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Understanding Emotional Intelligence and Its Relationship to Clinical Reasoning in Nursing Students: A Mixed Methods Study

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UNDERSTANDING EMOTIONAL INTELLIGENCE AND ITS RELATIONSHIP TO

CLINICAL REASONING IN NURSING STUDENTS: A MIXED METHODS STUDY

BY

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This dissertation is approved as a creditable and independent investigation by a

candidate for the Doctor of Philosophy degree and is acceptable for meeting the

dissertation requirements for this degree. Acceptance of this does not imply that the

conclusions reached by the candidate are necessarily the conclusions of the major

department.

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I would like to dedicate this dissertation to my family. To my daughters, Paige, Claire, and Sophie, who have done nothing but encourage me throughout this entire process. All three of you have been instrumental in my success and I thank you for granting me the time and grace during this busy time of our lives. I hope that I have instilled in you a passion for lifelong learning and the mentality that you can achieve whatever goals you set for yourselves. I will be there for you as you have been there for me. To Mitch, your support made it possible for me throughout this journey. To my parents, Les and Diane Pettis, who have truly provided for me and my family in so many ways. I am forever grateful for the fire you lit in me for learning as a young child and providing the opportunities that started me on this path to my PhD. And to my brother Matt and sister-in-law Christy, thank you for your answering so many statistics questions and reading drafts. I am so grateful to have all of you in my life.

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ABBREVIATIONS

BSN	Bachelor of Science in Nursing
EI	Emotional Intelligence
HSRT	Health Sciences Reasoning Test
M	Mean
MSCEIT	Mayer-Salovey-Caruso Emotional Intelligence Test
N	Total Sample
n	Subsample
p	Significance Level
PNBS	Positive Negative Bias Score
r_s	Spearman's rho
SD	Standard Deviation
W	Shapiro-Wilk Test Value

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ABSTRACT

UNDERSTANDING EMOTIONAL INTELLIGENCE AND ITS RELATIONSHIP TO

CLINICAL REASONING IN NURSING STUDENTS: A MIXED METHODS STUDY

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Purpose. The purpose of this study was to explore emotional intelligence (EI) and its relationship to clinical reasoning in senior bachelor of science in nursing (BSN) students to gain a better understanding of how emotions are used in clinical learning experiences. This study was guided by the Four Branch Ability Model of EI.

Background. The current complex healthcare environment requires nursing students to be prepared to effectively reason in emotionally charged situations. The concept of EI and its beneficial effects in nursing are becoming more evident in the literature. However, it is still not well understood what the EI abilities are of nursing students and how EI competencies should be integrated in nursing education. In order to prepare safe and effective nurses, a foundational first step is to understand the EI of nursing students and how emotions are used in clinical learning experiences.

Methods. This study utilized a convergent parallel mixed methods design. The quantitative strand consisted of two validated instruments, the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) and the Health Sciences Reasoning Test (HSRT). The qualitative strand consisted of two open-ended questions.

Results. The participants were 16 senior BSN students from a university in the Midwest region of the United States. Quantitative findings indicated a positive relationship between *Strategic EI* area and the clinical reasoning scale of *inference* (r_s = .489, p =

.044). A positive relationship was also found between the *Understanding Emotions* branch and overall clinical reasoning ($r_s = .559$, $p = .024$) and its scale of *induction* ($r_s = .530$, $p = .035$). A descriptive content analysis was completed to analyze the qualitative data, which resulted in three categories: (1) Sadness for…, (2) Shifting Emotions, and (3) Presence.

Conclusion. This study indicates a relationship between aspects of EI and clinical reasoning in senior BSN students. It also provides valuable insight on emotions and their use in clinical learning experiences. This new knowledge will assist nurse educators to become more aware of EI in clinical learning experiences and inform further investigation of teaching and learning practices focused on EI and its development.

Chapter 1: Introduction

"Let's not forget that the little emotions are the great captains of our lives and we obey them without realizing it." – Vincent Van Gogh, 1889

Nursing is a highly emotional profession that involves caring for vulnerable patients and their families. The care environment has become extremely complex due to higher patient needs and continuous communication and interaction with a multitude of interprofessional team members (Institute of Medicine [IOM]), 2011). Within these complex care environments, many different types of emotions are present in nurses, patients, and interprofessional team members. The provision of safe and effective patient care requires nurses to be able to effectively reason and make decisions in emotionally charged environments (Kozlowski, Hutchinson, Hurley, Rowley, & Sutherland, 2017). Preparing nurses to provide safe and effective care begins with classroom and clinical learning experiences. Nursing education programs are faced not only with developing students' reasoning and technical skills to practice safely in a highly advanced technological environment but fostering their emotional abilities as well (Smith, 2017).

Nursing education programs have focused on the development and assessment of clinical reasoning skills for over 30 years (Lasater, 2011). Sharp clinical reasoning skills are necessary for the provision of safe patient care because of the direct relationship these skills have to the prevention of adverse patient outcomes (Aiken, Clarke, Cheung, Sloane, & Silber, 2003; Benner, Sutphen, Leonard, & Day, 2010; Theisen & Sandau, 2013). With the healthcare environment continuing to evolve in complexity, sound clinical reasoning is a critical skill for nursing students to continue to develop (Deschenes, Charlin, Gagnon, & Goudreau, 2011; Theisen & Sandau, 2013). Clinical reasoning is a

term that is often used interchangeably with critical thinking, clinical judgment, and decision making (Simmons, 2010; Tanner, 2006). Clinical reasoning uses metacognition (reflection of one's thinking and learning) in addition to cognition (thinking) and discipline specific knowledge to come to a decision (Simmons, 2010). Clinical learning experiences serve as the primary experiential pedagogy to develop clinical reasoning skills and provide for a deeper understanding of the discipline of nursing (Benner et al., 2010; Tanner, 2006). However, new graduates are deficient in clinical reasoning skills and not well prepared to safely care for patients (Berman et al., 2014; Del Bueno, 2005; Fero et al., 2010; Hayden, Smiley, & Gross, 2014; Thiesen & Sandau, 2013). A lack of deep learning in academic nursing programs in addition to the increased complexity of the healthcare system leaves a significant competency gap with new nurses being underprepared for professional practice (Kavanah & Szweda, 2017).

Clinical reasoning is a complex cognitive process that involves many elements and little, if any, attention has been given to the role of emotions in this process. Emotional intelligence (EI) has emerged as a critical concept with significant implications for professional nurses during the stressful and challenging situations associated with healthcare. EI is the ability to engage in information processing about one's own and other's emotions and to use this information to guide thinking and action (Mayer, Salovey, & Caruso, 2008). Critical thinking creates a vital connection between intelligence and emotion, determining the quality of EI (Elder, 1997). Nurses must effectively manage their emotional responses as well as the emotional responses of others to safely practice in these complex care environments (Foster, McLoughen, Delgado, Kefalas, & Harkness, 2015; Freshwater & Stickley, 2004).

Making decisions in emotionally charged environments requires strong EI abilities as emotions drive judgment and decision-making processes (Kozlowski et al., 2017). The ability to balance the rational and emotional mind is required for every clinical nursing intervention (Akerjordet & Severinsson, 2007). While research on EI and its relationship to clinical nursing interventions is limited, preliminary evidence relates the importance of EI to safe and effective quality care outcomes for patients (Adams & Iseler, 2014; Codier, Kamikawa, Kooker, & Shoultz, 2009; Kooker, Shoultz, & Codier, 2007). These preliminary findings fuel the need to foster EI in nurses and nursing students. Little is known about EI and its significance in nursing education (Smith, 2016). More so, even though clinical reasoning concepts are foundational to the definition of EI, there appears to be no information on the relationship between the two. A deeper understanding of EI and its relationship to clinical reasoning in nursing students is necessary to further the development of safe and effective nurses.

Background and Significance

Many skills associated with EI competencies set students up for successful integration into nursing practice (Rochester, Kilstoff, & Scott, 2005). However, it is still not well understood what the EI abilities are of nursing students and how EI competencies should be integrated into nursing education and learning experiences. The majority of evidence related to EI in nurses and nursing students is quantitative in nature and focuses on the possession of EI and its relationship to academic performance, stress and well-being, and leadership abilities (Aradilla-Herro, Tomas-Sabado, & Bomez-Benito, 2014; Carvalho, Guerrero, & Chambel, 2018; Codier & Odell, 2014; Montes-Berges & Augusto, 2007; Por, Barriball, Fitzpatrick, & Roberts, 2011). EI does have the

potential to be developed (Mayer, Salovey, & Caruso, 2004). Reflective learning activities and collaborative learning experiences have been found to increase EI (Borges, Kirkham, Deardorff, & Moore, 2012; Harrison & Fopma-Loy, 2010). EI skills need to be explicit in nursing education as they might impact the quality of learning, ethical decision-making, critical thinking, and clinical practice (Smith, Profetto-MGrath, & Cummings, 2009).

No recommendations or criteria exist for integrating EI concepts or abilities into nursing education. According to the IOM (2011), a barrier in the preparation of safe practicing nurses is failing to impart relevant competencies in nursing curricula. Engaging with emotions in clinical contexts, engaging with emotions in clinical reasoning, and incorporating emotions in clinical decision making have been identified as critical components to nursing practice (Hutchinson, Hurley, Kozlowski, & Whitehair, 2017), but evidence related to how nurses and nursing students actually do this is limited. Emotions need to be included in clinical reasoning and decision-making processes, because they provide practitioners with a resource for providing quality medical care (Marcum, 2013). Preliminary evidence points to low levels of EI impacting quality of care; however, little is directly known about the impact of a nurse's EI on patient care outcomes (Adams & Iseler, 2014). In order to prepare safe and effective nurses who provide quality care, a foundational first step is to understand the EI of nursing students and how emotions are used in clinical learning experiences.

Emotional reasoning is a hallmark of excellent clinical reasoning (Benner, Hughes, & Sutphen, 2008). In order to effectively engage in reasoning to solve complex health care problems, nurses must be able to use their own emotions and understand the

implications of these emotions to facilitate thinking (Shanta & Connolly, 2013). Given the complexity of the current healthcare environment, exploring EI in nursing students is necessary to effectively prepare them for professional practice. Understanding the relationship between EI and clinical reasoning and how students use emotion in clinical practice will provide foundational information that will assist nurse educators in investigating strategies to effectively prepare nursing students for professional nursing practice.

Statement of the Problem

Clinical reasoning is an established learning outcome for nursing students and essential for the provision of safe and effective care (Benner et al., 2010); however, the evidence related to the influences of emotions on how health professionals perceive information, what they recall, and the decisions they make is limited (Hutchinson et al., 2017; LeBlanc, McConnell, & Monteiro, 2015). The nursing literature calls for further investigation of the interplay between EI and clinical reasoning in nurses and nursing students (Shanta & Gargiulo, 2014; Smith et al., 2009). A deeper understanding of EI and its relationship to clinical reasoning in nursing students is necessary for nurse educators to thoroughly prepare nursing students for safe practice.

Purpose of the Study

The purpose of this pilot study was to explore the EI of senior bachelor of science in nursing (BSN) students and its relationship to clinical reasoning to gain a better understanding of how these students' emotions are used in clinical learning experiences. This study used a convergent parallel mixed method approach to obtain quantitative statistical results and converge the data with reflection prompt results from a sample of

senior BSN students located in the Midwest. In the quantitative component, the relationship between EI and clinical reasoning was addressed by using valid and reliable measurement tools. The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), an ability-based instrument, measured EI. The Health Sciences Reasoning Test (HSRT) was used to measure clinical reasoning. The qualitative component consisted of two reflection prompts that explored the emotions experienced during clinical learning experiences and how students used those emotions to guide patient care.

Specific Goal of the Study

The specific goal of this study was to provide nurse educators with an understanding of EI and its relationship with clinical reasoning in senior BSN students. Collecting and converging the quantitative and qualitative data allowed for greater insight into the relationship between EI and clinical reasoning than what would be obtained by either type of data separately.

This study aimed to:

1. Investigate the relationship between EI and clinical reasoning in senior BSN students.

2. Explore senior BSN students' use of emotions in clinical learning experiences.

Research Questions

Four research questions and one hypothesis informed this research study.

Research question one. What is the relationship between EI and clinical reasoning in senior BSN students?

Hypothesis one. Senior BSN students who score higher in *total EI*, *EI areas*, and *EI abilities* will also score higher in overall clinical reasoning and each of its five scales.

Research question two. What emotions do senior BSN students describe experiencing in patient care encounters during clinical learning experiences?

Research question three. How do senior BSN students describe the impact of their emotions in guiding care during clinical learning experiences?

Research question four. In what ways, if any, do the qualitative results from the reflection prompts on emotions in clinical learning experiences relate to the quantitative results on the relationship between EI and clinical reasoning in senior BSN students?

Definitions

The following definitions were used for this study.

Traditional BSN program. A four-year undergraduate baccalaureate program that prepares students to graduate with a nursing degree and take the National Council Licensure Examination-Registered Nurse (NCLEX) exam (American Association of Colleges of Nursing [AACN], 2019).

Senior BSN students. Senior BSN students enrolled in their senior year, final semester of a baccalaureate nursing program. These students will be in progress with or completed a final clinical learning experience in the nursing program.

Clinical learning experience. A clinical learning experience is an experiential learning activity outside of the classroom setting where nursing students engage in nursing practice with client(s)/patient(s) to meet healthcare needs. These experiences are under the direction or guidance of a nursing faculty member or preceptor and can occur at a healthcare facility, in a simulation lab, or be community based (AACN, 2019).

Emotional Intelligence (EI). EI is **"**the ability to monitor one's own and others' feelings and emotions, to discriminate among them, and to use this information to guide one's thinking and actions," (Salovey & Mayer, 1990, p. 189).

Clinical reasoning. Clinical reasoning is the process used to make clinical judgments, or a clinical decision, and includes assessing cues, interpreting cues into meaningful patterns, acting as appropriate in response to the cues, and reflecting on the outcome of the clinical judgment (Tanner, 2006). The process of clinical reasoning includes using cognition (critical thinking), metacognition (reflective thinking), and discipline specific knowledge (Simmons, 2010).

Critical thinking. Critical thinking is purposeful thought and self-regulatory judgment encompassed by interpretation, analysis, explanation, inference, and evaluation (Facione & Facione, 1996).

Clinical judgment. Clinical judgment is the "ways in which nurses come to understand the problems, issues, or concerns of clients/patients, to attend to salient information, and to respond in concerned and involved ways," (Benner, Tanner, & Chesla, 1996, p. 2).

Assumptions and Limitations

This section identifies assumptions and potential limitations for this research study, which may have impacted the inferences drawn from the conclusions of this study.

Assumptions. This study was based on the following assumptions:

1. All participants will participate voluntarily and answer the reflection prompts and assessment tool questions in an honest and truthful manner.

2. The quantitative measurement tools used for data collection are valid and credible assessments that measure their respective concepts. The MSCEIT measures EI, and the HSRT measures clinical reasoning.

3. The inclusion criteria are appropriate and all participants are senior BSN students enrolled in the final semester and in process with or completed a final clinical experience. All participants have experienced the same nursing curriculum and designated clinical learning experiences.

4. The number of participants will be sufficient enough for which to adequately draw conclusions and reach saturation.

Limitations. The following limitations were projected for this study:

1. The sample population will be a small, non-probability convenience sample of senior BSN students enrolled at one institution in the Midwest-region of the United States. This will limit the generalizability of the study as it is unlikely that this sample is representative of all BSN programs.

2. Bias may be present in those who self-select to participate in this study, producing results atypical of this population.

3. The HSRT is intended for assessment of clinical reasoning, critical thinking, and clinical decision making in health science students and professionals, but it is not specific to nursing. Additionally, even though many questions assess clinical reasoning, the tool is grounded in critical thinking theory, which may impact the adequate measurement of clinical reasoning in this population.

4. There may be unknown conditions or factors with the participants outside of the nursing curriculum and designated clinical experiences that could bias responses to the reflection prompts.

Chapter 2: Review of the Literature

Chapter 2 begins with an overview of the theoretical framework used to guide this study, followed by a review of the literature on EI. The theoretical framework overview provides meaningful background information on the concept of EI, assisting in the interpretation of the review of the literature. The conceptual link between EI and clinical reasoning is explained by applying Mayer, Salovey, and Caruso's (2004) Four Branch Ability Model of EI. The review of the literature is focused on EI, with an emphasis in nursing and nursing students. The relationship between EI and clinical reasoning is also investigated. The guiding theoretical framework and review of literature provide context for this study's purpose, which was to explore the EI of senior BSN students and its relationship to clinical reasoning in order to gain a better understanding of how emotions are used in clinical learning experiences.

Theoretical Framework

The Four Branch Ability Model of EI (Mayer et al., 2004) guided this research study that sought to understand EI and its relationship to clinical reasoning in senior BSN students. Figure 1 provides a visual of the Four Branch Ability Model. Ability EI reflects the skill of being able to emotionally reason (Codier & Odell, 2014). EI is described as an essential ability in nurse's decision-making and creative processes because it captures and interprets the immediate context (Akerjordet & Severinsson, 2007). Clinical learning experiences are a component of nursing education where nursing students make decisions and develop clinical reasoning skills. Clinical reasoning is a cognitive process used to make clinical judgments, or a clinical decision, and includes assessing cues, interpreting cues into meaningful patterns, acting as appropriate

in response to the cues, and reflecting on the outcome of the clinical judgment (Tanner,

2006). According to Mayer et al. (2004), EI is related to cognitive intellect through the

ability to reason with information at hand in order to find meaning.

Emotional Intelligence (EI)

| Experiential EI | Strategic EI |

Perceiving Emotions   Using Emotions   Understanding Emotions   Managing Emotions
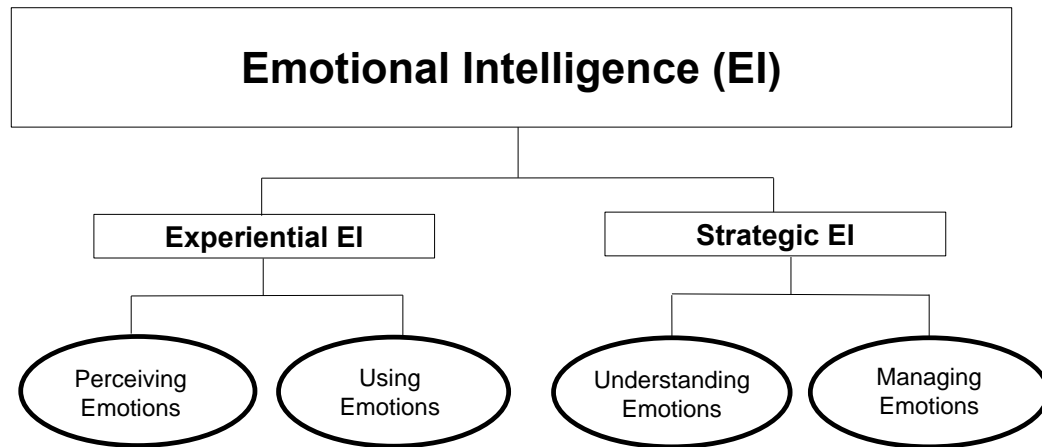
Figure 1. Representation of the Four Branch Ability Model of Emotional Intelligence

(Mayer, Salovey, & Caruso, 2004).

