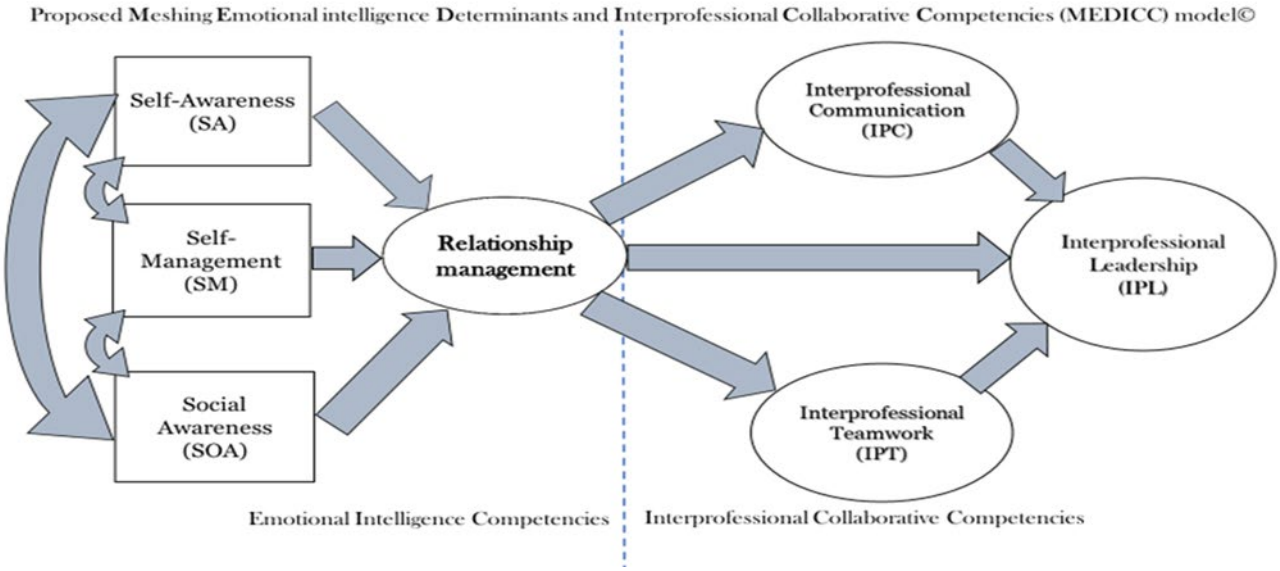
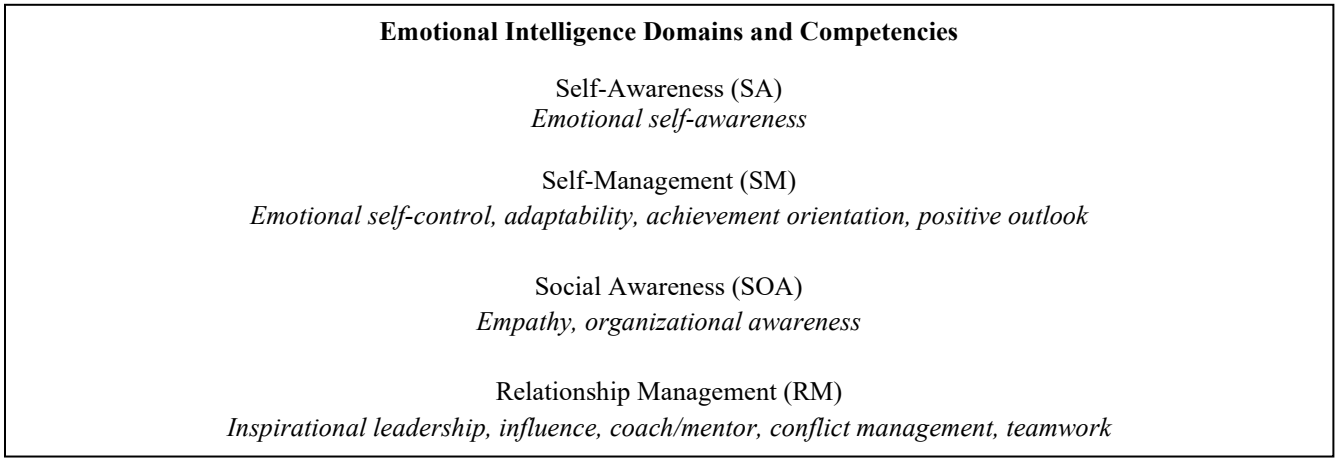


Figure B2
Emotional Intelligence Domains and Competencies

Emotional Intelligence Domains and Competencies



Appendix C
Chapter 4 Tables

Table C1
Personal and Social Emotional Intelligence Competencies

Personal Emotional Intelligence Competencies	
Domain: Self-Awareness (knowing internal states, preferences, resources, intuition) Competency: emotional self-awareness-recognizing one's emotions and their effects	*Domain: Self-Management* (managing internal states, impulses, and resources) Competencies: Emotional self-control- keeping disruptive emotions and impulses in check Adaptability-flexibility in handling change Achievement orientation-striving to improve or meeting a standard of excellence Positive Outlook-seeing the positive aspects of things and the future
Social Emotional Intelligence Competencies	
Domain: Social awareness (how one handles relationships and awareness of others' feelings, needs, & concerns Competencies: Empathy: sensing others' feelings & perspectives, and taking an active interest in their concerns Organizational awareness: reading a group's emotional currents and power relationships	*Domain: Relationship management*-the skill or adeptness at inducing desirable responses in others Competencies: Coach/mentor: sensing other's development needs and bolstering their abilities Inspirational leadership: inspiring and guiding individuals and groups Influence: wielding effective tactics for persuasion Conflict management: negotiating and resolving disagreements Teamwork: working with others toward shared goals

Adapted from 2018 Frontiers in Psychology Boyatzis "The Behavioral Level of Emotional Intelligence and Its Measurement" Aug 2018 Vol 9 Article 1438

Table C2

Conceptual and operational definitions

Concept	Conceptual Definition	Operational definition	Measurement
Self-Awareness (SA)	Recognition of emotions and effects of those emotions on others	Health Care Providers' perceived and observed competence in emotional self-awareness competency	Emotional & Social Competency Inventory (ESCI-U), an instrument measuring frequency of observed behavior for the competency of emotional self-awareness on 5-point Likert Scale (Consistently shown to Never shown)
Self-Management (SM)	Ability to manage one's emotions for reasoning and problem solving	Health Care Providers' perceived and observed competence in emotional self-control, achievement orientation, positive outlook, and adaptability competencies	Emotional & Social Competency Inventory (ESCI-U) an instrument measuring frequency of observed behavior for the competencies emotional self-control, adaptability, achievement orientation, and positive outlook on 5-point Likert Scale (Consistently shown to Never shown)
Social Awareness (SOA)	Ability to understand and manage emotions in others	Health Care Providers' perceived and observed competence in empathy and organizational awareness competencies	Emotional & Social Competency Inventory (ESCI-U) an instrument measuring frequency of observed behavior for the competencies empathy and organizational awareness on 5-point Likert Scale (Consistently shown to Never shown)

