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Clinical Decision Making in Last Semester Senior Baccalaureate Nursing Students

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CLINICAL DECISION MAKING
IN
LAST SEMESTER SENIOR BACCALAUREATE NURSING STUDENTS

by

Beth Cusatis Phillips

A Dissertation Submitted
in Partial Fulfillment of the
Requirements for the Degree of

Doctor of Philosophy

in Nursing

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December 2015

ABSTRACT

CLINICAL DECISION MAKING IN LAST SEMESTER SENIOR BACCALAUREATE NURSING STUDENTS

by

Beth Cusatis Phillips

The University of Wisconsin-Milwaukee, 2015
Under the Supervision of Professor Karen Morin

Clinical decision making (CDM) is an integral part of what nurses do (Muir, 2004; Ramezani-Badr, Nasrabadi, Yekta, & Taleghani, 2009). Yet, inspection of the nursing literature reveals concerns about the lack of preparation and readiness of new nursing graduates to engage in effective clinical decision making (Smith & Crawford, 2002, Duchscher, 2008, Gillespie & Paterson, 2009, Benner, Sutphen, Leonard & Day, 2010, Noohi, Karimi-Noghondar, & Haghdooost, 2012). This study was conducted to better understand the nature of students' decision making and how they learn to make clinical decisions. Nursing students in their final semester of a baccalaureate program participated in this mixed methods study. Data were collected from 168 students at 11 schools in 4 states. Twenty-eight of these students also participated in focus groups. Hammond's Cognitive Continuum Theory provided the conceptual underpinnings for this study. Two areas of clinical decision making were examined: understanding how senior nursing students learn to make clinical decisions; and determining the nature of the decisions they made.

Six themes emerged from the focus group data: Partners in Learning, Finding One's Voice, Becoming Confident, Multiple Sources of Learning, Patient-Centered Care (The Real

Priority), and The Turning Point. These six themes were interrelated, leading to a core concept of Coalescing for Action.

In this study, three quarters of the participants scored in the quasi-rational range of clinical decision making, indicating they are flexible making decisions that are dependent on the situation at hand. This contradicts with Benner's theory (1994) who proposed they remained at the novice/ analytic stage as a student. Based on Hammond's CCT, the process of growing as a nursing student, through practice and experience requires time and systematic cognitive processing. Students think through the steps of each task they complete. There were no statistically significant relationships between clinical decision making and the predictor variables of age, program type, previous degree/s, previous healthcare experience, or minority status.

Having iterative clinical experiences when possible was important to beginning decision makers as it reinforced lessons and solidified concepts. Having opportunities to repeat skills and care for similar patients also increases the cues students receive. As they recognize more cues, they are better positioned to make quicker decisions without having to systematically process everything. Because nursing care is dynamic and unpredictable, some situations have very little cues, regardless of the students (or nurse's) experience level. Hammond's CCT makes room for this reality in the quasi-rational mode. The properties of the task lead to the cognition and ultimately, the decision. Regardless of years of experience as a nurse then, decision making is dependent on cognition, the cues recognized, and the task at hand (the familiarity of that task by the nurse).

Planning clinical experiences for students in regards to skills and complex patient care situations may greatly enhance decision making abilities. Curricular development with task, cue, and pattern recognition in mind may better prepare students. Creating new models of clinical

education that require true partnerships between schools and healthcare agencies may be what are needed to improve students' entry into the workplace and their readiness for practice. Hiring and preparing clinical instructors who can help students learn to make clinical decisions is essential. Based on these findings, funding for nursing education programs, both undergraduate and graduate education may need enhancement in order to fully prepare students for practice.

Limitations include a small sample size, homogeneous focus groups, and the inadvertent omission of gender on the demographic instrument. In addition, only a cross-section of the lives of these nursing students was captured. The results of this study pave the way for future research on nursing student development in clinical decision making in order to provide for a successful entry into the nursing profession. Longitudinal studies throughout nursing school and into practice may better inform clinical decision making abilities. Intervention studies with nursing staff and clinical instructors will allow for new strategies and models to be trialed.