Emotional intelligence was first conceptualized and described as a set of

interrelated abilities by Salovey and Mayer (1990) and defined as "the ability to monitor

one's own and others' feelings and emotions, to discriminate among them, and to use this

information to guide one's thinking and actions" (p. 189). Mayer and Salovey (1997)

expanded on this original conceptualization to include the capacity to reason with

emotion in four specific abilities: perceive emotion, facilitate emotion into thoughts,

understand emotions, and manage emotions. In the Four Branch Ability Model of EI, EI

consists of two areas, Experiential EI and Strategic EI, that overarch four main branches, or EI abilities: Perceiving Emotions, Using Emotions, Understanding Emotions, and Managing Emotions (Mayer et al., 2004). The branches represent a rough hierarchy, starting with the ability to perceive emotions accurately as fundamental and then skills develop from basic to more sophisticated within each ability (Mayer & Salovey, 1997).

Experiential EI consists of two components: 1) the ability to perceive emotion (how emotions feel), and 2) the ability to use emotion in thought (how to classify such feelings) (Mayer, Salovey & Caruso, 2018). This area is being able to recognize emotion in information and then reason through that data. The first branch, perceiving emotions, is the ability to correctly recognize emotion in self and other and includes recognizing emotion in other forms such as music and verbal merits (Mayer et al., 2004). These emotions are labeled as either positive or negative. The ability to perceive emotion is important for assessing people's moods and situations for feedback, including one's own emotions. The second branch, using emotions, is the ability to facilitate the identified emotions to assist in thinking and solving problems, which integrates emotions into the reasoning process (Mayer et al., 2004). Experiential EI is the ability for a person to cognitively process the emotions felt, compare it to previous emotions and feelings for further evaluation, and then gauge behaviors based on prior experiences (Mayer, Caruso, & Salovey, 2000).

Strategic EI is a higher-level, conscious processing of emotions that requires reasoning about emotions, their development over time, how they may be managed, and how to fit into social situations (Mayer et al., 2018). This area relates to the ability to think through emotional data and come to a decision that is acted upon. Self-awareness is

central for the strategic area of EI and its subsequent branches: understanding emotions and managing emotions. Understanding emotions involves the capacity to analyze emotions and their causes, understand the possible outcomes related to these emotions, and predict how people will emotionally react (Mayer et al., 2004). Included in this ability is being able to comprehend the impact positive or negative emotions can have in a situation (Mayer et al., 2008). Managing emotions, the final branch, reflects the ability to manage emotions in the context of individual goals, self-knowledge, and social awareness, and includes the management of others emotions (Mayer et al., 2004). Strategic EI and its branches may be used to integrate emotion and thought in order to make effective decisions.

The Four Branch Ability Model of EI was used as a guiding framework to better understand the EI of senior BSN students and its relationship to their clinical reasoning skills. This model frames the overall concept of EI as an ability that pertains to the relationship between emotion and cognition (Mayer et al., 2004). The Four Branch Ability Model of EI was chosen for the following reasons:

1. This ability reflects mental performance rather than a preferred way of behaving and can be measured by empirical standards (Mayer et al., 2000). The MSCEIT, which measures EI as an ability based on performance of emotional tasks, was created specifically from this theoretical framework. The MSCEIT quantitatively measures the construct of EI, the two EI areas, and four EI branches. The MSCEIT was used to operationalize EI in this study.

2. This model integrates reasoning concepts from previous research correlating emotions with reasoning (Mayer et al., 2004). Clinical reasoning was

quantitatively measured in this study with the HSRT, a valid and reliable tool that measures critical thinking in healthcare context situations.

3. To advance the state of the science related to EI in nursing, an ability based model is recommended (Foster et al., 2015). The limited research on EI in nurses and nursing students is mostly quantitative and grounded in the trait model, which describes EI as a personality and uses self-report tools for measurement. A mixed methods research study using the Four Branch Ability Model of EI as a guiding framework provides a deeper understanding of the EI of nursing students and the relationship EI has to clinical reasoning.

Review of Literature

Relevant literature was reviewed through a comprehensive search of library holdings and databases including: Cumulative Index of Nursing and Allied Health Literature (CINAHL), PsycINFO, Business Source Premier, Education Resources Information Center (ERIC), and MEDLINE Web of Knowledge. Broad searches included all possible dates in the selected databases, focusing on most articles published in the last 10 to 15 years. The following terms were searched individually, in relationship to one another, and in relationship to nursing and nursing students: "emotional intelligence," "clinical reasoning," "critical thinking," and "clinical judgment." Findings from the literature review were synthesized into four general sections: EI; EI and Nursing; EI and Nursing Students; and EI and Clinical Reasoning.

EI

A person's emotions convey a set of identifying signals that communicate information about a situation which impact one's perceptions and ultimately their

response to that situation (Mayer et al., 2004). EI was first addressed in the psychological literature by Salovey and Mayer (1990) as a subset of social intelligence and plays a part within the traditional intelligence fields. Their work was based off findings from previous research that one's intelligence quotient does not describe the full capability of intelligence and that human behavior is explained by other intelligence (Salovey & Mayer, 1990). Defined as the "ability to monitor one's own and other's feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions," (Salovey & Mayer, 1990, p. 189), the scope of EI includes the verbal and nonverbal approval and expression of emotion, regulation of emotion in self and others, and utilization of emotional content in problem solving (Mayer & Salovey, 1993). Essentially, EI is the ability to recognize the meanings of emotions in situations and to reason and problem-solve on the basis of them (Mayer et al., 2000).

Theoretical models of EI. Several authors have explored the concept of EI using different theoretical models (Bar-On, 2006; Goleman, 2006; Mayer & Salovey, 1997; Schutte et al., 1998). Three main models have emerged from the research that seek to explain and describe the general concept of EI: the ability model, the personality or trait model, and the mixed model.

Ability model of EI. The ability model describes a person's EI as an actual skill that centers on feelings and how these feelings interrelate with thinking. This model focuses on how emotional information is processed by individuals and the abilities required to do such processing (Mayer & Salovey, 1997; Mayer et al., 2004). The Four Branch Ability Model of EI includes the ability to perceive, facilitate or use, understand, and manage emotions and thoughts and is often referred to as a collective blend of

emotion and intelligence (Mayer et al., 2004). Abilities are measured by the MSCEIT, a skill performance instrument (Mayer et al., 2004). This is the only test that measures EI as an ability and has been extensively researched in studies examining its validity and reliability (Maul, 2012). EI ability performance is compared to standard performance scales that use expert scoring, which is advantageous over self-report scales used by other models of EI (Brackett & Mayer, 2003); however, the MSCEIT tool has lacked face and predictive validity when used in the workplace (Bradberry & Su, 2006). Nursing practice revolves around skills that are associated with the ability model and subsequently its measurement tool.

Personality model of EI. The personality model, also known as the trait model, describes EI as consisting of underlying traits of interpersonal and intrapersonal qualities. In the personality model, EI is viewed as a personality trait that encompasses emotion-related dispositions and self-perceptions (Petrides & Furnham, 2003). Bar-On's (2006) Model of Emotional and Social Intelligence (ESI) is the most common personality model and consists of five major areas of skills each with subsets and competencies: intrapersonal, interpersonal, stress management, adaptability skills, and general moods. The Schutte Test (Schutte et al., 1998), the Emotional Intelligence Inventory (Bar-On, 2006), and the Trait Emotional Intelligence Questionnaire (Petrides & Furnham, 2003) all measure EI as a personality trait. All of these instruments have demonstrated high reliability and construct validity (Keefer, 2015). Like the ability model, the skills associated with the personality model are also important components of nursing practice; however, the fact that self-report instruments are used for measurement of EI in this model creates limitations for adequate measurement in rigorous research studies.

Mixed model of EI. The mixed model defines EI as a blend of both traits and ability. In this mixed model, EI is viewed as separate from cognitive intelligence but complementary to academic intelligence (Goleman, 2006). The mixed model focuses on four domains of EI: self-awareness, self-management, social awareness, and relationship management (Goleman, Boyatzis, & McKee, 2013). The mixed model of EI guides most of the literature in the business discipline, particularly with leadership abilities. The Emotional Competency Inventory (ECI) 360-degree instrument (Boyatzis & Sala, 2004) is used for measuring EI in this mixed model. This tool relies on assessments of an individual done by others (supervisor, employees, peers) and has issues related to bias and validity as it overlaps with other personality instruments (Mayer, Salovey, Caruso, & Cherkasskiy, 2011).

The concept of EI and assessing it has been in the literature since the early 1990s, not a significantly long period of time. This emergence of the concept of EI has resulted in three theoretical models, the ability model, the personality model, and a mixed model, that are prominent in the literature. While the evidence is beginning to support ability testing over self-report as a more reliable way to test for EI (Mayer et al., 2018), a lack of an agreed upon model impacts how EI is defined and measured, making it difficult to integrate and synthesize research findings (Shanta & Gargiulo, 2014).

EI in the workplace. The concept of EI became a topic of interest in the general workplace in the mid 1990's when Goleman (2006) highlighted the importance of the concept for successful interpersonal relationships. The main focus of EI research has been on its importance with leadership abilities and styles that impact workplace dynamics. Harms and Crede (2010) completed a meta-analysis of 62 independent

samples to evaluate the relationship between EI and different leadership styles,

specifically transformational and transactional leadership. Using the credibility interval,

the authors found a moderately strong correlation between EI and transformational

leadership style. An important finding of this meta-analysis was that trait measures of EI

tended to show higher validities than ability-based measures (Harms & Crede, 2010).

This is supported by Follesdal and Hagtvet (2013) in their investigation of EI as a

predictor of transformational leadership in 104 executives. Using an ability-based model

and measurement, EI did not predict transformational leadership styles ($p > .05$)

(Follesdal & Hagtvet, 2013). While the results of EI and its relationship to beneficial

leadership styles in the workplace demonstrate promising results, findings are dependent

on the use of trait versus ability models.

Another aspect of EI in the workplace has related successful employee outcomes

to leaders who demonstrate higher levels of EI (Feather, 2009; Momeni, 2009). Webb

(2014) found a relationship between managers' EI and employee satisfaction and

commitment. In a study of 249 full-time employees across multiple industries, leaders'

EI scores, specifically emotionality and sociability sub-scores, were associated with

increased employee satisfaction ($p < 0.001$). Kavetsios, Nezlek, and Vassilakou (2012)

had similar findings with school directors (n = 51) and teachers (n = 281) in that a

leaders' ability to perform emotional reappraisal strategies was positively related to the

followers' emotions and attitudes in the work setting. In the teachers, suppression of

emotion was negatively related to job satisfaction ($p < 0.01$) whereas reappraisal of

emotion was positively related to job satisfaction ($p < 0.10$) (Kavetsios et al., 2012).

Higher EI levels in employees have been associated with higher job satisfaction as well

(Moon & Hur, 2011). Three EI sub-scores were negatively associated with emotional exhaustion in the workplace: appraisal of own emotions ($p < 0.05$), optimism ($p < 0.01$), and social skills ($p < 0.05$) (Moon & Hur, 2011).

Although these studies are in non-nursing professions, the results are important because of the complexities in the healthcare system related to layers of leadership and highly stressful and emotional patient care environments. The EI and overall abilities of nurse leaders and nurses in their practice environment may have an impact on their provision of safe patient care if there is higher job satisfaction and less emotional exhaustion.

EI and Nursing

Emotion, compassion, and caring are foundational to nursing, making EI a significant issue for the profession (Smith et al., 2009; Szeles, 2015). EI is one of the essential qualities required by nurses to effectively relate to their patients and colleagues in difficult circumstances (Rankin, 2013). The literature on EI in professional nursing focuses on its relationship to stress and well-being, leadership abilities, and quality patient care.

Stress and wellbeing. Because of the complexity of the current healthcare environment, nursing is a highly stressful profession which can negatively impact wellbeing and lead to burnout. In study of 312 nurses, a higher level of EI was associated with a higher level of wellbeing ($p < 0.01$) and a lower level of job stress ($p < 0.05$) (Karimi, Leggat, Donohue, Farrell, & Couper, 2014). Augusto Landa, Lopez-Zafria, Martos, and Aguilar-Luzon (2008) also found that nurses (n = 180) who scored higher in EI, specifically the sub-scores of clarity and emotional repair, reported less stress ($p <$

0.05); however, those who scored high in attention to emotions experienced greater levels of stress ($p < 0.05$). Findings by Montes-Berges and Augusto-Landa (2014) partially confirm the relationship between EI and psychological wellbeing, as only some but not all dimensions of higher EI were correlated with enhanced psychological wellbeing. In this study of 85 nurses, it was found that nurses who attempted to reduce or eliminate negative emotions while increasing or maintaining positive emotional intensity reported a higher life satisfaction and wellbeing (Montes-Berges & Augusto-Landa, 2014). In addition to stress and wellbeing, self-compassion has been found to positively correlate with EI ($p < 0.0001$) (Heffernan, Griffin, McNulty, & Fitzpatrick, 2010). Heffernan et al. (2010) focus their findings on the consequences of self-compassion, specifically lack of self-compassion, and the implications this has for the ability to care for others which could negatively impact patient satisfaction levels.

High levels of stress may lead to nurses leaving the profession. According to Kovner, Brewer, Fatehi, and Jun (2014), new RNs leave their jobs at significantly high rates. Görgens-Ekermans and Brand (2012) investigated the relationship of EI to stress and burnout in 122 nurses. The emotional management and emotional control sub-scores of EI were found to be negatively associated with self-reported stress ($p < 0.01$) and burnout ($p = < 0.01$), indicating that higher EI was significantly related to lower stress and burnout. Kaur, Sambasivan, and Kumar (2013) found that nurses' EI (n $= 550$) significantly influenced burnout ($p < 0.01$) and caring behaviors of nurses ($p < 0.01$), with psychological ownership mediating the relationship between EI and caring behaviors. This is supported by Karimi et al. (2014) in their findings that the higher the

EI, the higher the psychological ownership, the higher the caring behaviors, and the lower the burnout.

While most evidence linking EI to stress and wellbeing is quantitative and correlational in nature, Sarabio-Cobo et al. (2017) completed an interventional study that investigated the impact of EI on coping styles of nurses. After completing a workshop specifically on EI with nurses and certified nursing assistants (n = 87), a significant increase in EI and coping styles was found post-workshop and again one year later ($p = 0.01$) (Sarabia-Cobo et al., 2017). This is promising and fuels the need for further investigation, particularly a need for experimental studies, on the development of EI in nurses, its impact on stress and wellbeing, and ultimately its potential impact on quality care.

The personality, or trait model of EI has been the most common guiding theoretical framework for investigating the correlation between EI and stress and wellbeing in nurses. Investigating this relationship using an ability based model and measurement tool is lacking in the literature. As the healthcare system continues to be plagued with high RN turnover rates (Kovner et al., 2014), a deeper understanding of EI and the role it plays in nursing is essential.

Leadership abilities. In addition to stress and wellbeing, an increasing amount of research has been directed towards the importance of EI in nursing as it relates to organizational variables, specifically leadership. Organizational variables can significantly impact the health and wellbeing of nurses, which can also impact nurse turnover rate and ultimately safe patient care (Kovner et al., 2014).

For healthcare organizations to be successful, EI competencies are essential in nurse leaders (Heckemann, Schols, & Halfens, 2015). In a sample of 148 nurse managers, Echevarria, Patterson, and Krouse (2017) found a positive correlation between EI and transformational leadership style ($p < 0.001$). In another sample of 148 nurse managers, Spano-Szekely, Griffin, Clavelle, and Fitzpatrick's study (2016) took this one step further and found that not only was EI positively correlated with transformational leadership ($p < 0.001$) but negatively correlated with laissez-faire leadership style ($p < 0.001$). Due to current complex and rapidly changing healthcare system, transformational leadership abilities are important for successful healthcare organizations and work environments.

Leadership styles of nurse managers may impact the nurse turnover rate, which can ultimately impact staffing ratios and quality patient care. In a study of 535 nurses, Wang, Tao, Bowers, Brown, and Zhang (2017) found that nurses EI and perception of transformational leadership abilities of nurse managers were predictors of nurse intent to stay ($p = 0.000$). Although this study had a robust sample size, it was limited to one large region which limits the generalizability of the study findings (Wang et al., 2017). Transformational leadership qualities also might serve to support the effective handling of conflict and bullying of team members because of the higher EI abilities associated with transformational leaders (Hutchinson & Hurley, 2013). Morrison (2008) found that higher levels of EI positively correlated with collaborating and negatively with accommodating styles of conflict management. Transformational leadership uses a teamwork approach to inspire change and creates and maintains a positive working

environment (Tyczkowski et al., 2015), all necessary given the complex healthcare environment that nurses work in today.

Quality patient care. Although not as robust as the literature relating EI to stress, wellbeing, and leadership, there is beginning evidence on the importance of EI to nursing performance and patient outcomes. To ensure positive patient outcomes, nurses must use effective interpersonal skills to work effectively within the larger healthcare team (McCallin & Bamford, 2007). Quoidbach and Hansenne (2009) did not find any correlation between overall EI and team performance or healthcare quality. However, they did find positive correlations between the EI sub-score of emotion regulation and output of healthcare quality ($p = 0.019$) and group cohesiveness ($p = 0.031$) in 23 nurse teams. While promising, this study had a small sample size relative to the concept of teams, and healthcare quality was determined by specific criteria used at the hospital where the study took place, limiting the study's generalizability (Quoidbach & Hansenne, 2009). In a follow-up to a pilot study, Codier et al. (2009) found that EI correlated positively with performance level in a convenience sample of 350 clinical staff nurses. Three subscale scores of EI were found to be positively correlated with performance as ranked on a clinical ladder, all at significance level $p = 0.05$ (Codier et al., 2009). Adams and Iseler (2014) correlated EI abilities of nurses to specific quality care outcomes such as infection, falls, and pressure ulcers ($p < 0.001$). Even though the study was small (eight clinical units in two urban hospitals in the Midwest United States), findings are encouraging and support further investigation of the development of EI in nurses to increase the quality of care in hospitals (Adams & Iseler, 2014).