Relationship Management (RM)	Ability to induce desirable emotional responses in others	Health Care Providers' perceived and observed competence in influence, coach and mentor, conflict management, inspirational leadership, and teamwork competencies	Emotional & Social Competency Inventory (ESCI-U) an instrument measuring frequency of observed behavior for the competencies coach/mentor, inspirational leadership, influence, conflict management, and teamwork on 5-point Likert Scale (Consistently shown to Never shown)
Leadership (IPL)	Ability of Health Care Providers from different professional backgrounds to provide highest quality and comprehensive care to patients, families, and communities by collaborating effectively across disciplines	Health Care Providers' perceived competence in communication, collaboration, roles and responsibilities, collaborative patient/family centered approach, team functioning, and conflict management	Interprofessional Leadership Inventory (IPLI); A 31-item researcher-adapted inventory assessing self-perceived competency in interprofessional leadership on a 5-point Likert response scale =… 0=not at all; 1=small extent; 2=moderate extent; 3=large extent; 4=great extent (adapted with permission from Interprofessional Collaborator Assessment Rubric [ICAR])
Communication (IPC)	Communicate with other health professionals in a responsive and responsible manner that supports a team approach to the maintenance of health	Health Care Providers' perceived competence in communicating across and within disciplines	Interprofessional Communication Competency Inventory (IPCCI): An 11-item researcher-developed inventory assessing the extent of self-perceived competence

	and treatment of disease		with existing IP communication competencies. Responses are on a 5-point Likert scale, ranging from 0– 4; 0= not at all; 1= small extent, 2= moderate extent, 3=large extent, 4= great extent. The IPCCI was developed using IPEC communication competencies (IPEC, 2016)
Teamwork (IPT)	Apply relationship-building values and the principles of team dynamics to perform effectively in different team roles to plan and deliver patient and population-centered care that is safe, timely effective, and equitable	Health Care Providers' perceived competence in applying teamwork principles across and within disciplines	Interprofessional Teamwork Competency Inventory (IPTCI), an 8-item researcher-developed inventory assessing the extent of self-perceived competence with existing IP teamwork competencies Responses are on a 5-point Likert scale, ranging from 0– 4; 0= not at all; 1= small extent, 2=moderate extent, 3=large extent, 4= great extent. The IPTCI was developed using IPEC communication competencies (IPEC, 2016)

Table C3
Research Questions

1. Does SA, SM, and SOA have a direct effect on relationship management?
2. Does RM have a direct effect on IPT and IPC?
3. Does RM have a direct effect on IPL?
4. Does RM have a mediating effect between SA, SM, and SOA and IPL?
5. Does RM have a mediating effect between SA, SM, and SOA and IPT and IPC?
6. Does IPT and IPC mediate the relationship between RM and IPL?
7. Does RM predict IPC, IPT, and IPL?

Table C4
Pilot Study Demographics

Variable	*n*	*%*
Gender		
Male	23	41
Female	23	41
No response	10	18
Race		
White	26	46.4
Asian	19	33.9
Other	2	3.6
Native Hawaiian or Pacific Islander	1	1.8
No response	8	14.3
Highest level of school that you have completed or highest degree received		
Bachelor's degree	31	55.3
Master's degree	14	25
Professional degree (M.D. or J.D.)	1	1.7
No response	10	18
Are you a medical student, Resident, or Advanced Practice Registered Nursing student (APRN)?		
Medical student or Resident	43	76.7
APRN student	3	5.3
No response	10	18
Do you have another career prior to entering medicalor nursing school?		
Yes	9	16
No	37	66
No response	10	18

Table C5
Pilot Study Reliability Statistics for IPT and IPC Inventories

INVENTORY	CRONBACH ALPHAS	N OF ITEMS
IPTCI	.886	11
IPCCI	.843	8

Table C6
Main Study Demographics

Variable	*n*	*%*
Gender		
Male	5	14.3
Female	17	48.6
No response	13	37.1
Race		
White	11	31.4
Black or African American	3	8.6
Asian	7	20.0
No response	14	40.0
Highest level of school that you have completed or highest degree received		
Bachelor's degree	9	25.7
Master's degree	9	25.7
Professional degree (M.D. or J.D.)	4	11.4
No response	13	37.1
Are you a medical student, Resident, or Advanced Practice Registered Nursing student (APRN)?		
Medical student or Resident	13	37.1
APRN student	9	25.7
No response	13	37.1
Do you have another career prior to entering medicalor nursing school?		
Yes	4	11.4
No	18	51.4
No response	13	37.1

Table C7
Cronbach Alphas for Study Variable Measures

Study Variables	ESCI Subscales	Number of subscales	α
Self-Awareness (SA)	ECSI-U	1	-
Self-Management (SM)	ECSI-U	4	.863
Social Awareness (SOA)	ECSI-U	2	.901
Relationship Management (RM)	ECSI-U	5	.822
Study Variables	IP Measures	Number of items	
Interprofessional Communication (IPC)	IPCCI	11	.942
Interprofessional Teamwork (IPT)	IPTCI	8	.906
Interprofessional Leadership (IPLI)	IPLCI	31	.978

Table C8

Summary Statistics Table for Study Variables

Variable	*n*	Min	Max	*M*	*SD*	Skewness	Kurtosis
Self-Awareness (SA)	25	2.70	5.00	4.08	0.61	-0.59	0.04
Self-Management (SM)	25	3.33	4.88	4.32	0.46	-0.78	-0.21
Social Awareness (SOA)	25	3.05	5.00	4.29	0.52	-0.40	-0.54
Relationship Management (RM)	25	3.16	4.84	4.14	0.44	-0.41	-0.59
Interprofessional Communication (IPC)	22	2.73	5.00	3.85	0.71	0.18	-0.90
Interprofessional Teamwork (IPT)	22	3.00	5.00	4.01	0.69	-0.10	-1.27
Interprofessional Leadership (IPL)	20	2.97	5.00	3.94	0.68	-0.10	-1.14

Table C9

Differences in Study Variables among Sample Subgroups: Medical Students and APRN Students

Variable	Medical Student or Resident			APRN Student			*t*	*df*	*p*
	n	*M*	*SD*	*n*	*M*	*SD*			
Self-Awareness (SA)	4	3.78	0.71	8	4.26	0.73	-1.10	10	.297
Self-Management (SM)	4	3.71	0.59	8	4.43	0.30	-2.89	10	.016*
Social Awareness (SOA)	4	3.69	0.48	8	4.39	0.49	-2.35	10	.041*
Relationship Management (RM)	4	3.65	0.19	8	4.20	0.43	-2.41	10	.037*
Interprofessional Communication (IPC)	13	3.78	0.76	9	3.95	0.67	-0.55	20	.587
Interprofessional Teamwork (IPT)	13	3.85	0.76	9	4.25	0.53	-1.37	20	.185
Interprofessional Leadership (IPL)	12	3.77	0.68	8	4.19	0.63	-1.41	18	.176

*p <.05

Table C10 Correlation Matrix of Study Variables

Variable	SA	SM	SOA	RM	IPT	IPC	IPL
SA	--						
SM	.499*	--					
SOA	.617**	.803**	--				
RM	.565**	.798**	.816**	--			
IPT	.343	.333	.145	.449	--		
IPC	.428	.366	.159	.416	.877**	--	
IPL	.363	.378	.141	.311	.936**	.826**	--