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CHAPTER 1

Introduction

Nursing students are undereducated for entering today's healthcare workplace (Benner, Sutphen, Leonard & Day, 2010). They are ill-prepared for the profound changes in science, technology, and the nature and settings of nursing practice (Smith & Crawford, 2002). They enter the workplace and find they have neither the practice expertise nor the confidence to navigate what has become a highly dynamic and intense clinical environment burdened by escalating levels of patient acuity and nursing workload (Duchscher, 2008). It is unclear if they are not adequately prepared to make clinical decisions, or if it is the nature of the decisions they make that is insufficient (Noohi, Karimi-Noghondar, & Haghdooost, 2012). In either case, clinical agencies continue to report that nursing students are unable to make appropriate clinical decisions regarding patient care (Gillespie & Paterson, 2009).

Clinical decision making (CDM) is an integral part of what nurses do (Muir, 2004; Ramezani-Badr, Nasrabadi, Yekta, & Taleghani, 2009). Nurses make clinical decisions throughout their work day that can affect patient outcomes. Safe, quality nursing care is dependent on appropriate clinical decision making, which in turn is based on accurate judgments (Cioffi, 2000), sound reasoning, and critical thinking. In order to better prepare nursing students for practice, it is essential that they are taught how to make clinical decisions in a variety of clinical situations. The purpose of this chapter is to explicate the problem investigated, that is how students learn to make clinical decisions, and the nature of the clinical decisions they make. Nature refers to the type of decision- whether analytical or intuitive. Additionally, the problem is placed within a theoretical context, the purpose of the study is stated, and the significance of the study to nursing education, practice, research and theory is explicated.

Problem Statement

Leaders in practice report that nursing students are not adequately prepared for the clinical decision making expected of them after graduation. Nurses process information, think critically, evaluate evidence, apply relevant knowledge, use problem-solving skills, reflect, and use clinical judgment to select the best course of action that optimizes a patient's health and minimizes any potential harm (Berkow & Virkstis, 2008). Only ten percent of hospital nurse executives believe that new graduates are ready to provide safe and effective patient care (Nursing Executive Center, 2008). In fact, employers expect new graduates to possess generic skills and abilities beyond the competencies learned in school (Cabellero & Walker, 2010). Practice leaders challenge nurse educators to devise strategies to address this deficit (Berkow, Virkstis, Stewart, & Conway, 2009). Students spend time in the clinical setting practicing the skills on real patients that they learned in the classroom and in the laboratory. However, upon graduation, they have difficulty managing caseloads of patients and making clinical decisions, particularly in relation to patients with complex medical diagnoses (Kenward & Zhong, 2006; Li & Kenward, 2006).

How students make clinical decisions has been of interest for many years (Shamian, 1991; Ingalls, 1997; Botti & Reeve, 2003; Baxter & Rideout, 2006). However, one of the challenges plaguing nursing education today regarding CDM is the interchangeable use of terms that, upon inspection, gives rise to confusion and lack of conceptual clarity. Thus, it is not uncommon to encounter terms such as critical thinking, clinical reasoning, clinical judgment, and clinical decision making (Thompson & Dowding, 2002; Tanner, 2006; Benner, Sutphen, Leonard & Day, 2010) when describing how students make clinical decisions. All of these terms are interconnected, but they are not the same thing. Critical thinking (CT) has been defined as

“thinking about your thinking while you are thinking” (Paul, 2012, p. 7). Paul described it as a decontextualized form of cognition, and offered that everyone who thinks engages in some level of critical thinking. Tanner (2006) extended thinking to the clinical setting, naming it clinical reasoning (CR), an activity that employs educated thought and connections back to previously learned information.