Qualitative findings also support EI competencies as being essential to improved patient outcomes and quality care. Using interpretive phenomenological analysis from five interviews, Davies, Jenkins, and Mabbett (2010) found that nurses perceived EI to be an essential part of their role and essential to quality care, especially in relation to palliative care. The evidence related to the role of nurses' EI and its relationship to patient outcomes is minimal. However, this small amount of research is foundational and pertinent to further investigation into EI and its role in quality outcomes and safe patient care.

Even though EI has been recognized as central to nursing practice, gaps in knowledge about EI and nursing practice continue to exist (Smith et al., 2009). The empirical evidence investigating the impact of EI in nursing is growing, however the models used to guide this research vary and are inconsistent throughout the literature.

EI and Nursing Students

Nursing students are at an important developmental stage of becoming professional nurses. Classroom and clinical learning experiences expose students to a variety of challenges within healthcare settings in an effort to develop competent and safe practicing nurses. Nurses who are proficient with identifying and managing emotions are able to process information and facilitate effective communication with patients, families, and colleagues (Shanta & Connolly, 2013). Including EI concepts in nursing education may impact quality of student of learning, ethical decision-making, critical thinking, and evidence and knowledge use in clinical practice (Smith et al., 2009).

Stress and well-being. Similar to the research on EI in nurses, the majority of research with nursing students and EI has been on its relationship to stress and wellbeing.

The rigor of nursing education programs brings to light the realities of working as a professional nurse and being able to effectively cope with the stress associated with academic and clinical placement demands. EI has been found to positively correlate with wellbeing levels. In a sample of 303 nursing, medicine, and physiotherapy students, Carvalho et al. (2018) found EI to have a positive direct effect on satisfaction with life over the period of one year while in their respective programs. Por et al., (2011) found EI to be positively related to wellbeing ($p < 0.05$) and negatively correlated with perceived stress ($p < 0.05$) in a sample of 130 nursing students. John and Al-Sawad (2015) also support the negative correlation between EI and stress ($p < 0.01$).

Effective coping strategies are important to manage the stressful situations experienced in healthcare. Avoidance coping strategies were also found to negatively correlate with EI in a sample of 119 first semester nursing students ($p < 0.05$) (Montes-Berges & Augusto, 2007). Nursing students who have higher EI are able to identify specific emotions during stressful situations and focus on resources that allow them to have more adaptive coping strategies (Montes-Berges & Augusto, 2007). In a qualitative study, McCloughen and Foster (2017) found that the use of emotionally intelligent behaviors by nursing and pharmacy students were effective to manage stressful personal interactions in the clinical placement setting. Additionally, in a sample of 275 nursing students, research indicated that lower EI was associated with more risky health behavior, such as alcohol consumption, unhealthy diet, and unsafe sex ($p < 0.02$) (Lana, Baizan, Faya-Ornia, & Lopez, 2015). It is recommended that students are specifically educated in ways to strengthen their EI because they are frequently exposed to stressful clinical

environments and challenging interpersonal encounters in the healthcare setting (McCloughen & Foster, 2017).

Academic and clinical performance. In addition to stress and wellbeing, EI has been investigated for its relationship to academic and clinical performance in nursing students. Academic and clinical performance are closely monitored throughout nursing programs to determine readiness for professional practice. EI was found to be a significant predictor of grade point average (GPA) ($p = 0.023$) in a sample of 81 accelerated nursing program students (Fernandez, Salamonson, & Griffiths, 2012). It was also found to be a predictor of academic performance ($p < 0.05$) in 178 student nurses (Rankin, 2013). Positive correlations ($p < 0.05$) have also been found to exist between EI and GPA (Codier & Odell, 2014; Sharon & Grinberg, 2018). In addition to finding a positive correlation between overall EI and GPA, Codier and Odell (2014) also found that of the EI subscores, experiential EI was significantly correlated with GPA ($p < 0.05$) while strategic EI was not ($p > 0.05$).

Nursing students apply cognitive, psychomotor, and affective skills in clinical learning settings and EI has been found to relate to the clinical performance of students. Using the MSCEIT to measure EI, Beauvais, Brady, O'Shea, and Griffin (2011) found that EI was significantly correlated with total nursing performance ($p = 0.02$) as identified by the Six Dimension Scale of Nursing Performance (6-D) Scale in a sample of 87 nursing students. Additional evidence using the MSCEIT also demonstrates a positive correlation between EI and clinical performance ($p < 0.05$) in a sample of 104 nursing students (Marvos & Hale, 2015). While this positive correlation is noteworthy and promising, the measurement of clinical performance is inconsistent in studies and based

on self-report tools, which impacts the ability to draw significant conclusions. Rankin (2013) found a significant predictive relationship between EI and practice performance using a program clinical assessment tool completed by faculty ($p = 0.00$). Although this is a more objective means for evaluating clinical performance, there was no discussion of this measure having any reliability or validity testing completed. In addition to the concerns with the program clinical assessment tool, a trait EI model was used to guide the measurement of the concept of EI in this study (Rankin, 2013). Emotional abilities are important aspects to consider as they may contribute to the effectiveness of care provided by nursing students in clinical learning experiences.

EI development. Nursing education programs foster the development of safe and holistic nurses who care for patients physically, spiritually, and emotionally. EI is an essential skill to be developed and needs to be explicit in nursing education (Foster et al., 2015; Freshwater & Stickley, 2004; Smith et al., 2009). Whether or not EI regularly develops with time or it can be specifically developed with specific strategies and experiences remains somewhat of a controversy.

EI has been found to increase from beginning to end of nursing programs, without any specific pedagogical or interventional strategies implemented. In a cross-sectional study, Benson, Ploeg, and Brown (2010) found the difference in total EI score significantly different for nursing students in Year 1 versus Year 4 ($p < 0.05$). However, the 25 student participants from each Year (1, 2, 3, and 4) were from a small convenience sample and all female, limiting the generalizability of the findings. Foster et al. (2017) assessed the EI of 111 nursing students at the beginning and end of their nursing program and found a significant increase in overall EI ($p = 0.012$). Similarly, Larin et al. (2014)

investigated the change in EI from beginning to end of program study in 132 nursing and physical therapy students and found a significant increase in overall score ($p < 0.001$). However, when compared with each other, no significant differences were found in the amount of EI development based on the two different curriculums (Larin et al., 2014). Therefore, these findings were unable to discriminate whether or not EI developed due to the healthcare curriculum or basic developmental experiences outside of educational experiences. Shanta and Gargiulo (2014) used a between-groups comparison of EI in pre-nursing (n = 119), senior nursing (n = 67), pre-education (n = 37), and senior education (n = 28) students to explore the influence of nursing education on the level of EI of the student participants. Results revealed no significant differences between the mean scores of the senior nursing students and students in the other education groups. A concerning finding from Shanta and Gargiulo (2014) was that although senior nursing students had strong EI reasoning abilities, they declined in their ability to perceive emotion. It is recommended that nurse educators reinvest in including specific components focused on empathetic care in their teaching and learning strategies, in addition to addressing cognitive elements necessary for clinical reasoning (Shanta & Gargiulo, 2014). This review of the literature found the trait model, which utilizes self-report tools, as the predominant model for guiding the research of EI in nursing education.

While preliminary evidence supports the growth of EI throughout nursing programs, limited evidence exists on the impact of specific pedagogical strategies that develop or enhance EI in nursing students. The use of reflection as a teaching and learning strategy has been suggested as beneficial in developing self-awareness and

enhancing EI (Heckemann, et al., 2015; Horton-Deutsch & Sherwood, 2008). Harrison and Fopma-Loy (2010) created 10 reflective journal prompts for nursing students in a mental health course (n = 16). These prompts were designed to stimulate reflection on EI competencies using Goleman's mixed model framework of EI. The journal responses were analyzed and excerpts from student responses demonstrated competencies of each of the four domains of EI in Goleman's framework. The prompts were found to provide an effective teaching strategy with strong implications for further quantitative analysis on how EI may develop from reflective strategies (Harrison & Fopma-Loy, 2010).

Peer coaching has also been investigated as a means to develop EI in student nurse leaders. Using a mixed methods approach, Szeles (2015) found no significant change in pre/post measurement of EI in a group of student nurse leaders (n = 13) when using the ability-based MSCEIT. While the authors recognized that the quantitative results may have been affected by the small sample size, the qualitative survey found 80% of participants perceived changes in EI ability and 90% reported peer coaching beneficial to leadership development (Szeles, 2015). Additional experimental studies, specifically with larger sample sizes, are warranted for a better understanding of strategies that may develop or enhance EI in nursing students. Additionally, an ability-based model is recommended for curricula and teaching and learning approaches. An ability-based model provides a validated conceptual basis from which to develop curricula components and subsequently measure students' EI ability (Foster et al., 2015).

While the evidence points to the beneficial effects of EI and its development in nursing students, the research completed uses a variety of models to guide the investigation of EI (Lewis, Neville, & Ashkanasy, 2017). This directly impacts and

changes the type of instrumentation selected for the various studies. Self-report, or trait-based, measures have been the most predominant type of measurement tools used in the literature, followed by mixed-model measures (Foster et al., 2015; Lewis et al., 2017). In order to fully understand EI in nursing students, more consistency is needed in EI measurements. Ability-based models are recommended to provide this consistency (Foster et al., 2015; Hutchinson et al., 2017).

EI and Clinical Reasoning

High level EI abilities have been identified as beneficial for effective nursing care, yet little attention has been given to the relationship between EI and how one clinically reasons in the nursing literature (Hutchinson et al., 2017). Judgment and decision making can be significantly impacted by the emotions one experiences, with positive emotions facilitating more efficient decision making (Hutchinson et al., 2017). Clinical reasoning directs nurses in assessing, assimilating, retrieving, and/or discarding information available for the provision of quality patient care (Simmons, 2010). For clinical reasoning to occur, critical thinking skills must be applied (Victor-Chmil, 2013). Critical thinking is knowledge based, not dependent on the situation at hand (Victor-Chmil, 2013), and includes the following skills determined by the American Philosophical Association (APA) Delphi Report of 1990: interpretation, analysis, evaluation, inference, explanation, and self-regulation (Facione & Facione, 1996). According to Facione and Facione (1996), critical thinking is referred to as the cognitive engine that drives the process of knowledge development and professional judgment. Clinical reasoning is a complex process that involves critical thinking skills, as well as cognition, metacognition, and discipline specific knowledge to collect and examine

information, evaluate it, and then act based on that information (Simmons, 2010; Tanner, 2006). Although clinical reasoning is described as an essential competency that nurses must develop, it is a complex cognitive process that involves many elements and little, if any, attention is given to the role of emotions in this process.

One's emotional state may lead to affective biases in decision making, resulting in errors and adverse events (Croskerry, Abbass, & Wu, 2010). According to Croskerry et al. (2010), value bias is a specific emotional bias in decision making, and it is the tendency to believe that positively valued events are more likely to happen then negatively valued events. In a preliminary study on emotional bias in college students (n = 46), Ribeiro and Fearon (2010) found that negative emotional bias limits the capacity to obtain as much information as possible about danger in the environment and can lead to errors. The evidence related to emotional bias in nursing and nursing students in the literature is absent.

With the healthcare environment continuing to evolve in complexity, sound clinical reasoning is a critical skill for nursing students to develop (Deschenes et al., 2011). In an attempt to foster the development of clinical reasoning in nursing students and prepare them for safe transition into professional practice, nursing programs focus on using a variety of teaching and learning strategies. Problematic to this is that the strategies can be quite varied, with the measurements of their effect on clinical reasoning being far-off from actual practice (Rochmawati & Wiechula, 2010). Kuiper and Pesut (2004) suggest nurse educators use a self-regulated learning theory on reflective practice, because the development of clinical reasoning requires developing both cognitive and metacognitive skills.

Clinical experiences, in actual healthcare facilities as well as in simulated environments, are foundational in preparing nursing students for safe professional practice. Exposure to realistic patient experiences are critical to developing clinical reasoning skills (Huhn & Deutsch, 2011). Themes identified through qualitative interviews with baccalaureate nursing students indicated the clinical arena as the most beneficial environment in which to learn clinical reasoning (Herron, Sudia, Kimble, & Davis, 2016).

Much focus has recently been placed on the clinical area in simulated patient care environments and their impact on the development of clinical reasoning in nursing students. Themes related to clinical reasoning have been found in qualitative studies that analyzed students' decision making after simulated patient care experiences (Ashley & Stamp, 2014; Bucknall et al., 2016). Following a simulation scenario, Ashley and Stamp (2014) identified a clear distinction between the reasoning skills of novice students compared with students with more clinical experience through qualitative analysis of one-to-one-debriefing with a total of 104 prelicensure nursing students (sophomore and junior students). High-fidelity simulation (HFS) experiences have been shown to improve knowledge acquisition, critical thinking, clinical judgment, and/or clinical reasoning through the use of quantitative measurement, however these results have not been consistent (Bussard, 2018; Lapkin, Levett-Jones, Bellchambers, & Fernandez, 2010; Macauley, Brudvig, Kadakia, & Bonneville, 2017; Shinnick & Woo, 2013; Sullivan-Mann, Perron, & Fellner, 2009). For example, Sullivan-Mann et al. (2009) implemented a quasi-experimental study where participants (n = 56) were all exposed to HFS, however half of the participants received an additional three HFS scenarios. No significant

differences in clinical reasoning were found between the experimental and control groups during the pretest or post-test ($p > 0.05$). However, when testing for the impact of simulation on each group individually, the experimental group answered significantly more questions correctly than they did on the pretest ($p < 0.05$); whereas, the control group did not ($p > 0.05$) (Sullivan-Mann et al., 2009). Shinnick and Woo (2013) concluded that gains in knowledge do not equate to changes in critical thinking following a one-group, quasi-experimental study of 154 prelicensure nursing students following HFS. The inconsistency in identifying gains in clinical reasoning could be due to a variety of reasons, such as a variety of measurement tools, small sample sizes, and/or the types of simulation scenarios used. In addition, the metacognitive element, specifically the role of emotion, and its relationship to clinical reasoning has not been investigated in simulated patient care environments.

Even less focus has been given to investigating clinical reasoning in non-simulated, or actual clinical care environments. In a 2008 study, clinical reasoning increased for nursing students when the Outcomes-Present State Test (OPT) Model was used to teach clinical reasoning during clinical experiences with a sample of 43 nursing students ($p < 0.001$) (Bartlett et al., 2008). Additionally, a qualitative lens was used to explore how clinical decisions are made by second year BSN students in their first clinical rotation. Findings identified three key encounters impacting students' decision making: encounters with the patient, nursing staff, and clinical teacher, with each encounter revealing an emotion-based and knowledge-based response to the different clinical situations (Baxter & Rideout, 2006). Although focused on experienced nurses rather than students, Hutchinson et al. (2017) explored through qualitative methods

clinical nurses' experiences of using EI capabilities during clinical reasoning and clinical decision-making processes. Semi-structured interviews were completed following an EI training session and one-to-one coaching, with the following themes emerging: the sensibility to engage EI capabilities in clinical contexts, motivation to actively engage with emotions in clinical decision-making, and incorporating emotional and technical perspectives in decision-making (Hutchinson et al., 2017). These qualitative findings indicate the presence and importance of emotions in clinical reasoning and fuel the need for further investigation into this relationship in order to understand how both EI and clinical reasoning may be developed with nursing students.

Summary

EI has been identified as an ability that enables a person to effectively cope with stress and positively interact with others. These abilities are extremely beneficial in nursing given the complex healthcare system where there is constant interaction between nurses, patients, students, and interdisciplinary team members. A lack of consistent definition and measurement of EI across disciplines has led to some criticism of EI in the literature (Smith et al., 2009). For consistency in further analysis of EI during nursing education, it is recommended that an ability-based model be used to guide future research (Foster et al., 2015).

Review of current research surrounding EI suggests a connection between EI abilities and effective clinical reasoning skills because of metacognitive elements associated with clinical reasoning. However, evidence linking EI and clinical reasoning in nursing students has not been fully addressed. Continuing to separate cognition and emotion in research and scholarship is counterproductive (Hutchinson et al., 2017). It is

important for nurse educators to prepare students who exhibit both cognitive and metacognitive skills and in order to do that, a deeper understanding of EI necessary. Therefore, a convergent parallel mixed methods study on the EI of senior BSN students' and its relationship to clinical reasoning was proposed. The ability model of EI provides an operational context for which emotional intelligence and clinical reasoning skills might be developed in nursing students, ultimately impacting the provision of safe and quality care.

Chapter 3: Method and Procedures

The purpose of this pilot study was to explore the EI of senior BSN students and its relationship to clinical reasoning to gain a better understanding of how emotions are used in clinical learning experiences. To date, there is limited evidence of the relationship between EI and clinical reasoning in nursing students, with the existing evidence being either quantitative or qualitative in nature. In order to fully comprehend the EI abilities of student nurses and its relationship to clinical reasoning, a convergent parallel mixed methods approach was appropriate. Using this type of mixed methods approach aimed to provide a deeper explanation of EI in nursing students and support future research related to its development and potential impact on delivering safe patient care.

This chapter introduces the research design, study setting, sample selection, and study procedure that includes recruitment, informed consent, and data collection. Information on instrumentation for the quantitative component is included, addressing reliability and validity of the instruments. Validity related to the qualitative arm and convergent mixed method approach is also discussed. This chapter concludes with a review of Institutional Review Board (IRB) procedures and a detailed approach for data analysis for this mixed method study.

Research Design

A convergent parallel mixed methods study design was used to develop a deeper understanding of the relationship between EI and clinical reasoning in senior BSN students and how they use their emotions in clinical learning experiences. In this type of research, quantitative and qualitative strands of data were collected concurrently,

analyzed independently, and then mixed during overall interpretation to assess for convergence and divergence of data. The quantitative data provides a general explanation for the relationship between the two variables, while the qualitative component provides a more detailed understanding of EI and its relationship to clinical reasoning. A mixed methods design is valuable when there is limited prior evidence in the literature (Creswell & Plano Clark, 2011).

Study Setting

The study was conducted at a university in the Midwestern region of the United States (U.S.). The university consists of four campuses that offer a traditional and/or accelerated BSN program. Three campuses offer the traditional BSN program over the course of five semesters. Students from two of these three campuses were used for this study.

Study Population

The target population was senior BSN students enrolled in a traditional nursing program and enrolled in the final semester of the nursing program. These students had completed a variety of clinical learning experiences throughout the program for which they were able to draw upon for reflection. Additionally, these students were at the culmination of their educational curriculum, just prior to transitioning into a professional nursing role.