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Table C11

EI Domains Relationship with RM

Variable	*B*	*SE*	β	*t*	*p*
SA	.071	.106	.097	.674	.508
SM	.383	.183	.399	2.096	.048*
SOA	.369	.178	.436	2.077	.050*

Overall model: $F(3, 21) = 18.84$, $p < .001$, $R^2 = .729$

Table C12
RM and IPP Variables Relationships

Relationships	$F(1, 10)$	p	β	t	p	R^2
RM-IPT	2.53	.143	.449	1.590	.143	.202
RM- IPC	2.09	.179	.416	1.446	.179	.173
RM-IPL	.96	.352	.311	.981	.352	.097

Table C13
Relationship Management Mediating Relationships between SA, SM, SOA and IPL (RQ4)

Criterion Variable	Predictor Variable	*B*	*SE*	β	*t*	*p*
IPL	SA	.327	.322	.385	1.016	.343
	SM	1.023	.677	.865	1.510	.175
	SOA	-.918	.674	-.818	-1.362	.215
$F(3, 7) = 1.26$, $p = .358$, $R^2 = .351$						
RM	SA	.071	.106	.097	.674	.508
	SM	.383	.183	.399	2.096	.048*
	SOA	.369	.178	.436	2.077	.050*
$F(3, 21) = 18.84$, $p < .001$, $R^2 = .729$						
IPL	SA	.211	.356	.249	.593	.575
	SM	.967	.695	.818	1.391	.214
	SOA	-1.431	.919	-1.276	-1.557	.171
	RM	.860	1.021	.645	.842	.432
$F(4, 6) = 1.09$, $p = .441$, $R^2 = .420$						

$p<.05$

Table C14

Variance Accounted for by EI Domain Variables SA, SM and SOA in IPL and Variance Added with RM

MODEL	R	R^2	*SE*	R^2 Δ	*F* Δ	*P*
1	.581[a]	.338	.659	.338	1.190	.381
2	.694[b]	.352	.015	.015	1.36	.725

a. Predictors: (Constant), SA, SM, SOA
b. Predictors: (Constant), SA, SM, SOA, RM
c. Dependent variable: IPL

Table C15

RM Mediating SA, SM, SOA and IPT (RQ5)

Criterion Variable	Predictor Variable	*B*	*SE*	β	*t*	*p*
IPT	SA	.303	.308	.385	.985	.353
	SM	.840	.648	.775	1.296	.231
	SOA	-.767	.629	-.771	-1.219	.258
RM	SA	.071	.106	.097	.674	.508
	SM	.383	.183	.399	2.096	.048*
	SOA	.369	.178	.436	2.077	.050*
IPT	SA	.139	.272	.176	.510	.626
	SM	.720	.551	.665	1.306	.233
	SOA	-1.442	.627	-1.449	-2.300	.055
	RM	1.364	.668	1.059	2.042	.080

Overall model: Step 1 - $F(3, 8) = 1.03$, $p = .430$, $R^2 = .279$;
Step 2 - $F(3, 21) = 18.84$, $p < .001$, $R^2 = .729$;
Step 3 - $F(4, 7) = 2.12$, $p = .181$, $R^2 = .548$

Table C16

Variance Accounted for by EI Domain Variables SA, SM, and SOA in IPT and Variance Added with RM

MODEL	R	R^2	*SE*	R^2 Δ	*F* Δ	*P*
1	.505[a]	.255	.700	.255	.915	.476
2	.659[b]	.434	.652	.179	2.212	.181

a. Predictors: (Constant), SA, SM, SOA
b. Predictors: (Constant), SA, SM, SOA, RM
c. Dependent variable: IPT

Table C17
RM Mediating SA, SM, SOA and IPC (RQ5)

Criterion Variable	Predictor Variable	*B*	*SE*	β	*t*	*p*
IPC	SA	.407	.289	.509	1.409	.197
	SM	.927	.608	.843	1.524	.166
	SOA	-.903	.591	-.894	-1.529	.165
$F(3, 8) = 1.66$, $p = .252$, $R^2 = .384$;						
RM	SA	.071	.106	.097	.674	.508
	SM	.383	.183	.399	2.096	.048*
	SOA	.369	.178	.436	2.077	.050*
$F(3, 21) = 18.84$, $p < .001$, $R^2 = .729$						
IPC	SA	.281	.280	.352	1.003	.349
	SM	.835	.567	.759	1.474	.184
	SOA	-1.420	.644	-1.405	-2.204	.063
	RM	1.044	.686	.799	1.521	.172
$F(4, 7) = 2.03$, $p = .195$, $R^2 = .537$						

Table C18

Variance Accounted for by EI Domain Variables SA, SM, and SOA in IPC and Variance Added with RM

MODEL	R	R^2	*SE*	R^2 Δ	*F* Δ	*P*
1	.598[a]	.358	.668	.358	1.486	.290
2	.672[b]	.451	.661	.093	1.193	.311

d. Predictors: (Constant), SA, SM, SOA
e. Predictors: (Constant), SA, SM, SOA, RM
f. Dependent variable: IPC

Table C19
IPC and IPT Mediate RM and IPL (RQ6)

Criterion Variable	Predictor Variable	*B*	*SE*	β	*t*	*p*
IPL	RM	.415	.422	.311	.981	.352
$F(1,9) = 0.96$, $p = .352$, $R^2 = .097$						
IPC	RM	.544	.376	.416	1.446	.179
$F(1, 10) = 2.09$, $p = .179$, $R^2 = .173$						
IPT	RM	.578	.364	.449	1.590	.143
$F(1, 10) = 2.53$, $p = .143$, $R^2 = .202$						
IPL	RM	.034	.387	.025	.088	.932
	IPC	.675	.296	.661	2.279	.052*
$F(2, 8) = 3.30$, $p = .090$, $R^2 = .452$						
IPL	RM	.182	.277	.142	.657	.528
	IPT	.728	.212	.740	3.432	.007*
$F(2, 8) = 11.70$, $p = .004$, $R^2 = .745$						
IPL	IPC	.686	.252	.672	2.72	.023*
$F(1,9) = 7.42$, $p=.02$, R2=.67						
IPL	IPT	.894	.180	.856	4.975	.001
$F(1,9) = 24.75$, $p=.001$, R2=.86						
IPL	IPC	-0.027	.308	-0.026	-0.09	.933
	IPT	.916	.315	.877	2.91	.020*
$F(2, 8) = 11.02$, $p = .005$, $R^2 = .734$						