Lasater and Nielsen (2009) extended the discussion by introducing the term clinical judgment (CJ), which incorporates critical thinking and clinical reasoning and then requires a person to make a conclusion about what needs to be done. Clinical judgment requires clinical reasoning across time about particular patient situations (Benner, Hughes, & Sutphen, 2008). Missing from the previous definitions is the action taken by the nurse or nursing student. CDM incorporates all of the preceding concepts, moving from thought activity to either an action performed or a decision not to act. As noted in *Figure 1*, CDM may be the end result of the other three terms and relies on them to provide informed cognitive direction for the decisions.

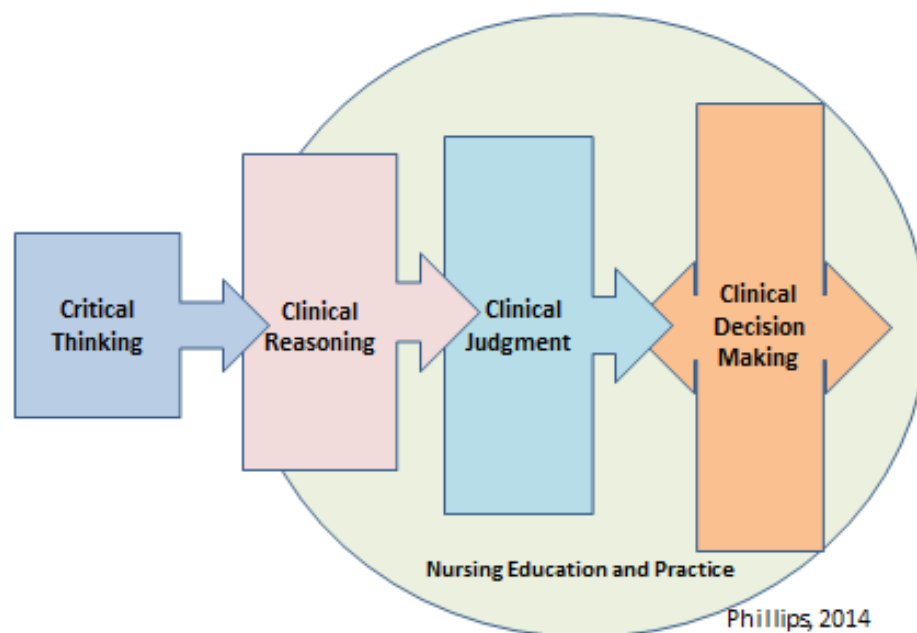


Figure 1 Connection between CT, CR, CJ, and CDM

How students are taught to make clinical decisions may be a critical factor contributing to their inability to meet clinician expectations upon graduation. The use of decision trees, clinical pathways, and standards of care (Dowding & Thompson, 2004, Tanner, 2006, Verdu, 2003) may contribute to student reliance on standard algorithms that do not account for the individualized needs of patients. Such algorithms do not elicit the cognitive abilities needed by the nurse to synthesize all the findings nor do they provide the necessary time to contemplate the different alternatives. There cannot be only one right answer (Dowding & Thompson, 2003). Without knowledge and understanding of the pathophysiology, treatment options, and individual differences in patients, students will undoubtedly miss opportunities to make the best decisions. Thus, student reliance on these tools may inhibit their ability to arrive at unique and perhaps appropriate solutions.

Similar to decision trees and algorithms, the nursing process has been used to guide nursing students' decision making abilities (Wilkinson, 1991; Hughes & Young, 1992). Students are taught and then expected to handle patient information using the nursing process. This systematic method provides some structure and direction for students but only if their assessment findings are correct. Brooks and Thomas (1997) found that the nursing process was not effective in teaching students how to make decisions, how to determine what resources to use, or to explore how to execute the plan because of the mechanistic nature of the process itself. Years later, Huckabay (2009) purported that the main purpose of the nursing process was to provide a systematic approach for handling actual or potential patient care problems. The problem solving structure is there but students often become overwhelmed with the tasks at hand and miss important cues within the environment. These cues require an awareness of the current situation. Without that awareness, the nursing process will not help them make or improve their own

clinical decisions (Brooks & Thomas, 1997; McKenna, Missen, Cooper, Bogossian, Bucknall, & Cant, 2014).