Study Sample

To strengthen the validity of the quantitative strand of this research study and reduce the possibility of Type II errors, or false negative findings, computing a power analysis helped determine a sufficient sample size (Polit & Beck, 2012). With bivariate

correlation situations, the conventional values of small (.10), medium (.30), and large (.50) effect sizes are used if prior estimates of effect size are unavailable (Polit & Beck, 2012). A review of the literature revealed no prior research studies investigating the relationship between EI and clinical reasoning in nursing students. A power computation for the bivariate correlation analysis was conducted using G*Power 3.1, a statistical analysis program (Faul, Erdfelder, Buchner, & Lang, 2009). To achieve a power of .80 and an estimated effect size of .30 (moderate), with a significance level, or alpha (α) of .05, the total sample size needed for the quantitative strand of this mixed methods research study was 84 participants. In convergent parallel mixed methods study design, the size of the qualitative sample may be smaller than the quantitative sample. According to Creswell and Plano Clark (2011), a smaller qualitative data set is appropriate as it seeks to develop an in-depth understanding from a few people whereas the intent of the quantitative data set is to make generalizations about a population.

Inclusion/Exclusion criteria. Eligible participants included: senior BSN students enrolled in the traditional BSN program at the chosen university in a Midwestern region of the U.S.; any gender; enrolled in the final semester of the chosen nursing program; currently in process with or completed a final clinical experience. Participants under the age of 18 were excluded due to the recommendation for the EI measurement tool to be used on ages 17 and older (Multi-Health System [MHS], Inc., n.d.).

Sampling procedures. A convenience sample of senior BSN students from one baccalaureate program was utilized for this study. With convenience samples, data is able to be collected in a shorter amount of time with participants who are willing and available for the study (Polit & Beck, 2012). Additionally, studying the entire population

of senior BSN students is impractical due to many reasons, two of which are time and funding.

Study Procedure

The study procedure followed a convergent parallel mixed methods approach (Creswell & Plano Clark, 2011). In this method, both quantitative and qualitative data were collected simultaneously from the sample.

Recruitment. Following approval from the university's IRB (see Appendix A), nursing research committee (see Appendix B), and senior level course faculty, potential participants were invited to participate in this study during their final semester of the nursing program. An on-site, official recruitment visit to each campus by the primary investigator occurred within the first four weeks of the final senior semester and during the final 15 minutes of an in-class instruction day. The visit occurred prior to to data collection. One week before the on-site visit, a recruitment announcement was posted on the electronic course management system for all final semester nursing students via the faculty member(s) teaching the chosen final semester course (see Appendix C). The faculty member(s) were utilized for this communication as the primary investigator did not have access to the students' contact information. The recruitment posting briefly described the study, logistics/timing of data collection, inclusion and exclusion criteria, instructions to bring a laptop computer, and the incentive if they chose to participate and complete the study requirements. During each on-site visit, the participant consent form was read, which included a review of information provided in the recruitment posting as well as additional detailed information about the study. Due to the small number of participants recruited at the initial visit, an additional electronic recruitment was approved

by the IRB and posted to the final semester cohort's course management system

approximately three weeks after the recruitment visits (see Appendix D).

Informed consent. The informed consent process was completed at the official

on-site recruitment visits, prior to any data collection. Each participant was provided

with the informed consent form, allowed time to review the form and ask questions, and

complete it with a signature and date. See Appendix E. Participants from the additional

electronic recruitment viewed and completed the informed consent electronically via

QuestionPro®.

Data collection. Immediately following the official on-site recruitment visits and

signage of consent forms, participants were instructed to complete the demographic form

(see Appendix F). While participants completed the demographic form, they were

provided with a handout that included the electronic links to the clinical reasoning

assessment, EI assessment, and reflection questions. This handout also included the two

reflection prompts. After completing the demographic form, participants completed the

clinical reasoning assessment using the electronic link provided. Participants were

encouraged to complete the EI assessment after the clinical reasoning assessment via the

electronic link provided. However, the EI assessment should be taken during the time of

day that works best for the participant, and when they have at least one hour of

uninterrupted time (D. Caruso, personal communication, March 15, 2017), and

participants were told that the EI assessment may also be taken at a later date at a time

that works best with their schedule. Participants were instructed to complete the

reflection prompts and EI assessment (if applicable) within one week from the on-site

recruitment visit. A follow-up/reminder email to complete the reflection prompts and EI

assessment was sent to all participants at one, three, and five days. This email reminded

participants to complete the reflection prompts and EI assessment by the deadline, as well

as the electronic links for both components (see Appendix G). For the participants from

the additional electronic recruitment, the consent and demographic form were completed

via QuestionPro® and the electronic links to the quantitative assessments and qualitative

reflection prompts were sent electronically to each participant.

Instruments

Two instruments were used to measure whether or not statistically significant

relationships existed between the quantitative data. For the qualitative component, two

reflection prompts developed from a review of the literature on EI were used.

Quantitative data. The MSCEIT (Mayer et al., 2018) was used to measure the

concept of EI. The MSCEIT is the only known tool that measures EI as an ability. The

HSRT (Insight Assessment, 2017) was used to measure the concept of clinical reasoning.

This test measures reasoning skills in addition to critical thinking, all in the context of

clinical care. The primary investigator had approval for administering both instruments.

See Appendices H and I.

Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT). The MSCEIT

(v2.0) measures how well individuals perform tasks and solve emotional problems.

Distinguished from self-report tools that measure trait EI, the MSCEIT uses the selection

of expert scoring of right or wrong answers to measure one's EI ability (Mayer et al.,

2008). In the expert scoring method, each individual's performance is compared to the

consensus of 21 international emotion experts (Mayer et al., 2018). This 141-item test

includes a total EI score, two EI area scores (*Experiential* and *Strategic*), and four EI

Ability branch scores (*Perceiving Emotion*, *Using Emotion*, *Understanding Emotion*, *Managing Emotion*) (Mayer et al., 2008). *Experiential EI* consists of *Perceiving* and *Using Emotion* whereas *Strategic EI* consists of *Understanding* and *Managing Emotion*. Each of the four branches (*Perceiving Emotion*, *Using Emotion*, *Understanding Emotion, Managing Emotion*) is measured in two tasks, with each task made up of either item parcels or individual free-standing items (Mayer, Salovey, Caruso & Sitarenios, 2003). An item parcel structure is when a respondent is shown a stimulus (an image or vignette) and asked about different emotions in a number of subsequent items based on that one image or vignette. Free-standing items involve one response per stimulus. Figure 2 provides a visual representation of the MSCEIT and its scoring.
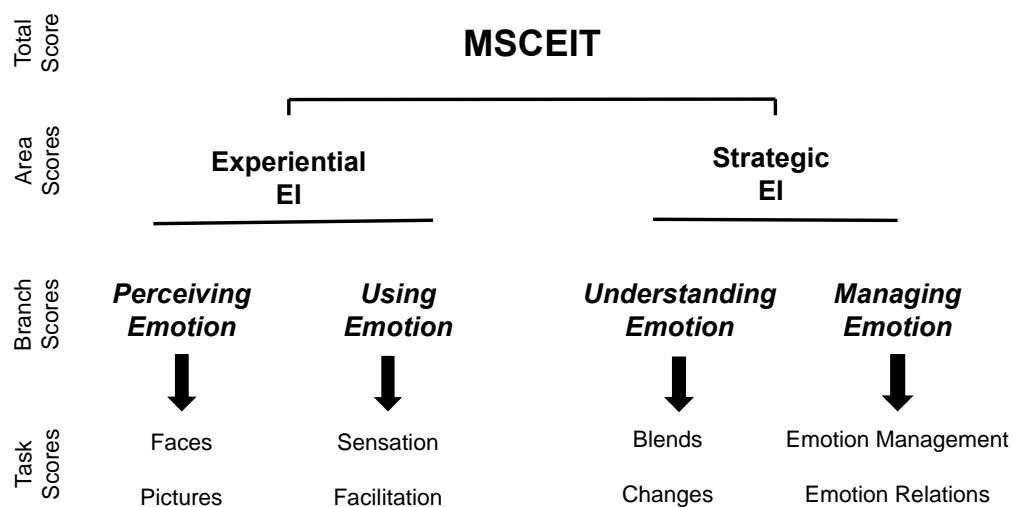
Figure 2. Overview of MSCEIT scores. From the MSCEIT certification course and adapted from the MSCEIT User Manual (Mayer et al., 2018).

Experiential EI, which consists of *Perceiving and Using Emotion*, is the ability to recognize how emotions feel and employ in through precesses (Mayer et al., 2018). *Perceiving Emotion* is the ability to perceive emotions in oneself and others and measured with the *Faces* and *Pictures* tasks. The *Faces* task consists of four item parcels with five responses each. The respondents view a series of faces for each parcel and respond using a five-point scale to indicate the degree to which specific emotion is present in the face. The *Pictures* task consists of six parcels with five responses each. In this task, rather than viewing a series of faces, respondents view landscapes and abstract designs with the response scale consisting of cartoon faces demonstrating specific emotions, rather than words. *Using Emotion* is the ability to generate, use, and feel emotion to communicate feelings or employ in cognitive processes and measured with the *Sensations* and *Facilitation* tasks. The *Sensation* task consists of five item parcels with three responses each. Respondents generate an emotion from scenarios in the five parcels and match sensations with that emotion, ranging from "not alike" to "much alike." The *Facilitation* task also consists of five item parcels with three responses each. Respondents judge the moods most useful to specific cognitive tasks and behaviors on a five-point scale ranging from "not useful" to "useful" (Mayer et al., 2003).

Strategic EI, which consists of *Understanding and Managing Emotion*, is the ability to reason about and manage emotions in situations (Mayer et al., 2018). *Understanding Emotion*, measured by the *Blends* and *Changes* tasks, involves the ability to understand how emotions combine, progress, and change through relationship transitions. The *Blends* task consists of 12 free-standing items where respondents identify emotions that can be combined to form other emotions. The *Changes* task

consists of 20 free-standing items where respondents select an emotion that results from the intensification of another feeling. *Managing Emotions*, the ability of being open to feelings and modulating them in oneself and others to promote understanding and growth, is measured by the *Emotion Management* task and *Emotional Relations* task. In both tasks, respondents use a five-point effectiveness scale ranging from "very ineffective" to "very effective" to rate actions. The *Emotion Management* task consists of vignettes about self-management, contained in five parcels with four responses each. Respondents judge actions most effective in obtaining the specific emotional outcome for an individual in the vignette. The *Emotion Relations* task consists of vignettes about managing other's emotions and contains three parcels with three responses each. In this task, respondents judge actions most effective for one person to use in the management of another person's feelings (Mayer et al., 2003).

Standard scores for the MSCEIT are transformed raw scores that have the same mean (average) of 100 and standard deviation of 15 for the total EI score, two area scores, four branch scores, and eight task scores (Mayer et al., 2018). A *Positive Negative Bias Score (PNBS)* is also reported off the transformed raw scores of the *Perceiving Emotions* branch. With a mean of 100 and standard deviation of 15, a high *PNBS* (>115) indicates a tendency to assign positive emotions to pictures, a moderate *PNBS* (85-115) indicates the assignment of both positive and negative emotions in a similar amount, and a low *PNBS* (<85) indicates a tendency to assign negative emotions (Mayer et al., 2018).

Evidence of adequate reliability and validity has been reported for the MSCEIT, and it has been used with nursing students. Reliability for the total MSCEIT score is .90,

with reliability scores for individual branch scores ranging from .76 (*Using Emotion*) to .98 (*Understanding* and *Perceiving Emotions*) (Mayer et al., 2018). In addition to the total, area, and branch scores, the *PNBS* is also reported with adequate validity and reliability. The *PNBS*, based on responses to items that are either positive (e.g., happiness, excitement) or negative (e.g., fear, sadness) in Sections A and E of the MSCEIT has an overall reliability of .87 (Mayer et al., 2018). The *PNBS* is based on a subset of the *Perceiving Emotions* ability (the *Pictures* task), which identifies whether the test taker tends to view more negative or positive emotions in pictures, independent of the actual emotions present (Mayer et al., 2018). The *Pictures* task score has a reliability of .87 (Mayer et al., 2003). The MSCEIT is scored by its publisher, MHS Assessments. Due to copyright laws, only example MSCEIT items are available at the following website: http://www.eiskillsgroup.com/msceit/.

Health Sciences Reasoning Test (HSRT). The HSRT measures clinical reasoning and assesses the skills of clinical reasoning, critical thinking, and clinical decision making in health science students and professionals (Insight Assessment, 2017). This standardized 33-item, multiple choice critical thinking test is copyrighted and can be administered in either a paper-and-pencil or web-based format. The HSRT uses vignettes from health science situations and requires responses in five areas of critical thinking: analysis, evaluation, inference, and inductive and deductive reasoning. The overall score of the HSRT indicates the strength of one's skills in making reflective, reasoned judgments. A score of > 24 is indicative of good critical thinking skills, a score of 15-24 is indicative of moderate critical thinking skills, and a score of < 15 is indicative of poor critical thinking skills.

Five additional scores of the HSRT measure specific skill dimensions of critical

thinking in health science situations and include: *analysis*, *inference*, *evaluation*,

induction, and *deduction* (Insight Assessment, 2017). *Analysis* relates to one's analytical

abilities, where people identify assumptions, reasons, and claims and examine how they

interact. *Inference* is the ability to draw conclusions from reasons and evidence, and

evaluation enables a person to assess the credibility of sources and information to judge

the quality of the analyses and inferences. These three scales include six items each. For

each scale, a score of five or higher indicates strong skills; scores of three to four indicate

moderate skills in these scales; and a score of two or less indicate weak skills in that

scale. *Induction* moves from specific to the general thinking, whereas *deduction* moves

from general thinking and culminates in specific conclusions. *Induction* occurs in

uncertain context and requires a decision to be made by drawing inferences on what is

probably true based on previous experiences or knowledge. *Deduction*, on the other

hand, consists of decision making in defined contexts and uses specific conditions such as

rules or laws. These two scales each include ten items. A score of eight or greater

indicates strong inductive and deductive reasoning abilities; scores of five to seven

indicate moderate *induction* and *deduction* reasoning abilities; and scores of four or less

indicate weak deductive and inductive reasoning abilities (Insight Assessment, 2017).

Internal consistency reliability of the HSRT was completed using the Kuder-

Richardson-20 (KR-20) calculation for dichotomous multidimensional scales. The closer

the reliability coefficient is to a value of 1.00, the more stable the measurement tool is

(Waltz, Strickland, & Lenz, 2010). Reliability of the HSRT includes the overall score

(Reliability KR-20 = 0.77-0.84) and the five separate subscales: *analysis* (Reliability KR-

20 = 0.54), *evaluation* (Reliability KR-20 = 0.77), *inference* (Reliability KR-20 = 0.52),

deduction (Reliability KR-20 = 0.71), and *induction* (Reliability KR-20 = 0.76) (Huhn,

Black, Jensen, & Deutsch, 2011). The overall score and *evaluation*, *induction*, and

deduction scales have high reliability, whereas the *analysis* and *inference* scales have

lower reliability scores, indicating less internal consistency of these scales. The HSRT is

copyright-protected and intellectual property of Insight Assessment, a division of

California Academic Press. This tool is scored by its publisher, Insight Assessment.

Publication of the items is prohibited, however information regarding the use of this

instrument can be obtained from the following website:

http://www.insightassessment.com/home.html.

    Qualitative data. Narrative pedagogy (Ironside, 2015) served as an overarching

guiding framework for creating the two reflection prompts in this study. Narrative

pedagogy is an approach where students are able to provide evidence by drawing on their

knowledge in actual clinical situations (Ironside, 2003). More than just sharing stories

and recounting experiences, Narrative pedagogy focuses on listening and responding to

practice encounters as a means to gather the collective wisdom of teachers and students

(Ironside, 2015). Guided by a qualitative expert, the reflection prompts were developed

after a review of the literature on EI. In addition to this review of literature, the Four

Branch Ability Model of EI (Mayer et al., 2004) provided a theoretical basis for this

study and specifically informed the creation of the reflection prompts.

    Reflection Prompts. The reflection prompts were collected to support or refute

the quantitative data, particularly the type of emotions present during patient care

encounters and how they are used to guide care. The reflection prompts were:

1. Tell me about a patient care encounter during a clinical learning experience and describe the emotions you experienced during that encounter.

2. Did emotions guide your care? Yes or No. Please Explain.

Threats to Reliability and Validity

Quantitative Rigor. The sample was a convenience sample and limited to senior BSN students from one accredited university in the Midwest, which limits the generalizability of the study findings. The target sample size of 84 was determined by completing a power computation for bivariate correlation analysis to have an effect size of .30. The target size was not reached; therefore, the power and effect size was calculated to reflect a pilot study. Because of a lack of literature investigating the relationship between EI and clinical reasoning in nursing students, a pilot study was more appropriate for this study to determine its feasibility for future studies (Hertzog, 2008). There is little guidance on how large a pilot study needs to be, with suggestions ranging from 10% of the sample required for a full study to no specific recommendations (Hertzog, 2008). Because of the limited number of students that participated after recruitment, it was estimated that approximately 10% of the target would be sufficient for a pilot study resulting in a lower power and large effect size. The final sample size was 16, or 19% of the initial target.

Students self-selecting to participate may have posed a threat to internal validity. According to Polit and Beck (2012), there may be pre-existing differences in those who participate versus those who do not. Additionally, some students may have chosen to complete the MSCEIT on a later day than the HSRT but still within the time period of the study. Any changes or events that happened between taking the two quantitative

instruments could have potentially impacted their scores, such as an additional clinical experience or personal experience or situation. Some students may not have participated due to the length of the surveys. The MSCEIT takes 30-60 minutes and the HSRT takes 30-45 minutes to complete. Threats to construct validity included the measurement tools (Polit & Beck, 2012). For this study, the HSRT was used for the measurement of clinical reasoning. The HSRT (Facione & Facione, 2006) measures clinical reasoning, critical thinking, and clinical-decision making in a health-clinical context, but not specific to nursing. The MSCEIT measured the construct of EI as an ability. Both instruments have demonstrated acceptable validity and reliability for use.

Qualitative Rigor. Potential threats to the validity in the qualitative strand of this study included the patient's answers to the reflection prompts and the researcher's analysis of the responses. To develop a comprehensive understanding and enhance trustworthiness of the data, triangulation was used throughout the qualitative arm. During triangulation, evidence for coding of categories was drawn from several individuals participating in the study.

The trustworthiness of qualitative research relates to four criteria: 1) credibility, 2) transferability, 3) dependability, and 4) confirmability (Thomas & Magilvy, 2011). All four criteria were followed throughout the qualitative arm to enhance the trustworthiness of the research. To achieve credibility, data as a whole is checked for representativeness by using strategies such as reflexivity, member checking, and peer or consultant examination (Thomas & Magilvy, 2011). To maintain credibility and avoid researcher bias, a reflexive process was followed throughout the review of transcripts and during the creation of categories that included acknowledging preconceived ideas or notations. This

reflexive process was completed in consultation with an experienced qualitative research expert. Transferability is thoroughly describing the study methods in order for potential study replication (Thomas & Magilvy, 2011). Transferability was maintained by providing a description of the population studied as well as the study methods, which details sampling procedures, data collection, and the analysis process. Dependability in qualitative research is achieved when a decision trail is maintained by the researcher (Thomas & Magilvy, 2011). A qualitative analysis journal trail and conversations with a qualitative expert provided dependability for this study. Confirmability of the qualitative categories was able to be attained by the established credibility, transferability, and dependability methods described.