**p<.05*

Appendix D

Chapter 4 Figures

Figure D1

Emotional intelligence elements that enhance communication & clinical practice

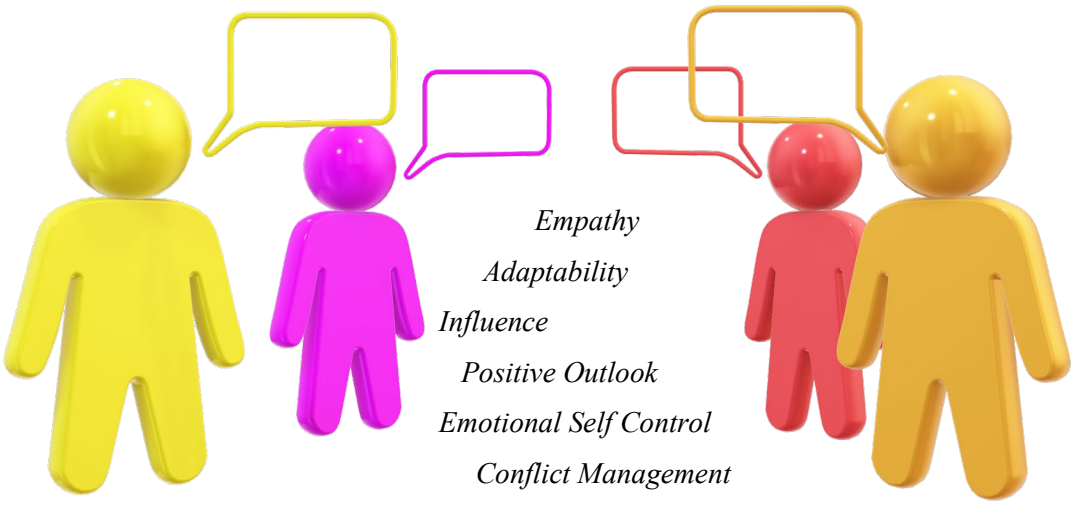


Figure D2

IPEC Framework

Interprofessional Education Framework and Study Model

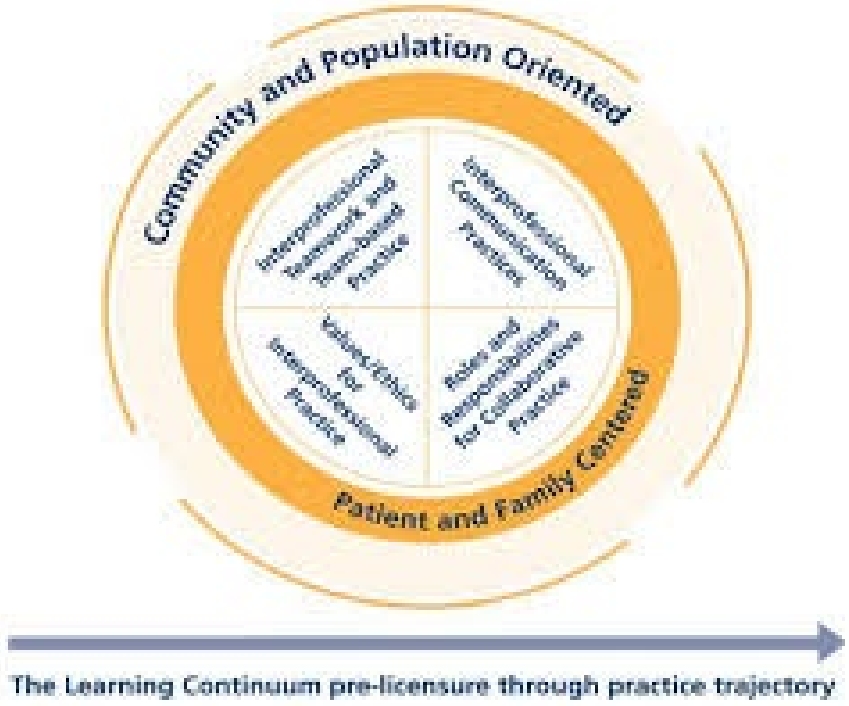
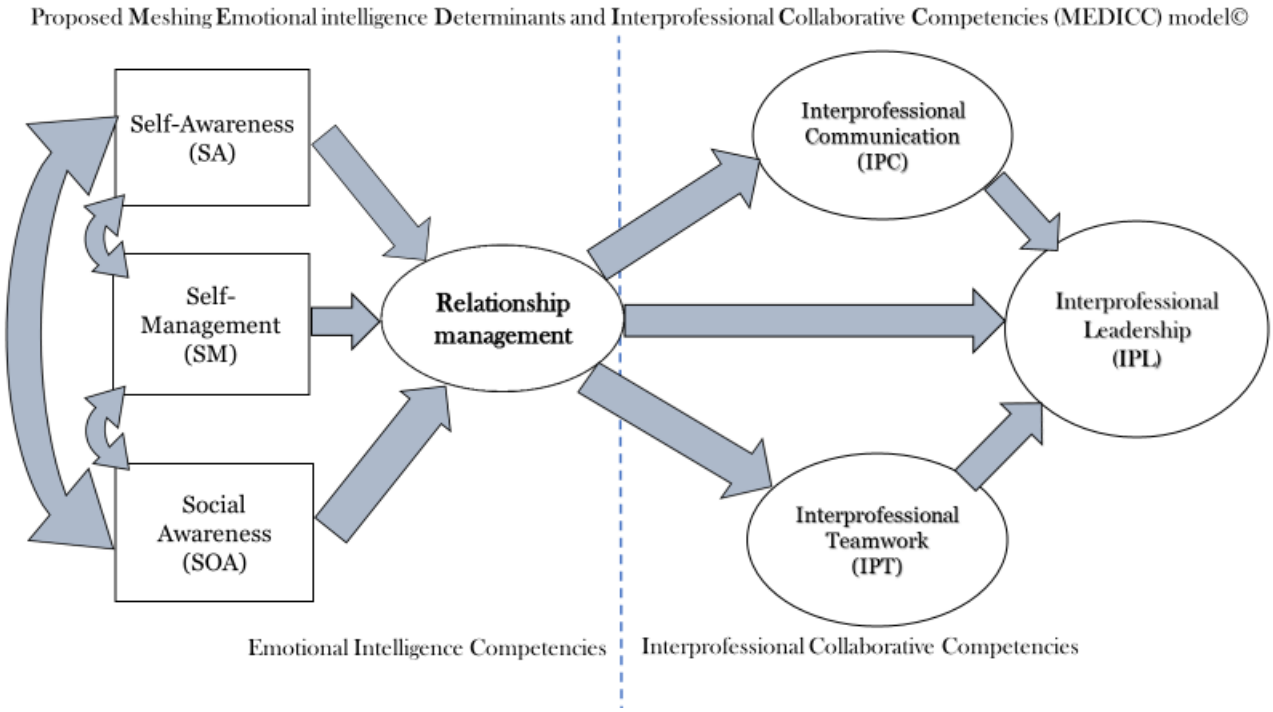


Figure D3

Proposed Meshing Emotional intelligence Determinants and Interprofessional Collaboration Competencies (MEDICC) Model ©



Appendix E

Interprofessional Measures

Appendix E1
Interprofessional Communication and Teamwork Competency Inventory Demographic Questions

Start of Block: Demographics

Q2 What is your year of birth?

_____

Q3 Choose one or more races that you consider yourself to be:

- ☐ White (1)
- ☐ Black or African American (2)
- ☐ American Indian or Alaska Native (3)
- ☐ Asian (4)
- ☐ Native Hawaiian or Pacific Islander (5)
- ☐ Other (6) _____
- ☐ Hispanic or Latino (7)

Q4 Which gender do you identify as?