Another education challenge affecting students' abilities to make clinical decisions is the current structure of most nursing schools' clinical experiences (Gaberson & Oermann, 2010). Typically, students attend clinical with a group of other students and one clinical instructor or faculty member (Phillips, nd). Students are assigned one or two patients based on their current semester and course. In conjunction with the staff nurses, students have the opportunity to care for the same patient or patients throughout the clinical time with occasional input and direction from their clinical instructor who is responsible for up to nine other students. Although faculty members try to make assignments that are challenging and facilitate student learning, there is no guarantee that the right mix of patients will be available and willing to have students. It is unpredictable and impossible to structure how much or how often students are able to practice making clinical decisions, which can affect students' learning and growth. There is little to no educational research to guide the making of clinical assignments (Oermann, 2011).

Clinical faculty members often use the Socratic method of questioning in order to elicit student thinking in a clinical situation (Rogge, 2001). Depending upon the preparation and understanding of the student, this method potentially stimulates rich thinking and processing. The student is questioned and encouraged to be curious and to problem solve. In order to help the student learn effectively, the questions need to be matched with the learner; building from lower to higher order. Students can begin to analyze complex situations, consider alternate points of view and make generalizations about the situation, leading to decision making. This process can be spontaneous or pre-planned but without carefully thought out questions, the

students will not achieve the outcomes hoped for by the faculty (Gaberson, Oermann, & Shellenbarger, 2014).

Students also spend a great deal of time in the nursing skills laboratory, practicing skills and learning techniques. Simulation experiences have been used as a way to assist with preparation of nursing students for practice (Kumaran & Carney, 2014). It seems there is great merit in the use of simulation to prepare nursing students; however, there is insufficient evidence to show that simulation solidifies learning more than actual clinical experiences. To that end, the National Council State Boards of Nursing (NCSBN, 2014) completed a 5 year study on simulation in nursing school. Results provide evidence that substitution of simulation experiences (with significant caveats in place) for up to half of the traditional clinical hours result in the same end-of-program outcomes and graduates are equally ready for practice (Hayden, Smiley, Alexander, Kardong-Edgren, & Jeffries, 2014). Findings from this study show promise and may help to improve students' clinical decision making through varied simulation experiences but has not yet demonstrated an improvement over the traditional clinical experiences.

Many factors, both during school and in the practice setting, may influence CDM. These include program type (Aiken, Clarke, Cheung, Sloane, & Silber, 2003), previous healthcare experience (Jullisson, Karlsson, & Garling, 2005), previous degrees (Newton & Moore, 2013), and age (Bjork & Hamilton, 2011). There may be a difference in CDM based on program type (Shin, 1998). Accelerated baccalaureate students are often older, may have worked in previous fields and have more life experience than the baccalaureate student. Pretz and Folse (2011) conducted a study of 175 practicing nurses and student nurses to examine the structures and interrelationships of measures of intuition in their clinical decision making. They

found that experience led to increased use of intuitive decision making, although not necessarily to better use of cues and judgment. The authors also explained that experience is not the same thing as expertise and does not always equate to best practice. In addition, there is not one preferred way to make clinical decisions. Intuitive decision making is no better or worse than analytical decision making. These findings hold merit for the focus of this study in regards to how nursing students make clinical decisions.