Confidentiality, Informed Consent, and Protection of Human Subjects

Data and participant anonymity and confidentiality was assured by following ethical research procedures throughout this study. The university's IRB and nursing research committee reviewed and approved the protocol for this study, informed consent, and proposed instruments. To maintain confidentiality throughout the research process, the primary investigator de-identified all personal information from the demographic form, MSCEIT, HSRT, and reflection prompts and assigned identification numbers to participants for the data analysis. The data was maintained on the primary investigator's password protected laptop and only the primary investigator and committee members had access to data collected.

The informed consent process was followed and included a brief description of the study, potential risks and benefits to participating in the study, and assurance of confidentiality throughout the study. The participants had the opportunity to read the

informed consent, ask questions about the study, consider whether or not they wish to participate, and then sign and date the consent form (see Appendix E). All participants received a copy of the consent form for their reference.

The primary investigator was certified in the Collaborative Institutional Training Initiative (CITI) Program on Human Subjects Research (see Appendix J). The participants were notified that participation was voluntary and that they were able to withdraw from the study at any time without any repercussions. The primary investigator was not associated with the baccalaureate program. The participants were informed that there were no known risks to participating in the study. However, students were provided with contact information for university counseling services if completing the MSCEIT or reflecting on emotions during clinical experiences evoked any strong feelings that they would like to process further. Incentives for participating in this study included being entered in a drawing for one of three $50 Amazon gift cards on each campus. Participants were told that they needed to complete all three components of the study (HSRT, MSCEIT, and reflection prompts) to be eligible for the drawing of the gift card. In addition to the gift card drawing, light snacks were provided to the participants during the on-site recruitment visit.

Data Analysis

The data analysis followed the seven-step process for a convergent mixed methods design laid out by Creswell and Plano Clark (2011), specifically merging data analysis from both the quantitative and qualitative components to compare results. Step one consisted of concurrent collection of both quantitative and qualitative data. Once completed, the PI moved on to step two, which consisted of analyzing the quantitative

and qualitative data independently. Steps three through six related to the process of

merging data for comparisons and in step seven, the combined analyses were interpreted

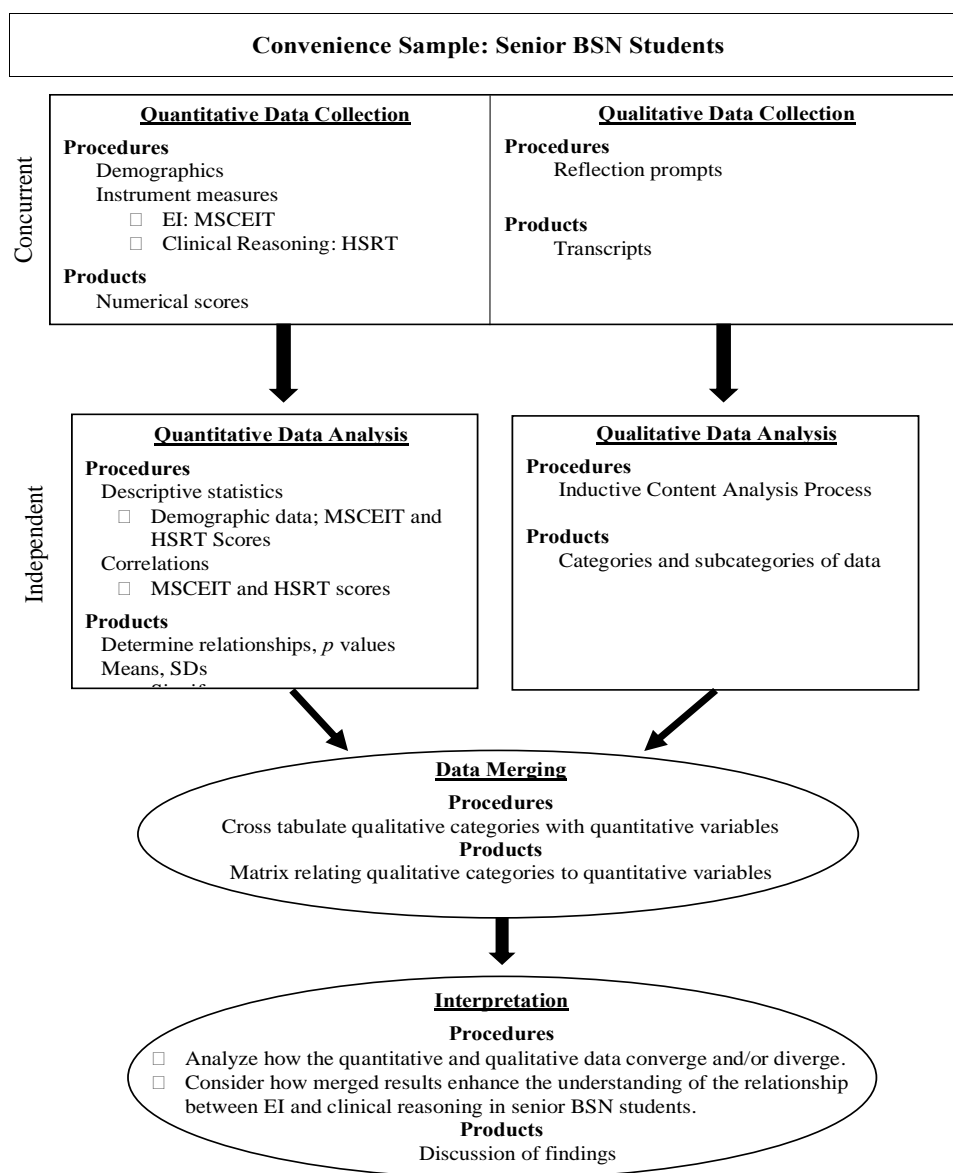in relation to the research questions. See Figure 3.

Figure 3. The convergent parallel mixed methods steps used for data analysis. Adapted

for study from Creswell and Plano Clark (2011).

Quantitative strand analysis. The quantitative analysis answered research question one: What is the relationship between EI and clinical reasoning in senior BSN students? All raw data (demographics, MSCEIT scores, HSRT scores) were combined on an Excel® spreadsheet and uploaded into International Business Machines (IBM) Statistical Package for Social Sciences (SPSS) version 25 for statistical analyses. After the data was cleaned, descriptive statistics were computed for the demographic data, the MSCEIT (total EI; EI area scores: *Experiential EI* & *Strategic EI*: EI branch scores: *Perceiving*, *Using*, *Understanding*, and *Managing Emotions*; and the *PNBS*), and the HSRT (overall clinical reasoning score and scales scores: *analysis*, *evaluation*, *inference*, *induction*, *deduction*). Bivariate correlational statistics were computed to assess relationships between MSCEIT and HSRT scores. Interpretation of the data was based on the presence of a positive or negative relationship between variables as well as the strength of that relationship ($p = < 0.05$).

Qualitative strand analysis. The qualitative analysis answered research question two: What emotions do senior BSN students describe experiencing in patient care encounters during clinical learning experiences?; and research question three: How do senior BSN students describe using their emotions to guide care during clinical learning experiences? Open-ended responses from the question prompts were collected via QuestionPro® for analysis. In consultation with a qualitative expert, categories were created from the qualitative reflections using an inductive content analysis approach. This approach consisted of categorizing data from specific to general and it is appropriate when previous studies related to the phenomena are either fragmented or non-existent (Elo & Kyngäs, 2008). A deductive content analysis approach categorizes data from

general to specific and used when analysis is based on previous knowledge to test a theory (Elo & Kyngäs, 2008). Because the majority of evidence in the literature focuses on the concepts of EI and clinical reasoning separately and never in relation to one another, an inductive content analysis process was appropriate for the qualitative arm of this study.

The inductive qualitative content analysis process occurred in three phases: preparation, organizing, and reporting (Elo & Kyngäs, 2008). In the preparation phase, the written responses to the reflection prompts were read through several times by the primary investigator. After preparing the written responses, the data was organized using an inductive approach, which included open coding, creation of categories, and abstraction of the written responses (Elo & Kyngäs, 2008). Once the organizing phase was complete, the categories were defined to be consistent with the process as described by Elo and Kyngäs (2008). Authentic citations were used to point out from where and what kinds of original data categories are formulated. All participant reflections were reviewed and analyzed in order to enhance the quality of findings.

Merging data and interpretation. The final steps of the data analysis included merging the data for interpretation. Data was merged and interpreted to answer research question four: In what ways, if any, do the qualitative results from the reflection prompts on emotions in clinical learning experiences relate to the quantitative results on the relationship between EI and clinical reasoning in senior BSN students? The two databases were merged by comparing the quantitative and qualitative data sets. The qualitative categories were compared with the findings of quantitative descriptive and

bivariate statistics. Lastly, the combined results were interpreted and synthesized to answer the quantitative, qualitative, and mixed methods research questions.

Missing data. Listwise deletion was used to remove cases from the data analysis for those participants who failed to complete either of the quantitative instruments or either instrument in its entirety. Completing both quantitative instruments was required to effectively answer the research questions and limit bias. Three participants failed to complete the MSCEIT and were excluded from the data analysis for this study. These participants also did not complete the reflection prompts. The likelihood of missing data values at random from the MSCEIT were low, because this instrument required participants to answer the question at hand before being allowed to move on to subsequent questions. However, the HSRT allowed participants to move around within the instrument and the likelihood of missing data values at random was higher. If individual data values were found to be missing from an instrument, the maximum likelihood estimation (MLE) process would have been used to compute values for this component. The MLE process consists of using all data points in the dataset to construct an unbiased estimated replacement value for the missing value (Polit & Beck, 2012). No missing data points were found in either of the quantitative instruments used for data analysis. Participants who completed both instruments but failed to complete the qualitative reflection prompts would have still been included in the quantitative data analysis, resulting in a larger quantitative sample. According to Creswell and Plano Clark (2011), having the qualitative sample much smaller than the quantitative sample is an appropriate option in mixed methods research and allows for the generalization of the quantitative data while developing an in-depth understanding from less people in the

qualitative data. All participants who completed both instruments completed the

reflection prompts.

Chapter 4: Results

The purpose of this study was to explore the EI of senior BSN students and its relationship to clinical reasoning to gain a better understanding of how emotions are used in clinical learning experiences. This study was a convergent parallel mixed methods study where quantitative and qualitative data were collected simultaneously, analyzed separately, then merged together for analysis.

This chapter is divided into three sections. The first section provides descriptive statistics, including demographic information and a descriptive summary of each quantitative assessment tool. The second section is further organized by research question and describes the findings of this study. Research question one provides the quantitative data for this study. Research questions two and three provide the qualitative data for this study. The third section describes the process of merging the quantitative and qualitative results for the mixed methods analysis, or research question four.

Results

For quantitative data, demographic and raw survey scores were manually entered into an Excel® spreadsheet for each participant. The data was verified, coded for de-identification, and made password protected. Data cleaning and analysis was completed in SPSS version 25 (IBM, 2017). An independent statistician was used to verify the quantitative process and results.

Descriptive Statistics

Demographic information. A total of 97 final semester senior nursing students were invited to participate in this study. Nineteen (19.6%) completed the informed consent, demographics sheet, and HSRT. Of these participants, 16 completed the

additional study components (MSCEIT and reflection questions). The three participants

who did not complete the MSCEIT were excluded from the data analysis via listwise

deletion. The final sample size for this pilot study was 16, resulting in a 16.5% response

rate.

All participants were between the ages of 21 - 28, with a mean age of 23.06 (SD =

2.489). The range of self-reported GPA on a 4.0 scale for participants was 3.0 - 3.96,

with a mean of 3.56 (SD = 0.342). Of the 16 participants, 81.3% were female and all

identified their ethnicity as white (100%). One participant (6.3%) had repeated a nursing

course at some point in his or her program of study and two participants (12.5%) had

previous degrees, specifically the Associates of Applied Science degree (see Table 1).

Table 1.

Demographic Distribution of Sample

		n	%
Gender	Male	3	18.8%
	Female	13	81.3%
Ethnicity	Asian/Pacific Islander	0	0%
	Black or African American	0	0%
	Hispanic or Latino	0	0%
	Native American or American Indian	0	0%
	White	16	100%
	Other or Prefer Not to Identify	0	0%
Repeat Nursing Course	Yes	1	6.3%
	No	15	93.8%
Previous Degree	Yes	2	12.5%
	No	14	87.5%

Note. N = 16

MSCEIT. Total EI, two area scores (*Experiential*, *Strategic*), four branch scores (*Perceiving*, *Using*, *Understanding*, *Managing*), and the *PNBS* were analyzed. Scoring descriptors for the MSCEIT (total EI, area scores, branch scores) are listed in Table 2.

Table 2.

MSCEIT Expert Scoring Descriptors

	Score
Improve	50 - 70
Consider Developing	70 - 90
Competent	90 - 110
Skilled	110 - 130
Expert	130 - 150

Note. Each score Mean = 100 (SD = 15)

Participant scores generally fell into the middle three categories ("Consider Developing", "Competent", and "Skilled"). The majority of participants (87.5%) scored in the "Competent" range or higher for total EI. Only two participants (12.5%) scored at the "Consider Developing" level. Opposite to this, two participants (12.5%) scored in the "Expert" range (see Figure 4). Findings were similar in the area (see Figure 5) and branch scores (see Figure 6), with the exception of the *Using Emotions* branch. While over half of the participants scored in the "Competent" range or higher in the *Using* branch, six participants scored below "Competent" in the "Consider Developing" range.
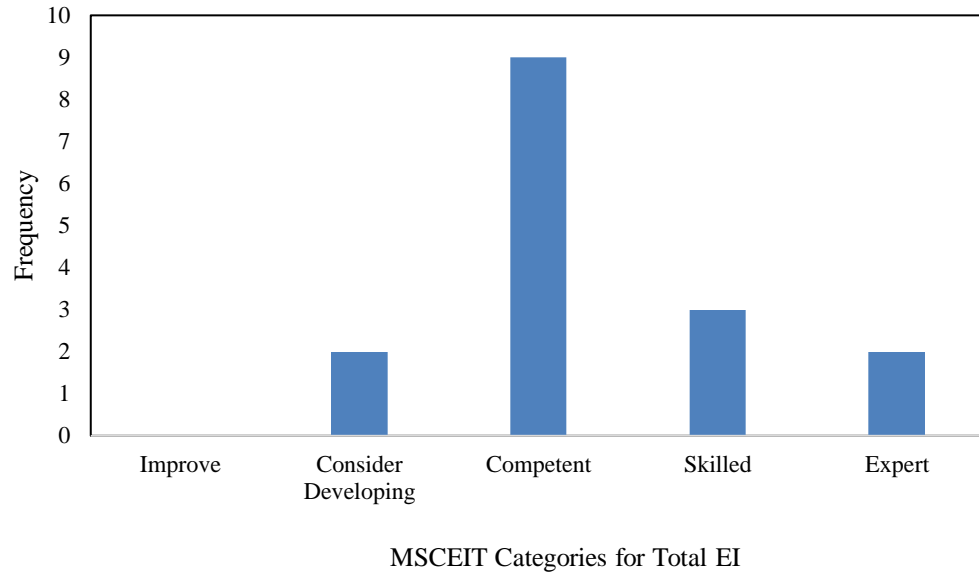
Figure 4. Representation of the total EI scores in bar graph format.
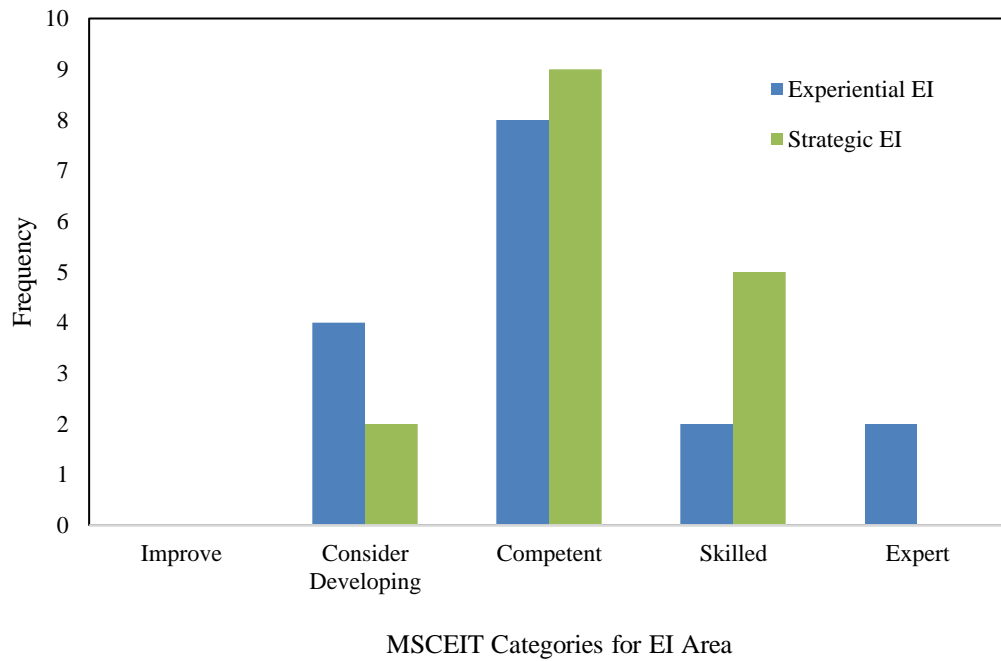
Figure 5. Representation of the EI area scores in bar graph format.
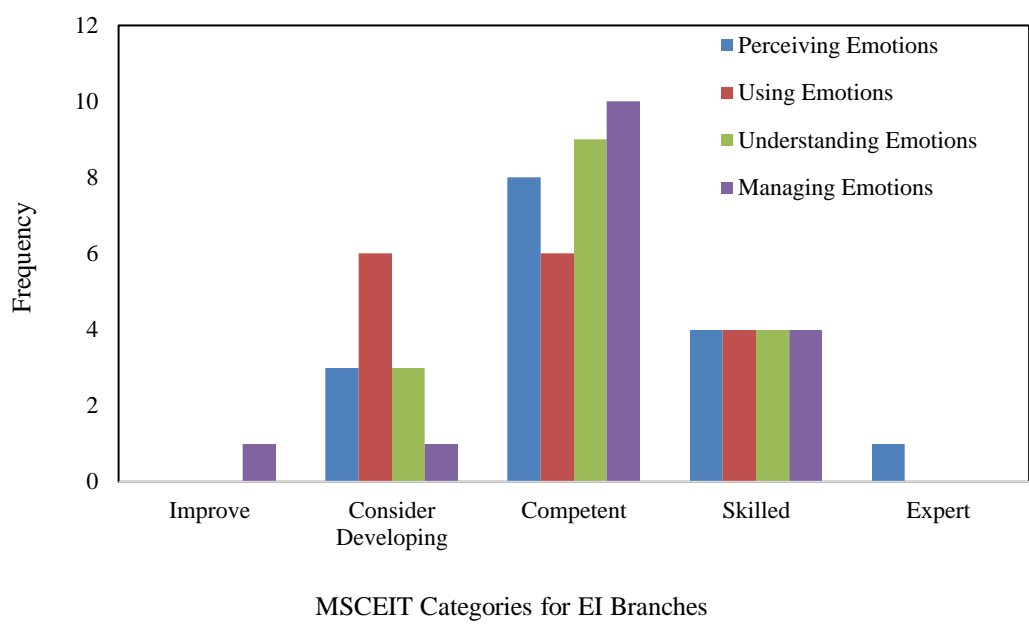
Figure 6. Representation of the EI branch scores in bar graph format.