- ○ Male (1)
- ○ Female (2)
- ○ Prefer not to say (4)

Q5 What is the highest level of school you have completed or the highest degree you have received?

- Less than high school degree (1)
- High school graduate (high school diploma or equivalent including GED) (2)
- Some college but no degree (3)
- Associate degree in college (2-year) (4)
- Bachelor's degree in college (4-year) (5)
- Master's degree (6)
- Doctoral degree (7)
- Professional degree (JD, MD) (8)

Q6 Are you a medical student, Resident, or Advanced Practice Registered Nursing student (APRN)?

- Medical student/Resident (1)
- APRN student (2)

Q7 Did you have another career prior to entering medical or nursing school?

- Yes (1)
- No (2)

End of Block: Demographics

Appendix E2
Interprofessional Teamwork Competency Inventory (IPTCI)

This inventory is to determine your self-perceived ability to apply relationship-building values and team dynamics principles in order to plan and deliver patient and population-centered care that is safe, timely, efficient, effective, and equitable.

Please rank your personal ability on the following statements from "not at all" (0) to "great extent" (4). Please consider each statement independently. The inventory will not accept the same answer on every statement.

The extent to which I consistently:	Not at all	Small extent	Moderate extent	Large extent	Great extent
Can describe the process of team development and the roles and practices of effective teams	0	1	2	3	4
Can develop consensus on the ethical principles to guide all aspects of patient care and teamwork	0	1	2	3	4
Engage other health professionals in shared patient-centered problem-solving appropriate to the specific care situation	0	1	2	3	4
Integrate the knowledge and experience of other professions to inform care decisions while respecting patient and community values and priorities/preferences for care	0	1	2	3	4
Apply leadership practices that support collaborative practice and team effectiveness	0	1	2	3	4
Engage others to constructively manage disagreements about values, roles, goals, and actions that arise among healthcare professionals and with patients and families	0	1	2	3	4
Share accountability with other professions, patients, and communities for outcomes relevant to prevention and health care	0	1	2	3	4
Reflect on my own and team performance for personal and team performance improvement	0	1	2	3	4
Use process improvement strategies to increase the effectiveness of interprofessional teamwork and team-based care	0	1	2	3	4
Use available evidence to inform effective teamwork and team-based practices	0	1	2	3	4
Perform effectively on teams and in different team roles in a variety of settings	0	1	2	3	4

*From "Core Competencies for Interprofessional Collaborative Practice" (2016)

Appendix E3

Interprofessional Communication Competency Inventory (IPCCI)

This inventory is to determine your self-perceived ability to communicate with patients, families, communities, and other health professionals in a responsive and responsible manner that supports a team approach to the maintenance of health and treatment of disease.

Please rank your personal ability on the following statements from "not at all" (0) to "great extent" (4). Please consider each statement independently. The inventory will not accept the same answer on every statement.

The extent to which I consistently:	Not at all	Small extent	Moderate extent	Large extent	Great extent
Choose effective communication tools and techniques, including information systems and communication technologies to facilitate discussions and interactions that enhance team function	0	1	2	3	4
Organize and communicate information with patients, families, and healthcare team members in a form that is understandable, avoiding discipline-specific terminology when possible	0	1	2	3	4
Express my knowledge and opinions to team members involved in patient care with confidence, clarity, and respect, working to ensure common understanding of information and treatment and care decisions	0	1	2	3	4
Listen actively and encourage ideas and opinions of other team members	0	1	2	3	4
Give timely, sensitive, and instructive feedback to others about their performance on the team, responding respectfully as a team member to feedback from others	0	1	2	3	4
Use respectful language appropriate for a given difficult situation, crucial conversation, or interprofessional conflict	0	1	2	3	4
Recognize how my uniqueness, including experience level, expertise, culture, power, and hierarchy within the healthcare tea contributes to effective communication, conflict resolution, and positive interprofessional working relationships	0	1	2	3	4
Communicate the importance of teamwork in patient-centered and community-focused care	0	1	2	3	4

*From "Core Competencies for Interprofessional Collaborative Practice" (2016)

Appendix E4
Interprofessional Leadership Competency Inventory (IPLCI)

Please indicate the extent to which you perceive your leadership within an interprofessional team that is focused on planning and delivery of safe, timely, efficient, effective, and equitable patient and population-centered care. Respond to each statement with the best match for your perspective by choosing one of the options ranging from not at all (0) to great extent (4). Please consider each statement independently. There are no wrong or right answers.

The extent to which I consistently:	**Not at All**	**Small Extent**	**Moderate Extent**	**Large Extent**	**Great Extent**
Facilitate communication with others in a confident, assertive and respectful manner	0	1	2	3	4
Facilitate communication of opinion and pertinent views on patient care with others	0	1	2	3	4
Facilitate responding to requests in a timely manner	0	1	2	3	4
Facilitate communication strategies (verbal & non-verbal) appropriately in a variety of situations	0	1	2	3	4
Facilitate communicate in a logical and structured manner	0	1	2	3	4
Lead in explanation discipline-specific terminology/jargon	0	1	2	3	4
Facilitate strategies that are appropriate for communicating with individuals with impairments (e.g., hearing, cognitive)	0	1	2	3	4
The extent to which I consistently:	**Not at All**	**Small Extent**	**Moderate Extent**	**Large Extent**	**Great Extent**
Lead in establishing collaborative relationships with others	0	1	2	3	4
Lead in integration of information and perspectives from others in planning and providing patient/client care	0	1	2	3	4
Leads in sharing information with other providers that is useful for the delivery of patient/client care	0	1	2	3	4
Facilitate approval of the patient/client or designated decision-maker when information is shared	0	1	2	3	4
The extent to which I consistently:	**Not at All**	**Small Extent**	**Moderate Extent**	**Large Extent**	**Great Extent**
Describe my own roles and responsibilities in a clear manner with the team/patient/family	0	1	2	3	4
Promote and include the roles and responsibilities of all necessary health providers to optimize collaborative patient/client care	0	1	2	3	4
Demonstrate professional judgment when assuming tasks or delegating tasks	0	1	2	3	4
Accept responsibility for the failure of collaborative goals	0	1	2	3	4
Accept responsibility for individual actions that impact the team	0	1	2	3	4

Explain my scope of practice, code of ethics, standards and/or clinical guidelines in relation to collaborative patient-centered relationship	0	1	2	3	4
Share evidence-based or best practice discipline specific knowledge with others	0	1	2	3	4
The extent to which I consistently:	**Not at All**	**Small Extent**	**Moderate Extent**	**Large Extent**	**Great Extent**
Seek input from patient/ client and family	0	1	2	3	4
Promote and integrate patient's/ client's and family's circumstances, beliefs and values into care plans	0	1	2	3	4
Share options and health care information with patients/clients and families	0	1	2	3	4
Advocate for patient/client and family as partners in decision-making processes	0	1	2	3	4
The extent to which I consistently:	**Not at All**	**Small Extent**	**Moderate Extent**	**Large Extent**	**Great Extent**
Demonstrate recognition of the relationship between team functioning and quality of care	0	1	2	3	4
Demonstrate recognition of strategies that will improve team functioning	0	1	2	3	4
Share leadership and alternate leadership with others when appropriate for the discipline involved	0	1	2	3	4
Demonstrate recognition of myself as part of a team	0	1	2	3	4
Contribute to interprofessional team discussions	0	1	2	3	4
The extent to which I consistently:	**Not at All**	**Small Extent**	**Moderate Extent**	**Large Extent**	**Great Extent**
Seek the perspectives and opinions of others	0	1	2	3	4
Seek clarification in a respectful manner when misunderstandings arise	0	1	2	3	4
Use active listening when others are speaking	0	1	2	3	4
Use appropriate conflict resolution strategies to manage and/or resolve conflict	0	1	2	3	4

Appendix F

Sample Recruitment Emails

Appendix F1

Sample Participant Email (Pilot Study)

Dear Participant,

The purpose of this study is to determine reliability and internal consistency for a survey regarding interprofessional teamwork and interprofessional communication.

You have been asked to complete these surveys because you have been identified as a member in the group of interest (either a medical student or advanced practice nursing student.)

If you decide to participate in this anonymous survey, the survey will take less than 15 minutes to complete.

If you agree to take part in this survey, the research team will analyze the anonymous data for reliability.

This research may help to facilitate understanding of professional views regarding interprofessional teamwork and communication.

There are no known or anticipated risks or discomforts associated with participation.

There are no direct costs to participation and there will be no compensation. There is the offer to participate in a drawing for prize for completion of the surveys.

Taking part in this survey is voluntary. You have the right to choose not to take part in this study. If you do not take part in the study, there will be no penalty or loss of benefit. If you choose to take part, you have the right to skip any questions or stop at any time.

If you have questions or concerns about your participation as a survey participant, please contact the Principal Investigator Kathleen Cox at (915-747-6491) or email kmcox@utep.edu.

The results of this survey may be presented at meetings or in publications; however, your name and/or personal information will not be disclosed in those presentations.

All surveys will be anonymous and data will be contained on a password-protected computer.

Authorization Statement

I have read each page of this paper about the survey. I know I can stop this survey without penalty. I know that participating in this survey is voluntary.

Please feel free to print a copy for your records.

I agree to participate by completing this survey.

LINK TO SURVEY:

Thank you for your participation!

Appendix F2

Sample Participant Email (Main Study)

Dear Participant,

The purpose of this study is to explore the relationships of emotional intelligence to interprofessional teamwork, interprofessional communication, and interprofessional leadership.

You have been asked to complete these surveys because you have been identified as a member in the group of interest (either a medical student or advanced practice nursing student.)

If you decide to participate in this anonymous survey, the emotional intelligence survey will take about 20 minutes to complete. The three interprofessional surveys will take no more than 10-15 minutes to complete each. The code assigned to you by the ESCI-U will be the same code you will insert into Question #1 of the second survey.

If you agree to take part in this survey, the research team will analyze the anonymous data for relationships between emotional intelligence and the interprofessional measures described above. Discovery of these relationships may be the topic of a future publication.

This research may help us to understand how emotional intelligence does or does not affect interprofessional competencies of interest.

There are no known or anticipated risks or discomforts associated with participation.

There are no direct costs to participation and there will be no compensation. There is the offer to participate in a drawing for prizes for completion of the surveys.

Taking part in this survey is voluntary. You have the right to choose not to take part in this study. If you do not take part in the study, there will be no penalty or loss of benefit. If you choose to take part, you have the right to skip any questions or stop at any time.

If you have questions or concerns about your participation as a survey participant, please contact the Principal Investigator Kathleen Cox at (915-747-6491) or email kmcox@utep.edu.

The results of this survey may be presented at meetings or in publications; however, your name and/or personal information will not be disclosed in those presentations.

All surveys will be anonymous and data will be contained on a password-protected computer.

Authorization Statement

I have read each page of this paper about the survey. I know I can stop this survey without penalty. I know that participating in this survey is voluntary.

Please feel free to print a copy for your records.

I agree to participate by completing this survey.

LINK TO SURVEY:

Thank you for your participation!

Appendix G
IRB Approvals

Appendix G1 University of Texas at El Paso IRB Approval

Institutional Review Board

Office of the Vice President for Research and Sponsored Projects
The University of Texas at El Paso IRB
FWA No: 00001224
El Paso, Texas 79968-0587
P: 915-747-7693 E: irb.orsp@utep.edu

Date:	October 13, 2020
To:	Kathleen Cox, PhD(c), DNP
From:	University of Texas at El Paso IRB
Study Title:	[1622373-1] Impact of Emotional Intelligence on Interprofessional Teamwork, Interprofessional Communication, and Interprofessional Leadership (The EI-TCL Study)
IRB Reference #:	School of Nursing
Submission Type:	New Project
Action:	APPROVED
Review Type:	Expedited Review
Approval Date:	October 13, 2020
Expiration Date:	October 12, 2022

Please be advised, the University of Texas at El Paso, in alignment with state and federal guidelines, has placed temporary restrictions on in-person human subject research. This includes initiating recruitment, enrollment, and all in-person research activities. Please monitor university correspondence as these guidelines are subject to change as the situation evolves.

The University of Texas at El Paso IRB has approved your submission. This approval is based on the appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This study has received Expedited Review based on the applicable federal regulation.

Based on the risks, this project requires Biennial Verification by this office on an biennial basis. Please use the appropriate renewal forms for this procedure. The renewal request application must be submitted, reviewed and approved, before the expiration date.

Reminder: No face-to-face human subject's research is allowed until COVID-19 restrictions are lifted and/or a work-safety plan approved by your Chair, Dean, and VPR is obtained. Research at external institutions/site(s) may require a recently dated letter of support/collaboration.

This approval does not replace any departmental or other approvals that may be required. Other institutional clearances and approvals may be required. Accordingly, the project should not begin until all required approvals have been obtained.

Please note that you must conduct your study exactly as it was approved by the IRB. Any revision to previously approved materials must be approved by this office prior to initiation, except when necessary to eliminate apparent immediate hazards to the subject.

All serious and unexpected adverse events must be reported to this office. Please use the appropriate adverse event forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

Please report all Non-Compliance issues or Complaints regarding this study to this office.

Remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

Upon completion of the research study, a Closure Report must be submitted the IRB office.

You should retain a copy of this letter and any associated approved study documents for your records.

All research records must be retained for a minimum of three years after termination of the project. The IRB may review or audit your project at random or for cause. In accordance with federal regulation (45CFR46.113), the board may suspend or terminate your project if your project has not been conducted as approved or if other difficulties are detected.

If you have any questions, please contact the IRB Office at irb.orsp@utep.edu or Bernice Caad at (915) 747-6590 or by email at bcaad@utep.edu. Please include your study title and reference number in all correspondence with this office.