The means for total EI and all subscores were in the "Competent" range (90-110). The total EI mean score for participants was 103.32 (SD = 16.977). The mean EI area scores (*Experiential EI*, *Strategic EI*) and branch scores (*Perceiving Emotions*, *Using Emotions*, *Understanding Emotions*, *Managing Emotions*) were also in the "Competent" range. Table 3 provides an overview of the mean scores for all MSCEIT components as well as the range of scores.

Table 3.

MSCEIT Mean Scores

	M	SD	Range
MSCEIT Total	103.32	16.977	72.86 – 133.59
Experiential EI	103.15	16.938	82.11 – 140.1
Perceiving	103.81	16.769	77.29 – 141.21
Using	100.33	15.322	78.39 – 124.70
Strategic EI	102.84	13.358	71.02 – 116.36
Understanding	102.56	11.441	81.60 – 117.39
Managing	101.31	15.277	59.25 – 119.42
PNBS	100.65	9.006	88.16 – 121.58

Note. M = Mean, SD = Standard Deviation

A high *PNBS* (> 115) indicates the assignment of positive emotions to pictures in the MSCEIT. Conversely, a low *PNBS* (<85) indicates the assigning of negative emotions to pictures. The mean participant score for *PNBS* fell between these two values (100.65), indicating the majority of participants assigned both positive and negative emotions in a similar amount. Two participants (12.5%) had a score greater than 115 indicting a positive bias, or the assignment of more positive emotions to pictures. Zero participants had a score less than 85, or a negative bias.

HSRT. Scoring descriptors for the HSRT are listed in Table 4.

Table 4.

HSRT Scoring Descriptors

	Maximum	Score
Overall	33	> 24 = good
		15-24 = moderate
		< 15 = poor
Induction	10	8 or > = strong
Deduction		5-7 = moderate
		4 or < = weak
Analysis	6	5 or > = strong
Inference		3 – 4 = moderate
Evaluation		2 or < = weak

Participant scores generally fell into the "moderate" range for overall clinical

reasoning. Only one participant (6.3%) scored in the "poor" range while seven (43.8%)

scored in the "good" range (see Figure 7). In the clinical reasoning scales, the majority of

students scored "strong" in *induction*, *deduction*, and *evaluation*. In *analysis* and

inference, the majority of the students scored "moderate" to "weak" (see Figure 8).
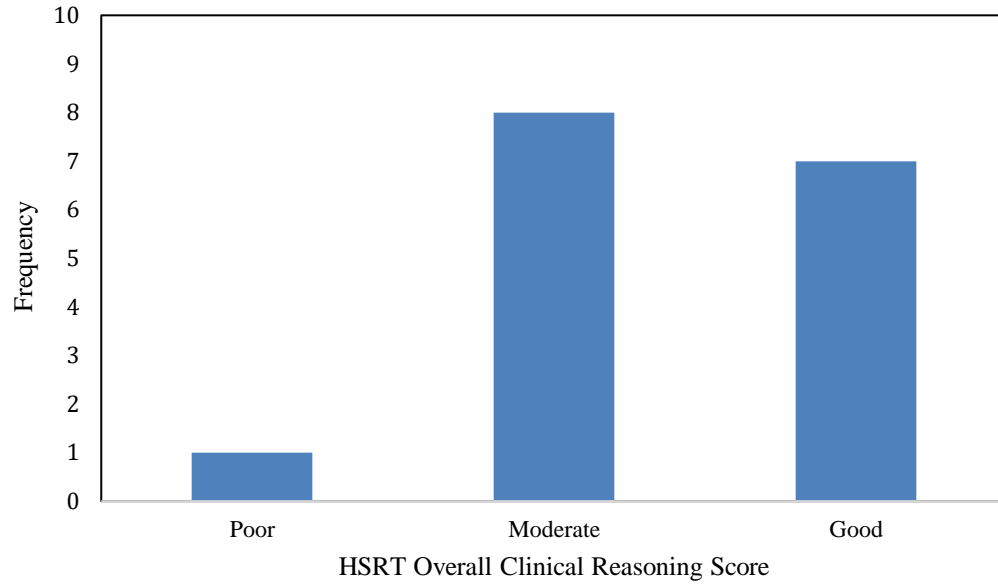
Figure 7. Representation of the overall clinical reasoning scores in bar graph format.
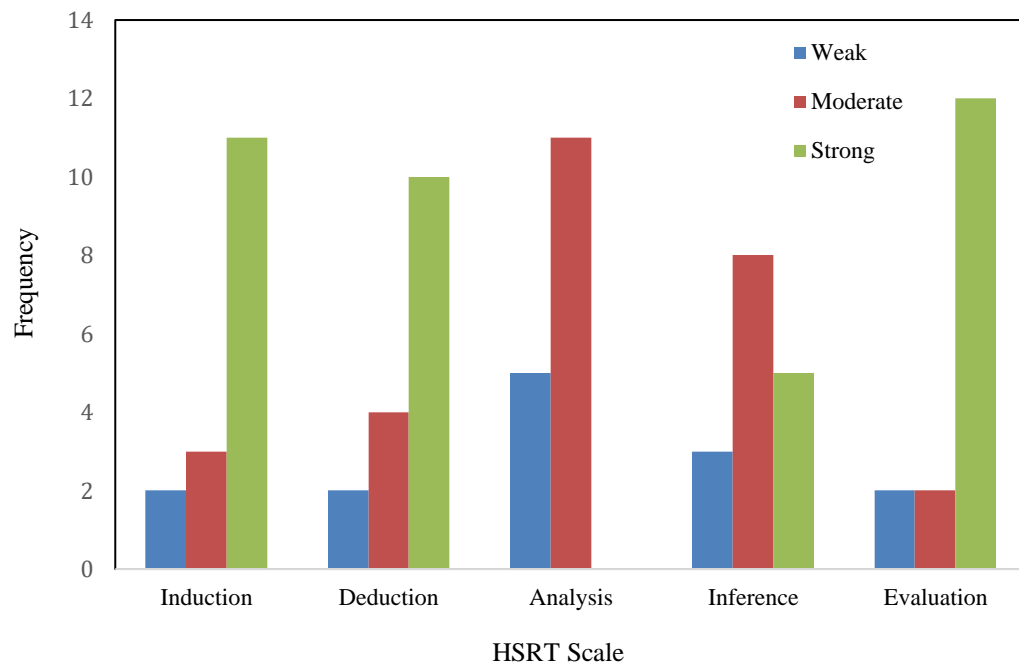
Figure 8. Representation of the clinical reasoning scale scores in bar graph format.

The mean overall clinical reasoning score for participants was 22.88 (SD = 4.334), indicating overall clinical reasoning scores in the "moderate" skills range. The mean HSRT scales (*induction*, *deduction*, *analysis*, *inference*, *evaluation*) were also in the "moderate" skills range. Table 5 provides an overview of the mean scores for the HSRT as well as the range of scores.

Table 5.

HSRT Mean Scores

	M	SD	Range
HSRT Overall	22.88	4.334	11-27
Induction	7.31	1.662	3-9
Deduction	7.44	2.337	1-10
Analysis	4.81	0.834	3-6
Inference	3.88	1.544	0-6
Evaluation	4.75	1.438	1-6

Note. M = Mean, SD = Standard Deviation

Analysis of Research Questions

Quantitative analysis. The quantitative analysis answered research question one: What is the relationship between EI and clinical reasoning in senior BSN students? The hypothesis for this research question was as follows: Senior BSN students who score higher in total EI, EI areas, and EI branches will also score higher in overall clinical reasoning and its individual scales.

The initial analysis included the Shapiro-Wilk test for normality of the dependent variables to determine appropriateness for bivariate correlation statistical analysis. For all statistical analyses, the level of significance was $p < 0.05$ using two-tailed tests. The Shapiro Wilk test demonstrated *p*-values less than 0.05 in eight of the 13 scores,

indicating non-normal distribution. Because of this finding, non-parametric statistical

analysis was appropriate. Table 6 illustrates the results of the normality testing.

Table 6.

Shapiro-Wilk Test of Normality on Dependent Variables

Variable	W	*p*-value
MSCEIT Scores		
Total MSCEIT	.966	.772
Experiential	.911	.123
Strategic	.877	.035*
Perceiving	.959	.643
Using	.929	.232
Understanding	.933	.269
Managing	.877	.035*
PNBS	.878	.036*
HSRT Scores		
Overall	.830	.007*
Induction	.736	.000*
Deduction	.852	.014*
Analysis	.872	.029*
Inference	.889	.054
Evaluation	.769	.001*

* Significant at the 0.05 level.
Note. Reject the null hypothesis, indicating non-normal distribution.

Statistical analysis was performed utilizing Spearman's rank correlation

coefficient, or Spearman's Rho. According to Polit and Beck (2012), Spearman's Rho is

used to demonstrate a linear relationship between two variables for non-parametric

statistical analysis. Spearman's Rho identified the strength and direction of the

relationship between MSCEIT scores and HSRT scores. The significance, or *p* value, for

analyses was set at 0.05. The total EI score was correlated with the overall clinical

reasoning score and its five scales (*induction*, *deduction*, *analysis*, *inference*, *evaluation*).

The data revealed no statistically significant findings between total EI score and the overall clinical reasoning score (r_s = .291, p = .274). In addition, there were no statistically significant findings between total EI and any of the five scales of clinical reasoning (r_s ranged from .231-.297, p values ranged from .264-.389). Table 7 demonstrates the results of the analysis.

Table 7.

Results: Total EI with Overall Clinical Reasoning and Scales

	Total EI	
	r_s	p
Overall Clinical Reasoning	.291	.274
Induction	.297	.264
Deduction	.277	.299
Analysis	.242	.367
Inference	.239	.372
Evaluation	.231	.389

*Significant at the 0.05 level (two-tailed)
Note. r_s = Spearman's rho, p = significance level

The EI area scores (*Experiential*, *Strategic*) and branch scores (*Perceiving*, *Using*, *Understanding*, *Managing*) were correlated with the overall clinical reasoning score and its individual scales. No statistically significant findings were found between *Experiential EI* and the overall clinical reasoning score (r_s = .221, p = .410), or any of the clinical reasoning scales (r_s ranged from .128-.289, p values ranged from .278-.637). Similarly, there were no significant findings between the Experiential branches (*Perceiving*, *Using*) and overall clinical reasoning or its scales. Although greater than the .05 significance level, the *Strategic EI* area was trending towards a significant positive correlation with overall clinical reasoning (r_s = .489, p = .055) and its scale of *induction*

(r_s = .464, p = .070). Small sample sizes may not have enough power to detect a 5% significance level; therefore, small p-values greater than .05 need be analyzed carefully as there may not be enough evidence to reject the null hypothesis (Dorey, 2010). A significant moderate positive correlation was found between *Strategic EI* area and the clinical reasoning scale of *inference* (r_s = .509, *p*= .044), indicating higher Strategic EI was positively correlated with higher inference skills. Significant moderate positive correlations were also found between the *Understanding* branch of EI and overall clinical reasoning (r_s = .559, p = .024) and the scale of *induction* (r_s = .530, p = .035). The *Understanding* branch was also trending towards significance with the clinical reasoning scale of *inference* (r_s = .460, p = .073) and *evaluation* (r_s = .478, p = .061). Table 8 demonstrates the results of the analysis. Figures 9 and 10 demonstrate graphical representations of the significant relationships found.

Table 8.

Results: EI Areas and Branches with Overall Clinical Reasoning and Scales

	EI Area Experiential	EI Branch Perceiving	EI Branch Using	EI Area Strategic	EI Branch Under-standing	EI Branch Managing
	r_s (p)					
Overall	.221 (.410)	.131 (.630)	.027 (.922)	.489 (.055)	.559* (.024)	.169 (.531)
Induction	.206 (.444)	.140 (.606)	.205 (.447)	.464 (.070)	.530* (.035)	.109 (.688)
Deduction	.289 (.278)	.186 (.492)	.015 (.956)	.361 (.170)	.424 (.102)	.154 (.569)
Analysis	.253 (.345)	.318 (.230)	-.347 (.189)	.389 (.136)	.346 (.102)	.334 (.206)
Inference	.128 (.637)	.026 (.923)	-.011 (.968)	.509* (.044)	.460 (.073)	.373 (.154)
Evaluation	.242 (.366)	.166 (.540)	.223 (.406)	.269 (.314)	.478 (.061)	-.098 (.717)

*Significant at the 0.05 level (two-tailed)
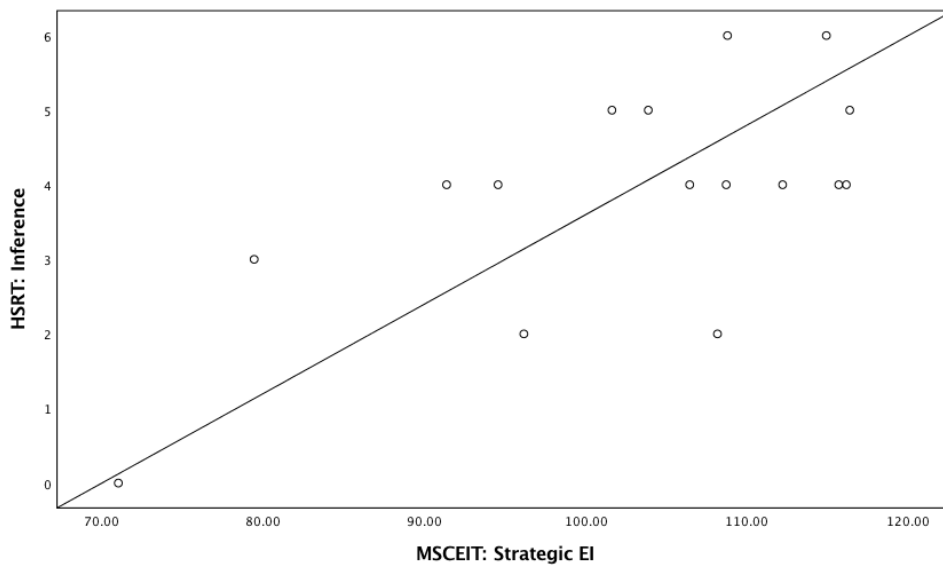*Note*. r_s = Spearman's rho, p = significance level

Figure 9. Scatterplot demonstrating correlation of *Strategic EI* area and *inference*.
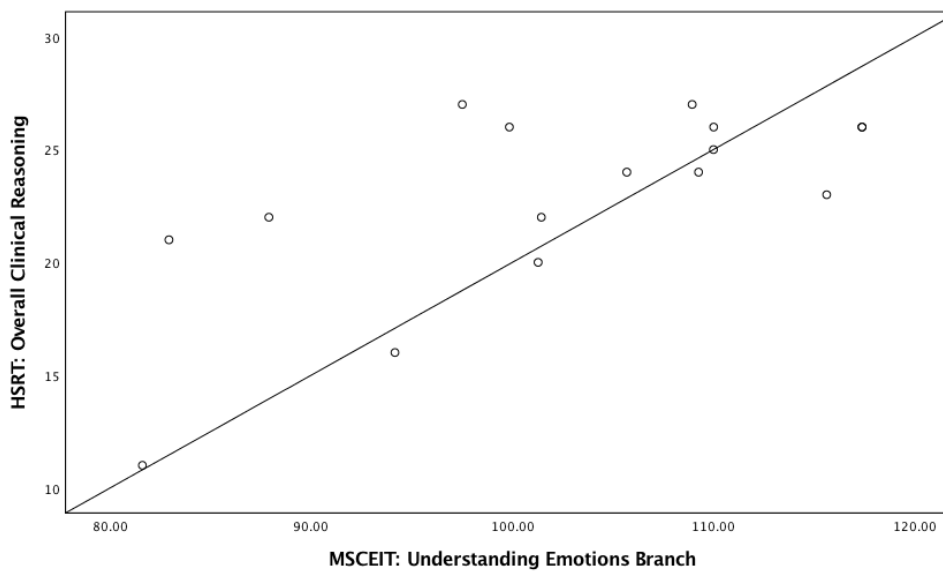
Figure 10. Scatterplot demonstrating correlation of *Understanding Emotions* branch and overall clinical reasoning.

The *PNBS* was also analyzed for its relationship to clinical reasoning. No

statistically significant relationships were found between the *PNBS* and the overall

clinical reasoning score (r_s = .436, p = .091) or the clinical reasoning scales. See Table 9.

Table 9.

Results: PNBS with Overall Clinical Reasoning and Scales

	PNBS	
	r_s	p
Overall Clinical Reasoning	.436	.091
Induction	.292	.273
Deduction	.379	.148
Analysis	.192	.477
Inference	.380	.147
Evaluation	.211	.433

*Significant at the 0.05 level (two-tailed)
Note. r_s = Spearman's rho, p = significance level

The hypothesis for research question one was partially supported. While there

were no significant correlations between total EI and overall clinical reasoning, a

significant positive correlation was found between Strategic EI area and the clinical

reasoning scale of *inference*. Significant positive correlations were also found between

the *Understanding emotions* branch of EI, which is a component of Strategic EI, and

overall clinical reasoning and its scale of *induction*. No correlations were found between

the *Experiential EI* area or the *Perceiving*, *Using*, or *Managing emotions* branches and

clinical reasoning or its scales.

Qualitative Analysis. To answer research questions two and three, senior BSN

students were asked to respond to the following open-ended prompts: (1) Tell me about a

patient care encounter during a clinical learning experience and describe the emotions

you experienced during that encounter; (2) Did emotions guide your care? Yes or No. Please Explain.