Sincerely,

Dr. Lorraine Torres, Ed.D, MT(ASCP)
IRB Chair

Appendix G2
Texas Tech University IRB Approval

TEXAS TECH UNIVERSITY
HEALTH SCIENCES CENTER
EL PASO

INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN SUBJECTS
FWA # 00020736 EL PASO IRB #00009945

EXEMPT FROM FORMAL IRB REVIEW

January 08, 2021

IRB#: E21034

STUDY TITLE: Impact of Emotional Intelligence on Interprofessional Teamwork, Interprofessional Communication, and Interprofessional Leadership (The EI-TCL Study) (EI-TCL Study)

PRINCIPAL INVESTIGATOR: Neha Sehgal

SUBMISSION REFERENCE #: 077053

TYPE OF REVIEW: EXPEDITED

DATE CLASSIFIED AS EXEMPT: 01/08/2021

APPLICABLE FEDERAL REGULATION: 45 CFR 46.104(d)(2)(iii)

HIPAA WAIVER OF AUTHORIZATION APPROVED: NO

DATA USE AGREEMENT FOR LIMITED DATASET NEEDED: NO

Update Description: The primary aim of this cross-sectional study is to explore the relationships among the four domains of emotional intelligence – self-awareness (SA), self-management (SM), social awareness (SOA), and relationship management (RM) within the inter-professional (IP) healthcare community, particularly focusing on medical students and advanced practice nursing students. The study is comprised of two phases. Phase 1 is a pilot study to determine the internal consistency and reliability of the researcher-developed Inter-professional Teamwork & Communication Competency Inventories. It will involve PLFSOM third year medical students. Phase 2 is testing of the study model MEDICC and collecting data regarding the four domains of EI. It will involve PLFSOM fourth year medical students. Both phases will involve a voluntary online study questionnaire that will be administered electronically and confidentially. Data analysis will focus on the strength, direction, and magnitude of the relationship between the domains. We believe the study findings will provide healthcare educators valuable insight on how to create programs that are grounded in positive IP behavior that reduce IP miscommunication and errors in healthcare delivery.

Recommendations: 1. The IRB acknowledges that this project meets the criteria for exemption from formal IRB review in accordance with 45 CFR 46.104 category (d)(2)(iii): The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the required by .111(a)(7). A waiver of documentation of signed consent has been approved per 46.117(c)(2).

Research Personnel Approved:
Neha Sehgal
Ricardo Parra, MD
Servando Rivera, MD
Danielle Austin
Susan Watts, PhD

Documents reviewed and acknowledged include:
1) Study Application - (Version 1.3)
2) Letter of support - Office of Student Affairs (Version: 10/13/2020)
3) Letter_of_support___Office_of_Student_Affairs (Version: 10/27/2020)
4) IPE_TTx IRB Stipulation (Version: 11/25/2020)
5) UTEP IRB Approval Letter (Version: 10/23/2020)
6) UTEP_IRB_Approval_Letter (Version: 10/27/2020)
7) CoxK_Proposal FINALv2 (Version: 10/07/2020)
8) IP_Recruitment_Email v2 (Version: 10/07/2020)
9) IP_Communication_Pilot (Version: 09/22/2020)
10) IP_Leadership_Phase2 (Version: 09/22/2020)
11) IP_Teamwork_Pilot (Version: 09/22/2020)

This application was screened for exempt status according to TTUHSC El Paso policies and the provisions of applicable federal regulations. The study was found not to require formal IRB review because the research falls into one of the categories specifically designated as exempt per 45CFR46.104.

Do not use any subject names or identifiers when presenting or publishing the study results.

There is no expiration date for studies which have been classified as Exempt from formal IRB review.

This exemption covers Texas Tech University Health Sciences Center El Paso, 4800 Alberta Avenue, El Paso, Texas, 79905, University Medical Center of El Paso, 4815 Alameda Avenue, El Paso, Texas, 79905, and El Paso Children's Hospital, 4845 Alameda Ave, El Paso, Texas, 79905, as applicable.

If the research involves a review of TTUHSC El Paso medical records (paper or electronic), please submit an electronic copy of this approval letter, the study application [with HIPAA Waiver] and data collection sheet to designated individuals, for approval. **For projects that will be using Redcap, please submit the final version of the Redcap data collection sheet, through an amendment, for documentation.**

University Medical Center of El Paso/El Paso Children's Hospital:
If the study will take place at an El Paso County Hospital District Facility (EPCHD; University Medical Center of El Paso or a Thomason CAREs clinic)/El Paso Children's Hospital (EPCH) or if the study will utilize EPCHD/EPCH resources for research purposes (i.e., medical records, lab, radiology, etc.), please contact Dani Joyner for information on the Research Compliance approval process (DJoyner@umcelpaso.org or 544-1200 ext. 80503). **The affiliate approval letter must be received by the investigators *prior to* initiation of research at this setting.**

Consent Form (*if applicable*): N/A

Documentation of informed consent is waived per (c)(1)(ii): That the research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside of the research context.

Reporting: Modifications to this research proposal must be submitted to and **approved** by the IRB **prior to the implementation** of the modification. You must report to the IRB any serious problem, adverse effect, or outcome that occurs in conjunction with this project. You are also required to notify the IRB when this study is completed.

Regulatory Compliance Audits: TTUHSC El Paso IRBs are authorized to monitor research involving human subjects approved by the IRB pursuant to the responsibilities and assurances made by TTUHSC El Paso under federal regulations (FWA 00020736) and TTUHSC El Paso Policy (TTUHSC EP OP 73.06 Research

Involving Human Subjects and TTUHSC EP OP 73.14 Research Compliance).

The Office of Research Resources shall be responsible for compliance activities on behalf of the IRB and VPR, including audits and monitoring of IRB approved research. For additional information, refer to the Human Research Protection Program Manual.

Please retain this letter with your research records. Research records include all Institutional Review Board submissions and responses and must be kept in the principal investigator's file for a minimum of three (3) years after completion of the study. ***Research records, including data and specimens, are the property of TTUHSC El Paso and shall not be transferred to another entity without prior approval of the Vice President for Research.***

STATEMENT OF COMPLIANCE

The Texas Tech University Health Sciences Center El Paso Institutional Review Board (TTUHSC El Paso IRB) is duly constituted (fulfilling FDA requirements for diversity), allows only those IRB members who are independent of the investigator and sponsor of the study to vote/provide opinion on the study, has written procedures for initial and continuing review, prepares written minutes of convened meetings, and retains records pertaining to the review and approval process; all in compliance with requirements defined in 21 CFR (Code of Federal Regulations) Parts 50 and 56, and ICH (International Conference on Harmonization) guidance relating to GCP's (Good Clinical Practice). The TTUHSC El Paso IRB is registered with OHRP/FDA; our parent organization number is IORG0008299 and our registration number is 00009945.

The TTUHSC El Paso IRB is guided by ethical principles applicable to all research involving humans as subjects, as set forth in the report of the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (known as the Belmont Report). The IRB's primary responsibility is to protect the privacy, safety and welfare of the human subject participating in research.

The TTUHSC El Paso IRB Policies and Procedures are available for reference on the TTUHSC El Paso Human Research Protection Program Website:
(http://www.elpaso.ttuhsc.edu/research/committees/irb/resources/default.aspx).