Qualitative analysis began by first downloading the text responses from QuestionPro® into Microsoft Word®. The text was organized into two columns (research question two, research question three), leveled by participant identification number, and printed for a content analysis. The responses were analyzed together to tell the story as a whole. The aim of the content analysis was to describe the phenomenon broadly through concepts or categories (Elo & Kyngäs, 2008). Elo and Kyngäs's (2008) content analysis method incorporating an inductive approach was used, where general categories were created from the specific individual responses. In the preparation phase, the full narratives were read and re-read three times without making comments or notations. After the preparation phase, the qualitative data was organized through an open coding system. Organization of data included writing notes and headings within the printed text and margins while reading the individual responses through many times. These notes and headings were grouped to create specific categories to describe the phenomenon. The categories identified were reviewed, discussed, and finalized with a qualitative expert who also followed this same process.

The qualitative findings are these senior BSN students' personal descriptions of their emotions in clinical learning experiences. Analysis of their responses revealed three categories related to the emotions experienced and how those emotions were used in patient care encounters: 1) Sadness for…, 2) Shifting emotions, and 3) Presence.

Sadness for… . Overwhelmingly, the stories students elected to share tended to be about critically ill patients. Often, the first emotion identified in student reflections

was one of sadness, not for themselves, but for the patient, the family member(s), and/or the overall situation. One student described this collective sadness with the following:

A patient encounter I had with a patient who was going to die due to multiple organ failures elicited many emotions from myself. Obviously sadness and experiencing the sadness of family members who felt lost and unsure of what to do. Also just a sense of understanding that life is so short and feeling lucky that I am who I am.

Most student reflections did not integrate all three components; however, a sadness for the patient and their situation was commonly shared. One student wrote specifically about feeling sadness for a patient who had just given birth. According to the student, the newborn was having trouble with thermoregulation and maintaining blood glucose levels. This resulted in having to transfer the newborn to the Neonatal Intensive Care Unit. This student wrote:

My nurse and I had to inform the mother of this circumstance and ask her to say goodbye to her newborn. The emotions I experienced were empathy and sadness for her.

Student narratives also described a sadness for family members or loved ones. One student told about a clinical experience that involved talking with a family whose mother was in the Intensive Care Unit and severely ill, reflecting:

… how hard it was to sit there and hear their questions about what are signs if she improves and it was a sad time but I knew that when coming into nursing that I would have to handle situations like this.

These student narratives recognized the existence of sad emotions; however, they also acknowledged that the sad emotions did not overwhelm them and were managed in order to provide care.

Shifting emotions. While many students began by describing their initial emotion as sadness, they would then tell about a shifting, or changing of emotions throughout the encounter. For example, *"I was sad that she didn't have anyone there to share her experience with, but glad she didn't seem to be taking it too hard."* In several responses, students' narratives revealed more than one emotion was elicited within a specific patient encounter. One student shared:

I felt bad for this patient, as her refusal to take her medications was causing confusion and altered mood. I also felt frustrated, as her mood towards us was hostile and cold, even though we were only trying to help her. Lastly, I felt helpless, as she continued to refuse taking the med that would help her remain on the liver transplant list.

In addition to identifying emotions *during* patient encounters, students also described emotions *after* the patient encounter ended.

"... I came to feel remorse for the things I took for granted and the little difference I could have in this man's life.…My emotions following this experience were personal contentment and joy to see him smile."

Another student described: *"I felt sadness because she was sad, love because I deeply wanted to help her and care for her, and pride because I was proud of how I handled it."*

Students explained that they were able to identify their emotions and how they did not let those emotions negatively impact the quality of care provided. For example, one

student described this shifting of emotions in regards to a septic patient that had a history of hospitalizations for poor health habits:

> *I felt angry because he was responsible for all of his life choices that had lead* [sic] *him to this situation. I also felt very sad for him because he did not have any family or support to help him get through this trying time…I was very upset with him for his life choices but I cared for him like I would any patient…*

The mixture of emotions described in the students' narratives extended from sadness to joy. In addition to this array of emotions, students detailed the flux of these different emotions in crucial situations indicating a high level of maturity.

Presence. The multitude of emotions described were used in the context of sharing time and space to promote healing for patients and the patients' loved ones. Students' reflections emulated the ability to be with their patients in ways that went beyond just providing physical care. For instance, one student's experience that was recalled was with a patient who required two intravenous lines to be started because of a gastrointestinal bleed exemplified presence. This student wrote:

> *The patient was very confused and combative as we explained that we were going to start an IV, so we attempted to orient him to the correct time and place. While a nurse held his hand, I inserted an IV in his forearm, but I felt sad and guilty about needing to keep him still without him being fully aware and able to consent. But the patient would occasionally sing songs, a self-soothing act, while we were in the room with him. It seemed to give him moments of lucidity. When the other nursing student went to start his second IV, I asked the patient to sing another song with me, and he became calm enough for the IV insertion. I felt more*

connected to him and more at peace about starting the second IV when he was

calm and singing…

Another detailed a time when he/she stayed after a shift was over to shave a

patient, sharing, *"I could have easily set aside my emotions and left because my shift was*

over." One student reflected on using his or her emotions to spend time with a patient by

sharing, *"...made me take the extra time to be with her. I did not rush her and I listened*

closely." Students also wrote about what happened during their actual time spent with

patients with this student sharing, *"... I tried to understand how the separation was*

affecting her personally by being attentive to her body language and any side

comments."

Students described using their emotions to facilitate healing and bring comfort to

their patients. A few students shared:

> *"...even if I can't make him heal right away I was hopefully able to make him feel*
> *better for those 8 hours."*
>
> *"I tried to comfort the family after and make sure they got whatever they needed*
> *in this tough time."*
>
> *"I felt empathetic that she was along and most likely scared and wanted to do*
> *what I could to make her feel better."*

EI is the ability to engage in information processing about one's own and other's

emotions and to use this information to guide thinking and action (Mayer, Salovey, &

Caruso, 2008). The concept of EI in these senior BSN students' qualitative responses is

portrayed by the three categories of sadness for…, shifting emotions, and presence. One

student's narrative captures all three categories by detailing the feelings experienced in

the beginning of the encounter, how emotions were worked through or changed, and then used in the process of providing care. This participant explained his or her experience when caring for a group of minors involved in a motor vehicle accident:

> *I felt very powerful emotions all at once, starting with sadness. I was sad that these kids have their whole lives ahead of them and something that was supposed to be a fun time turned dangerous. I then felt sadness for the victims of the accident and then guilty. I felt guilty that I take such simple things for granted while these kids won't ever get to say goodbye to the friends they lost. I also felt happiness because when I wheeled the patient into the room, the other patient made a hand gesture that made both families laugh and cry. It was a bittersweet moment for sure, but afterward, both families thanked myself and the nurse I was with for bringing those two together and stressed how important it was for everyone involved.*

Converging the Quantitative and Qualitative Results: Mixed Methods Analysis

The fourth and final research question investigated how the qualitative results from the reflection prompts related to the quantitative results on the relationship between EI and clinical reasoning in senior BSN students. The analytic strategy for this research question included merging the quantitative and qualitative findings to determine if there was convergence or divergence of the data. The categories from the qualitative component of this study were investigated for a relationship to the bivariate correlational findings between EI and clinical reasoning, as well as with the descriptive findings from the MSCEIT. After merging the data, results converged and revealed a deeper

understanding of EI and its relationship to clinical reasoning in these senior BSN students. The findings are further discussed.

The qualitative category of presence possibly provides some further explanation on the relationship between EI and clinical reasoning. The narratives from this category suggest that students used their emotions to be with their patients physically and emotionally during clinical learning experiences. While no statistically significant relationship was found between total EI and overall clinical reasoning, a significant positive correlation was identified between the *Strategic EI* area and the clinical reasoning scale of *inference*. The *Understanding* branch was also found to be significantly correlated with overall clinical reasoning and it scale of *induction*. This data was supported through the narrative texts, in which students described how emotions were used in order to be present with patients. At times, aspects of clinical reasoning were inherent in the reflections of how emotions were used to guide care. One student's narrative captures the relationship between *Strategic EI* and clinical reasoning by describing the ability to think through emotional data while integrating aspects related to the clinical reasoning scales of *induction* and *inference*.

> *Emotions guided my care in how I approached the patient and talked with her. I did not provide extra or more personal care compared to how I treat my other patients… I tried to understand how the separation was affecting her personally by being attentive to her body language and any side comments.*

Students did not specifically identify clinical reasoning concepts in their written responses; however, one student particularly pulled out inference sharing:

"Emotions guided the quality of care… Being aware of my emotions and making inferences about what he was going through allowed me to provide better care, I think."

The qualitative themes sadness for… and shifting emotions augment the descriptive EI score findings for these senior BSN students. The *Perceiving Emotions* branch is the ability to recognize emotion in information (Mayer et al., 2018). In this branch, 81.3% of participants scored in the "Competent" range or higher. The narratives reiterated this as almost all students were able to identify and label specific emotions experienced during patient care encounters. Not only did students describe a sadness for their patients, families, and healthcare situation, students also articulated a variety of emotions that shifted throughout and after patient care encounters. The *Using Emotions* branch indicates the ability to generate, use, and feel emotion to communicate feelings or employ in cognitive processes (Mayer et al., 2018). This branch was the lowest scoring branch on the MSCEIT, with 37.5% scoring in the "Consider Developing" range. While a variety of emotions were described, the evidence as to how these emotions were used in cognitive processes was absent from the narratives.

The qualitative category of shifting emotions complements the *Understanding Emotions* branch of EI. Understanding emotion involves the ability to understand how emotions combine, progress, and change through relationship transitions (Mayer et al., 2018). In this branch, 56.3% of participants scored in the "Competent" range and 25% scored in the "Skilled" range. Throughout most of the narrative texts, students described how their emotions changed throughout and after the patient care encounter. The qualitative category of shifting emotions also complemented the *Managing Emotions*

branch, which is the ability to be open to feelings and modulating them in oneself and others to promote understanding and growth (Mayer et al., 2018). Participants scored relatively high in this branch as well, with 62.5% scoring in the "Competent" range and 25% scoring in the "Skilled" range. Narratives within the qualitative category of shifting emotions reflected the ability of handling emotions and not letting emotions impact care negatively.

The qualitative themes sadness for… and shifting emotions also complement the *PNBS* results of the MSCEIT. The *PNBS* is derived from the *Perceiving Emotions* branch of EI and based on items that are either positive (e.g., happiness, excitement) or negative (e.g., fear, sadness) (Mayer et al., 2011). The mean *PNBS* was 100.65, indicating participants assigned both positive and negative emotions to situations. This concept was supported in the narrative texts. While many students started out identifying sadness in their clinical learning experiences, these students also mentioned more than one emotion during or after that same clinical learning experience. The emotions most often described were sadness and frustration followed by joy and happiness, supporting the mixture of positive and negative emotions experienced.

Chapter 5: Discussion and Conclusions

Although a connection between EI and reasoning is suggested through the theoretical framework of the Four Branch Ability Model of EI (Mayer et al., 2004), the evidence of this is limited in the nursing literature. There is no known empirical research thus far on the relationship between EI and clinical reasoning in nursing, specifically with nursing students. Nurses need to be able to effectively reason and make decisions in emotionally charged environments to provide safe and effective care (Kozlowski et al., 2017). The concept of EI and its relationship to clinical reasoning in nursing students is important to consider when fostering the development of holistic and safe practicing nurses.

The purpose of this mixed methods pilot study was to explore EI and its relationship to clinical reasoning in senior BSN students to gain a better understanding of how emotions are used in clinical learning experiences. This study used a convergent parallel mixed method approach where quantitative and qualitative data were collected simultaneously, analyzed separately, then merged for evaluation of convergence or divergence of the data.

This chapter presents a summary of the results of this mixed methods study and provides a discussion of the findings in relation to the literature. This chapter will also discuss the strengths and limitations of this study. Finally, this chapter presents implications for practice, recommendations for further research, and a final conclusion.

Summary of Results

This mixed methods research study sought to: 1) Investigate the relationship between EI and clinical reasoning in senior BSN students, and 2) Explore senior BSN

students' use of emotions in clinical learning experiences. The first research question investigated the relationship between EI and clinical reasoning through bivariate correlational statistical analysis. While no significant relationships were found between total EI and overall clinical reasoning, Strategic EI was found to correlate with components of clinical reasoning. The second and third research questions were addressed through descriptive content analysis of the two reflection prompts. Two categories emerged regarding what emotions were experienced by senior BSN students in clinical learning experiences: 1) Sadness for… and 2) Shifting Emotions. One category emerged in relation to how emotions were used to guide care: Presence. This qualitative strand further enhanced the understanding of senior BSN students' emotions in clinical learning experiences. The fourth research question was addressed by merging the qualitative results with the quantitative data. The data converged, with the qualitative data providing supportive information to quantitative results.

Discussion of Findings

The results of this convergent parallel mixed methods study provide important data regarding EI and its relationship to clinical reasoning in senior BSN students. This study provides more evidence in the literature on the concept of EI and its relationship to clinical reasoning as little attention has been given to this relationship in nursing (Hutchinson et al., 2017). The mixed methods analysis provided complementary as the quantitative strand identified the relationship between EI and clinical reasoning and the qualitative strand deepened the understanding of this relationship. The quantitative strand involved validated and reliable tools, whereas the qualitative strand involved open-ended reflection questions that elicited descriptive responses of emotions and how they

were used in clinical learning experiences. The mixed methods results suggest convergence of the data: both the qualitative and quantitative results reveal the importance of emotions in senior BSN students when thinking through data and coming to a decision when providing patient care.

A significant moderate positive correlation was found between *Strategic EI* area and the clinical reasoning scale of *inference,* with a marginally significant positive relationship found between this same area of EI and overall clinical reasoning and its scale of *induction.* According to Mayer et al. (2018), Strategic EI relates to the ability to think through emotional data and come to a decision. No quantitative studies exist to directly support or refute this relationship between EI and clinical reasoning. However, these findings are partially supported in the literature through the investigation of the relationship between EI and academic and clinical performance. Rankin (2013) found EI to be a predictor of academic performance while Beauvais et al. (2011) and Marvos and Hale (2015) found positive correlations between EI and clinical performance. Positive correlations have also been found between EI and GPA in nursing students (Codier & Odell, 2014; Sharon & Grinberg, 2018). This study adds to the limited literature by specifically focusing on the relationship of EI to the construct of clinical reasoning.

While the quantitative findings demonstrated a relationship between EI and clinical reasoning, the qualitative findings did not directly identify clinical reasoning concepts. However, the findings did provide valuable information about how students reasoned about their emotions to simply be with their patients. The category Presence identified how students used their emotions while caring for patients in clinical learning experiences. This is supported by Baxter and Rideout (2006) as they found that in

addition to knowledge-based decisions, students also make emotional-based decisions during three key encounters in the clinical experience: with the patient, with the clinical teacher, and with the nurse. The qualitative findings highlight the importance of senior BSN students using emotions to connect with patients during the patient care encounter.

The categories identified in the qualitative responses further emphasize what types of emotions are experienced by nursing students when providing patient care and how those emotions guided their care with patients. To date, this is the first known study that investigated what emotions are experienced during clinical learning experiences and how these emotions were used to provide care. The majority of participants reflected on critically ill patients in stressful situations with the following categories emerging: Sadness for…, and Shifting emotions. These categories indicated behaviors reflective of EI abilities and indicated that a variety of emotions were experienced at different times during the clinical learning experience. The use of behaviors associated with EI are effective strategies to manage stressful personal interactions in clinical placement settings (McCloughen & Foster, 2017).

The results of the MSCEIT and reflection prompt responses further inform about emotional intelligence and emotions experienced in nursing students. These participants had relatively high levels of EI, with 87.5% of participants scoring at the level of "Competent" or above in total EI. The literature supports the growth of EI throughout a program of study (Benson, Ploeg, & Brown, 2010; Foster et al., 2017; Larin et al., 2014; Shanta & Gargiulo, 2014). These participants were in their final semester and their culmination of clinical experiences, in addition to classroom and laboratory environment, possibly contributed to a higher level of EI. Furthermore, the *Experiential EI* area scores

were also "Competent" or higher in the majority of participants. Of particular interest are the scores of the *Perceiving Emotions* branch, which is a component of *Experiential EI* and defined as the ability to correctly recognize emotion in self and others (Mayer et al., 2004). In this branch, 25% of participants scored in the "Skilled" and "Expert" levels. This was also evidenced in the qualitative responses by the ability to identify multiple emotions. Nurses who are proficient with identifying and managing emotions are able to process information and facilitate effective communication with patients, families, and colleagues (Shanta & Connolly, 2013).

The results of the *PNBS*, calculated from the tasks in the *Perceiving Emotions* branch, also further inform this study and the understanding of EI in senior nursing students. No statistically significant relationships were found between the *PNBS* and overall clinical reasoning or its individual scales. However, an interesting finding was that the majority of students (87.5%) had a neutral *PNBS* and none of them had a negative *PNBS* and this was supported in the qualitative reflections. There is no evidence in the literature on the concept of *PNBS* in nursing or nursing education and the evidence in the general literature is limited. Ribeiro and Fearon (2010) found that a negative emotional bias led to errors in decision-making with college students. While the findings related to *PNBS* are important to note in this study, significant conclusions cannot be drawn as no participants had a negative *PNBS*. Further study in this area may answer questions about the impact of positive or negative emotions on clinical reasoning.

Strengths and Limitations of the Study

The main strength of this study is that it used a mixed method research methodology to investigate EI and its relationship to clinical reasoning. The strengths of

using a mixed method approach offset the weaknesses associated with both quantitative and qualitative designs (Creswell & Plano Clark, 2011). Another strength of this study is that is it used an ability-based EI model to guide the research. While the empirical evidence on the impact of EI in nursing care is growing, the models used to guide this research are varied. Findings related to EI in the literature have been inconsistent depending on which type of model is used to guide the research. The ability-based model is considered the most empirically valid as it integrates information processing into the concept of EI (Roberts, MacCann, Matthews, & Zeidner, 2010). For consistency in measuring EI moving forward, an ability-based EI model is recommended (Foster et al., 2015; Hutchinson et al., 2017).

There are some limitations to both the quantitative and qualitative arms of this research study. The first limitation of the quantitative arm is the use of a convenience sample and resulting small sample size of 16 senior BSN students in one program. Having less than the desired number of participants decreased the power of the study. A larger sample may have generated different results and therefore the results of this study may not be generalized to other BSN students. The small sample size also caused a limited diversity of the sample demographic variables. There may have been pre-existing differences in the small number who self-selected to participate than in those who did not participate. It is possible that those who chose to participate had higher EI and clinical reasoning scores and therefore not representative of the sample. To better generalize to a larger population, data collection from multiple sites would be necessary.