TTUHSC El Paso Institutional Review Board
5001 El Paso Drive, Room 2002
El Paso, TX 79905
Telephone: 915-215-4590

Appendix G3
University of Texas at Tyler IRB Approval

Date: 10-17-2021

IRB #: IRB-FY2020-58
Title: Impact of Emotional Intelligence on Interprofessional Teamwork, Interprofessional Communication, and Interprofessional Leadership (The EI-TCL Study)
Creation Date: 3-31-2020
End Date:
Status: Approved
Principal Investigator: Kathleen Cox
Review Board: UT Tyler Board - FY21
Sponsor:

Study History

Submission Type Initial	**Review Type** Expedited	**Decision** Rely on External IRB

Key Study Contacts

Member Ellen Fineout-Overholt	**Role** Co-Principal Investigator	**Contact** lfineout@uttyler.edu
Member Ellen Fineout-Overholt	**Role** Investigator	**Contact** lfineout@uttyler.edu
Member Kathleen Cox	**Role** Principal Investigator	**Contact** kcox11@patriots.uttyler.edu
Member Kathleen Cox	**Role** Primary Contact	**Contact** kcox11@patriots.uttyler.edu

Permission from Journal of Nursing Education for Inclusion of Published Article

Acceptable uses of SLACK Incorporated journal articles that are not published open access are outlined in the chart below:

SCHOLARLY USES OF NON-OPEN ACCESS JOURNAL ARTICLES

Scholarly Use	Abstract, Link to Article on Healio.com, and Citation	Author's Accepted Version	Final Publisher Version
Author's personal, noncommerical website or blog	Yes	Yes, 12 months following publication	No
Author's promotion/tenure packet	Yes	Yes	Yes
Sharing with colleagues on request for their personal use	Yes	Yes	Yes, up to 25 copies and **NOT** including distribution to large email lists or list servers
Teaching/training at the author's institution	Yes	Yes	Yes, as long as reasonable measures taken not to allow open sharing on the internet
Conferences (oral presentation, display, and/or photocopies)	Yes	Yes	Yes, up to 25 copies (contact the editorial office if more copies are needed)
★Dissertations, theses, or grant applications	Yes	Yes	Yes, with the exception of open access theses/ dissertations
Institutional repository (private, closed)	Yes	Yes	No
Institutional repository (open access)	Yes	Yes, 12 months following publication	No
Funding repository	Yes	Yes, 12 months following publication	No
Scholarly collaboration networks (eg, ResearchGate, Academia.edu)	Yes	Yes, 12 months following publication	No
Social media	Yes	No	No
Commercial purposes	Contact the publisher	Contact the publisher	Contact the publisher

*Inclusion in Dissertation is expressly permitted without further permission

BIOGRAPHICAL SKETCH

NAME: Kathleen M. Cox

EMAIL: kcox11@patriots.uttyler.edu; drkcoxacnp@gmail.com

POSITION TITLE: PhD

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date MM/YYYY	FIELD OF STUDY
University of Texas at Tyler (UTT)	PhD	10/2021	Nursing
University of Maryland Baltimore (UMB)	MSN	5/2014	Nursing
University of Maryland Baltimore (UMB)	Post-grad certification	5/2007	Nursing
University of Texas at El Paso (UTEP)	BSN	12/1991	Nursing

A. Personal Statement

I have always had an interest in the various behavioral aspects of healthcare, though my evolution in healthcare has taken an interesting route. My first foray into higher education was as a psychiatric specialist student. Because of a lack of funds, I joined the military as a medic and realized I wanted to be a part of military medicine as a nurse. Despite setbacks and financial hardship, I was able to complete a BSN with multiple scholarships and grants and took a direct commission into the Army as an Army Nurse Corps Officer.

Deployment as a 2nd Lieutenant RN in the 46th CSH in Somalia during the infamous "Black Hawk Down" incident solidified my desire to become a nursing leader and to explore behavioral aspects of healthcare because of the moral distress and emotional trauma many suffered there. While working as an ICU nurse at Walter Reed Army Medical Center, I attained a Master's degree in Nursing in Trauma and Acute Care Nurse Practitioner (ACNP-BC) and a post-graduate certification in Teaching in Nursing and Health Sciences. I was then employed full time as an Advanced Practice Registered Nurse (APRN), publishing an article on moral distress and maintaining moral integrity in nursing.

While I accomplished my Doctor of Nursing Practice (DNP), I was working as an Acute Care Nurse Practitioner (ACNP) in Surgical Services at William Beaumont Army Medical Center. My scientific DNP work focused on cognitive outcomes of patients that suffer delirium in the ICU and healthcare interventions that help identify delirium and mitigate poor outcomes. I was also employed part time as an educator in an Adult Gerontology Acute Care Nurse Practitioner (AGACNP) program at the University of Texas at El Paso (UTEP), eventually becoming the Director. My scientific work then expanded to experiential learning, and I did some work in debriefing in simulation for optimization of learning outcomes. It was at this time that I began reading and researching emotional intelligence as a way to quantify nursing's unique contribution to healthcare. This led to my current interest and research in improving interprofessional healthcare team performance through attention to behavioral aspects of team dynamics.

B. Positions, Scientific Appointments, and Honors

Director, Adult Gerontology Acute Care Nurse Practitioner Program, University of Texas at El Paso (UTEP), 2015-2021.

Fellow of the American Association of Nurse Practitioners (FAANP), June 2020.

Certified Nurse Educator (CNE), 2019-present.

Advanced Practice Registered Nurse-Certified Nurse Practitioner (APRN-CNP). Comprehensive Varicose Veins Laser Clinic, Las Cruces, NM, 2015-2021.

Acute Care Nurse Practitioner for General Surgery & Vascular Surgery Services. William Beaumont Army Medical Center, El Paso, TX, 2009-2015.

Acute Care Nurse Practitioner, Board Certified (ACNP-BC) 2008- present.

Certified Critical Care Nurse Specialist (CCNS), 2008-2017.

TeamSTEPPS Master Trainer certification 2012.

Advanced Practice Nurse for Acute Care Services, Sinai Hospital of Baltimore, Baltimore, MD, 2007-2008.

C. Contributions to Science

American Association of Nurse Practitioners (AANP) Annual Conference 2019 Podium Presentation: *Delirium in Acute Care: Do We Know It When We See It*?

American Association of Colleges of Nursing (AACN) Masters Education Conference 2019 Poster Presentation: *Teaching Strategies Linking Emotional Intelligence to APRN Competencies*

Cox, K.M. (2018). Use of emotional intelligence to enhance advanced practice registered nursing competencies. *Journal of Nursing Education*, 57(11), 648-654.

Texas Nurse Practitioners (TNP) Association 2018 Annual Conference Podium Presentation: *Delirium in Acute Care: What Can We Do?*

National Organization for Nurse Practitioner Faculty (NONPF) 2016 Annual Conference Poster Presentation: *Evaluating the Impact of Structured Debriefing on APN Student Perception of Learning*

13th International Sun Conference on Teaching and Learning Podium Presentation 2016: *Best Practices in Experiential Learning: How To's of Structured Debriefing Sessions*

American Delirium Society (ADS) 4th Annual Meeting 2014 Poster Presentation: *Implementation and Evaluation of a Daily Delirium Screening in the Intensive Care Unit*.

Cox, K.M. (2008). Moral distress: Strategies for maintaining moral integrity. *Perioperative Nursing Clinics*, 3(3), 197-203.