The second limitation of the quantitative arm was the length and timing of the quantitative tools. The HSRT had 33 items and took approximately 30 minutes to

complete while the MSCEIT had 141 items and took participants 30-45 minutes to complete. The time commitment of both these tools could have impacted participants' willingness to participate. Additionally, scores on the HSRT and MSCEIT may have been impacted by the timing of the data collection. Participants took the HSRT immediately after a class period on campus. Some participants elected to take the MSCEIT during this time as well. While snacks were provided, fatigue from being actively engaged in learning prior to the data collection may have impacted scores on the quantitative tools.

Triangulation of the qualitative and quantitative methods employed found that senior BSN students did not directly mention clinical reasoning concepts in their written reflections. Rather than thoroughly describing actual thought processes related to using emotions, participants briefly described how their interaction with the patient was impacted by these emotions. This limited expansion may have resulted from the use of written reflection prompts. While helpful for obtaining some information on how emotions are used in clinical learning experiences, the use of interviews may have allowed for participants to expand deeper with their reflections and may have resulted in additional or different categories.

Implications and Recommendations for Further Research

The implications of this study are intended to provide information to nurse educators regarding the concept of EI in nursing students, a newer concept in nursing and nursing education. The first implication is based on the findings which revealed a significant correlation between *Strategic EI* and clinical reasoning aspects in senior BSN students. According to Smith et al. (2009), EI skills need to be explicit in nursing

education as they might impact the quality of learning, ethical decision-making, critical thinking, and clinical practice. This research provides important evidence that there is a relationship between aspects of EI and clinical reasoning in senior BSN students. Due to the complexity of the current healthcare system and a lack of deep learning in academic nursing programs, new nurses are underprepared for practice (Kavanah & Szweda, 2017). Fostering the development of EI may be one way nurse educators can better prepare students for nursing practice. Teaching strategies that have been found to develop EI include the use of reflection (Harrison & Fopma-Loy, 2010; Heckemann, et al., 2015; Horton-Deutsch & Sherwood, 2008); however, additional research in this area is still needed. Critical components to nursing practice include engaging with emotions in clinical contexts, engaging with emotions in clinical reasoning, and incorporating emotions in clinical decision making (Hutchinson et al., 2017). Implications for nursing education include integrating a focus on EI and its development with nursing students into teaching and learning practices in order to prepare students for a profession where clinical reasoning is vital.

The second implication is based on the findings of the MSCEIT and the qualitative reflection prompts. While the MSCEIT revealed overall "Competent" levels of EI in senior BSN students, the reflection prompts revealed what emotions senior BSN students experienced during clinical learning experiences and how they were used when providing care to patients. According to Montes-Berges and Augusto (2007), more adaptive coping strategies are found in nursing students who have higher EI because they are able to identify specific emotions during stressful situations. Nursing occurs in a complex and stressful environment, which was evident by participant reflections on

critical patient situations. The qualitative findings of this study may provide an insight to nurse educators as to how emotions are used in clinical learning experiences, which could inform teaching and learning practices with an emphasis on emotions. This mixed method study is foundational for informing further studies on investigating teaching and learning practices focused on EI, specifically in the clinical learning environment.

The concept of EI and its relationship to clinical reasoning was assessed in senior BSN students at one institution in the Midwest. The data obtained provided information about EI, its relationship to clinical reasoning, and how senior BSN students use information to guide their patient care. Replicating the study with changes in implementation is needed to further explore the concept of EI and its relationship to clinical reasoning in nursing and nursing students. The recommendations include the following:

1. Replicate the study with a randomized, larger sample size to increase the generalizability of findings.

2. Replicate the study with different levels of nursing students, such as first through final semester students, to increase the generalizability of findings. In addition, replicating this study with RNs of different experiential levels would also increase the generalizability of findings.

3. Use an explanatory sequential mixed method research approach. In this method, the qualitative strand is developed to explain the significant (or non-significant) quantitative results (Creswell & Plano Clark, 2011). Designing the qualitative questions from the results of the quantitative arm would allow

for more specific questions related to the type of relationships found between EI and clinical reasoning.

4. Use an interview process to collect qualitative results. The interview would allow for participants to expand on or clarify their answers, which may allow for additional qualitative results and thus an enhanced analysis of the relationship between EI and clinical reasoning.

Conclusion

This particular study focused on EI and its relationship to clinical reasoning by exploring MSCEIT and HSRT scores as well as qualitative reflections on how emotions are used in clinical learning experiences. This study helped to establish evidence on the relationship and the use of emotions in patient care encounters. As a result of this research, it can be determined that EI is an important construct in nursing students when it comes to reasoning and providing care during clinical learning experiences. Even though EI is a fairly new concept in nursing and nursing education, it is critical that this concept be further explored in effort to prepare holistic and safe practicing nurses.

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Appendix A

IRB Approval Letter

SOUTH DAKOTA STATE UNIVERSITY
Institutional Review Board

Date: December 17, 2018

Investigator: Heidi Meyer

Project Title: Understanding Emotional Intelligence and its Relationship to Clinical Reasoning in Nursing Students:
                 A Mixed Methods Study

Determination: Exempt, Category 2

Approval #:   IRB-1812010-EXM

The project referenced above is exempt from further review by the Institutional Review Board of South Dakota State University. Exemption is claimed on number(s) 46.101 (b) (2) of the criteria for exemption outlined in 45 CFR 46, section 101.

Note: If the project is changed, it should be re-submitted to the IRB for a determination of whether it still satisfies exemption criteria.

Dianne Nagy
Research Integrity and Compliance Officer

Appendix B

Nursing Research Committee Approval Letter

SOUTH DAKOTA STATE UNIVERSITY
College of Nursing – West River

October 16, 2018

Heidi Meyer
SDSU CON Graduate Student

Dear Heidi,

Thank you for revising your research proposal. I have reviewed and approve the revisions, which should hopefully resolve the recruitment challenges of your initial proposal.

I have approved this for implementation in the spring of 2019 for Nurs 472 on the Rapid City and Brookings campuses. Please now proceed in contacting the Associate Dean for Undergraduate Nursing, Dr. Melinda Tinkle, to inform her of the study.

Once you have completed your study and analyzed your results, the Nursing Research Committee requests that you submit to us a one-page summary of your findings. In this summary, please include your response rate and identify any challenges with recruitment. Best wishes on this important study.

Sincerely,
Mary Isaacson, PhD, RN, CHPN®
SDSU College of Nursing Research Committee Chair
Assistant Professor
mary.isaacson@sdstate.edu
Cellular phone: 605-670-0975

Appendix C

Recruitment Posting

Dear Senior Nursing Student,

Congratulations on your progress in the SDSU Bachelor of Science in Nursing (BSN) program. You have worked hard to get to your final semester! I am also a nursing student at SDSU, in process of a doctoral degree and completing my dissertation. My research seeks to explore the relationship between emotional intelligence (EI) and clinical reasoning in senior BSN students. Little information exists on how emotions are used in the clinical reasoning process in nursing students and I am hoping that each of you will consider volunteering for this study.

I will be visiting your classroom on _____ (date) during the last 15-20 minutes of class to explain the study. For those consenting to participate, I will be staying after class to collect demographic information and administer the online clinical reasoning assessment. This will take approximately 45 minutes. The EI assessment may also be taken this day or at a later date. This assessment will take about 30-60 minutes. A personal laptop is required to complete the assessments, so please bring that to class. Once completed, you will be provided with two reflection questions with an electronic link for follow up. You will have one week to complete the reflection questions and the EI assessment, if not completed on the classroom visit day.

I have attached a Participant Information Sheet, which describes the process in further detail. Participants who complete all three components will be eligible to have their name entered to receive one of three $50 Amazon gift cards.

Thank you! I look forward to meeting you on _____ (date).

Sincerely,

Heidi Meyer
SDSU PhD Nursing Student

Appendix D

Additional Recruitment Posting

D2L Post Title: Seeking additional students for research study - please consider participating!

Sender: Semester 5 Faculty, on behalf of Heidi Meyer, SDSU PhD Nursing Student

There is still time to participate in the research study entitled *Understanding Emotional Intelligence and its Relationship to Clinical Reasoning in Nursing Students: A Mixed Methods Study*!

Participants who complete all 3 components of the study will be eligible to win a **$50 Amazon gift card**. Three participants from each campus will be drawn at random upon close of the study.

If you are willing to participate, please review the Participant Consent Form (attached) for detailed information of this study. Then acknowledge consent and complete the demographic profile electronically at: https://   . Within 24 hours of completion, you will receive an email with instructions and electronic links to the clinical reasoning assessment, the emotional intelligence assessment, and two reflection questions.

If you started the study but did not finish all three assessments, please contact me at the email below and I will send you instructions for accessing the remainder components electronically.

The study will remain open until *18 February, 2019*. Thank you to those who have completed the assessments and reflections on emotional intelligence and clinical reasoning. I know that you are all extremely busy this final semester of your nursing program and I appreciate the time you spend completing the questionnaires.

Sincerely,

Heidi Meyer
SDSU PhD Nursing Student
heidi.meyer@jacks.sdstate.edu

Appendix E

Participant Consent Form

Participant in a Research Project Consent Form
South Dakota State University
Brookings, SD 57007

Department: Nursing   **SDSU IRB Approval No:** IRB-1812010-EXM
Project Director: Heidi Meyer   **Phone No.:** 651-226-2379
E-mail: heidi.meyer@jacks.sdstate.edu   **Date:**

Please read the following information:

1. This is an invitation for you as a *SDSU senior Bachelor of Science in Nursing (BSN) student* to participate in a research project under the direction of Heidi Meyer, SDSU Doctoral of Nursing Student. You must be 18 years or older to participate in this study.

2. The project is entitled: *Understanding Emotional Intelligence and its Relationship to Clinical Reasoning in Nursing Students: A Mixed Methods Study*.

3. The purpose of this project is to explore the relationship between emotional intelligence (EI) and clinical reasoning in senior BSN students in order to understand how emotions are used in clinical learning experiences.

4. If you consent to participate, you will be involved in the following process which will take approximately 1.5-2 hours of your time. The study will begin in a classroom at the SDSU Brookings or Rapid City campus, on a day you are already on campus for a class. A laptop/electronic device is required for participation and completion of the assessments. The following process will take no longer than one week to complete:
    1) The project director will come to an SDSU nursing classroom at the Brookings and Rapid City campuses, immediately following a scheduled course. During this time, the project will be explained and consent will be obtained.
    2) Participants who consent will be asked to stay and complete a demographic information form and the Health Sciences Reasoning Tests (HSRT) via their laptop/electronic device. The electronic link for these will be provided. This will take approximately 45 minutes. If participants have a conflict immediately following class, the PI will remain in the building until (time pm) and be available for participants to come back and complete the demographic information and HSRT.
    3) After completing the HSRT, participants will be able to access an electronic link to the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), which will be sent to their email. This will take approximately 30-60 minutes to complete. Participants will be encouraged, but not required to complete the MSCEIT immediately following the HSRT.
    4) Participants will be provided with two reflection questions related to using emotion in a clinical learning experience. They will also be provided with an electronic link to QuestionPro® to submit reflection question answers.
    5) Participants will have one (1) week to complete, at their convenience, the two additional assessments.

5. Participation in this process is voluntary and will not affect your grades in your SDSU nursing course(s). You have the right to withdraw at any time without penalty. If you have any questions, you may contact the project director as directed below.

6. There are no known risks or direct benefits to you. Indirect benefits may be incidental while participating in this study and include: contributing to advancing the state of the science related to EI and clinical reasoning in nursing education; and knowledge on the concepts of EI and clinical reasoning. Your participation will benefit nurse educators in understanding emotional intelligence and clinical reasoning of nursing students in clinical learning experiences. If the HSRT, MSCEIT, or reflecting on emotions during a clinical experience causes some unease, you may contact SDSU Counseling services at 605.688.6146.

7. There is potential to receive compensation for participating in this study. At the end of data collection, participants who have completed all three assessments (MSCEIT, HSRT, and reflection questions) will have their name entered to receive one of three $50 Amazon gift cards. (Three gift cards will be available for each campus.)

8. The MSCEIT will be scored by Multi-Health Systems, Inc. (MHS) and the HSRT will be scored by Insight Assessment. Your data will be retained by these organizations respectively and kept confidential per each organization's privacy policy. MHS ensures the security and integrity of personal information through a variety of security measures. MHS websites are protected by the Transport Layer Security (TLS 1.2) encryption protocol. Personal information is only processed for the purposes for which it is submitted. Insight Assessment uses the latest in encryption technology to safeguard results, protect the privacy of the test taker, maintain client confidentiality, and protect the nature of the research project. Strict database security and backup procedures are in place to protect assessment and score reporting.

9. Confidentiality is only as secure as the participant's equipment. No guarantee can be made regarding the interception of data sent via the internet. All information collected as a part of this study will remain confidential by the researcher. Identification numbers will be assigned to those who agree to participate. Information obtained for data analysis will be stored on a password protected computer. No names will be linked to the identification numbers in any data analyses or reports. All information will be reported in aggregate only. Following completion of the research, data will be retained for at least 3 years.

As a research participant, I have read the above Participant in a Research Project Consent Form and agree to participate in the research project.

- I understand I am being asked to participate in the research study descried above.
- I realize that my participation is voluntary, and I may withdraw at any time.
- I am 18 years of age or older
- I understand that the data will be kept confidential; however, this information may be used in professional publications and presentations.
- I will receive a copy of this form for my information.
- If I need to, I can contact the Project Director at any time during the study.

Participant's Name (Printed) _____   Date _____

Participant's Signature _____   Date _____

Project Director's Signature _____ Date _____

If you have any questions regarding this study you may contact the Project Director.
If you have questions regarding your rights as a participant, you can contact the SDSU Research Compliance Coordinator at (605) 688-6975 or SDSU.IRB@sdstate.edu.

Appendix F

Demographic Form

Project Title: Understanding Emotional Intelligence and its Relationship to Clinical Reasoning in Nursing Students: A Mixed Methods Study

Demographic Data Form

Name: _____

Preferred Email: _____

1. What is your age (in whole years)?   _____

2. Are you male or female?
    a. Male
    b. Female
    c. Prefer to self-describe (please specify): _____
    d. Prefer not to identify

3. Please specify your ethnicity. (SELECT ALL THAT APPLY)
    a. Asian/Pacific Islander
    b. Black or African American
    c. Hispanic or Latino
    d. Native American or American Indian
    e. White
    f. Other (please specify):
    g. Prefer not to identify

4. Have you ever repeated any nursing courses?
    a. Yes. Please describe: _____
    b. No

5. Do you have any previous degrees?
    a. Yes. Please describe: _____
    b. No.

Appendix G

Reminder Email

Dear Senior Nursing Student,

Thank you again for participating in the research study entitled: *Understanding Emotional Intelligence and its Relationship to Clinical Reasoning in Nursing Students: A Mixed Methods Study*.

If you have already completed the reflection prompts and Mayer-Salovey-Caruso Emotional Intelligence Tests (MSCEIT), thank you!

This message serves as a reminder to those of you who have not completed the additional two assessments yet. These assessments need to be completed by _____ (date).

In case you need the link and reflection questions again, they are noted below:

- Reflection Questions / link: https://www._____

    1. Tell me about a patient care encounter during a clinical learning experience and describe the emotions you experienced during that encounter.
    2. Did emotions guide your care? Yes or No. Please Explain.

The MSCEIT link was emailed directly to you, with login/access information. Please contact me if you are having difficulty.

Thank you!

Sincerely,

Heidi Meyer
SDSU PhD Nursing Student
heidi.meyer@jacks.sdstate.edu

Appendix H

MSCEIT Certification

MSCEIT
Mayer-Salovey-Caruso Emotional Intelligence Test

Certificate of Completion

This is to certify that

Heidi Meyer

has successfully completed the
MSCEIT Certification Workshop

Facilitated by **David Caruso** on **March 13th – 15th, 2017** in **New Haven, CT**
on behalf of **MHS Inc.**

Steven J. Stein
Chief Executive Officer
Multi-Health Systems Inc.

MHS

Appendix I

HSRT Approval

Ariel Yeung

Approval of your dissertation pricing application
To: Heidi Meyer

Hi Heidi,

Thank you for your interest in using the HSRT in your dissertation. Congratulations! Your application has been approved. You can purchase test licenses at a discounted price. Please contact us for a price quote.

Ariel Yeung
Customer Relations Specialist
1-650-697-5628
www.insightassessment.com

Appendix J

CITI Certification

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)
COMPLETION REPORT - PART 1 OF 2
COURSEWORK REQUIREMENTS*

* NOTE: Scores on this Requirements Report reflect quiz completions at the time all requirements for the course were met. See list below for details.
See separate Transcript Report for more recent quiz scores, including those on optional (supplemental) course elements.

- Name: Heidi Meyer (ID: 5153301)
- Institution Affiliation: South Dakota State University (ID: 1214)
- Institution Email: heidi.meyer@jacks.sdstate.edu
- Institution Unit: Nursing
- Phone: 651-226-2379

- Curriculum Group: Basic/Refresher Course - Human Subjects Research
- Course Learner Group: Social/Behavioral Research Course
- Stage: Stage 2 - Refresher Course

- Record ID: 27823941
- Completion Date: 04-Oct-2018
- Expiration Date: 03-Oct-2021
- Minimum Passing: 75
- Reported Score*: 100

REQUIRED AND ELECTIVE MODULES ONLY	DATE COMPLETED	SCORE
SBE Refresher 1 – Defining Research with Human Subjects (ID: 15029)	04-Oct-2018	2/2 (100%)
SBE Refresher 1 – Privacy and Confidentiality (ID: 15035)	04-Oct-2018	4/4 (100%)
SBE Refresher 1 – Assessing Risk (ID: 15034)	04-Oct-2018	2/2 (100%)
SBE Refresher 1 – Research with Children (ID: 15036)	04-Oct-2018	2/2 (100%)
SBE Refresher 1 – International Research (ID: 15028)	04-Oct-2018	2/2 (100%)
SBE Refresher 1 – History and Ethical Principles (ID: 936)	04-Oct-2018	2/2 (100%)
SBE Refresher 1 – Federal Regulations for Protecting Research Subjects (ID: 937)	04-Oct-2018	2/2 (100%)
SBE Refresher 1 – Informed Consent (ID: 938)	04-Oct-2018	2/2 (100%)
SBE Refresher 1 – Research with Prisoners (ID: 939)	04-Oct-2018	2/2 (100%)
SBE Refresher 1 – Research in Educational Settings (ID: 940)	04-Oct-2018	2/2 (100%)
SBE Refresher 1 – Instructions (ID: 943)	04-Oct-2018	No Quiz
South Dakota State University (ID: 12604)	04-Oct-2018	No Quiz

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid Independent Learner.

Verify at: www.citiprogram.org/verify/?k9020b57f-6b5c-4ba3-a02d-cf334e4a58d0-27823941

Collaborative Institutional Training Initiative (CITI Program)
Email: support@citiprogram.org
Phone: 888-529-5929
Web: https://www.citiprogram.org