Bjork and Hamilton (2011) studied the perceptions of CDM in nurses with varying experience, educational level, age and gender. They found that those with additional experience and advanced education tended to be more intuitive decision makers. In addition, older nurses also demonstrated more intuitive decision making abilities. Men, regardless of their experience level, tended to make decisions similar to those made by female nurses with 10 years of experience. However, Parker's (2014) study of nurses' decision making models in relation to calling for emergency help or Rapid Response Teams (RRT) revealed that nurses who were older, had more experience or a longer tenure on the particular nursing unit tended to be more analytical in their decision making. Thus, there is conflicting information about whether experience is associated with a more intuitive or more analytic approach to decision making by practicing nurses.

Inclusion of demographic variables of age and experience may help illuminate and clarify relationships between decision making and nursing students. These variables may have a connection to a person's ability to make sound clinical decisions, although all have not been studied. Although CDM has been studied in various settings and populations of nurses, it remains unclear as to the way in which nursing students perceive they learn to make clinical decisions. In addition, the nature of the decisions they make, whether analytical or intuitive, has

not yet been studied. Therefore, an exploration into the gap that exists in nursing students' ability to make clinical decisions, and the lack of understanding of the nature of those decisions from the student perspective needs to be done.

Purpose of Study

The purpose of this study was to examine the ways in which last semester senior baccalaureate nursing students perceive they learn to make clinical decisions and to determine the nature of the decisions they make. In addition, possible relationships between clinical decision making and the predictor variables (participants' age, baccalaureate program type, previous degree/s, previous healthcare experience, and minority status) were explored. Hammond's Cognitive Continuum Theory (Hammond & McClelland, 1980, Hammond, 1981) provided the theoretical framework for the study.

Theoretical Framework

The theoretical underpinnings of this study were derived from the Cognitive Continuum Theory of Kenneth Hammond (1981, 1988). This theory originated from cognitive psychology with its beginnings coming from Social Judgment Theory (SJT) and Brunswik's Lens Model (1956). The SJT asserts that the way in which a person notes different cues of information directly affects the accuracy of the judgments made. The Lens Model describes the way people use the cues around them to develop a perspective, right or wrong, and how that perspective can alter their emotions, communication, and decisions. Hammond (1981, 1988) developed the Cognitive Continuum Theory (CCT) based on his earlier work on judgment and decision making in dynamic tasks. In a study with engineers ($N = 21$), Hammond, Hamm, Grassia, and Pearson (1987) compared the ways engineers evaluated highway safety based on three different ways of displaying information that aligned with intuitive, quasi-rational, or

analytic thinking (film strips, bar graphs, and mathematic formulas respectively). The premise was that decision making is driven by four interrelated constructs:

- The cognition of the individual;
- The patterns surrounding the decision;
- The tasks and/ or environment in which the decision is being made; and
- The cues within the task (Hammond, 1988).

Cognition

Hammond (1988) posited that there is one cognitive plane that is comprised of a continuum with analysis at one end and intuition at the opposite end. Hammond (1988) suggested that both analysis and intuition are cognitive positions or modes and are dependent on the weighting an individual attaches to different information cues present in any given situation. Intuition is “generally identified with the mysteries of creativity, imagination, and the pictorial representation of ideas, whereas analysis is identified with logic, mathematics, and rigorous, retraceable thought” (Hammond, 1996, p. 63). Hammond (1988) described a form of decision making that falls in between analytical and intuitive which he calls quasi-rational. Hamm (1988), an understudy of Hammond’s and a physician, adapted the theory to consider modes of practice for physicians. The CCT as described by Hamm is presented in Figure 2. The task structure is described on the left of the diagram from very little detail or ill structured to highly structured. On the right side, three attributes are being described. The more there is a possibility of manipulating the situation, the more visible the process, and the more time required for the process, the more analytical it is.

Patterns

Pattern recognition refers to the inference made from previously learned or experienced information (Cader, Campbell, & Watson, 2005). Hammond et al. (1987) described pattern recognition as part of the CCT. The more a person recognizes patterns in the data and assessment findings, the more intuitive the decision maker will be. Conversely, if no patterns are recognized, decisions will be analyzed and contemplated.

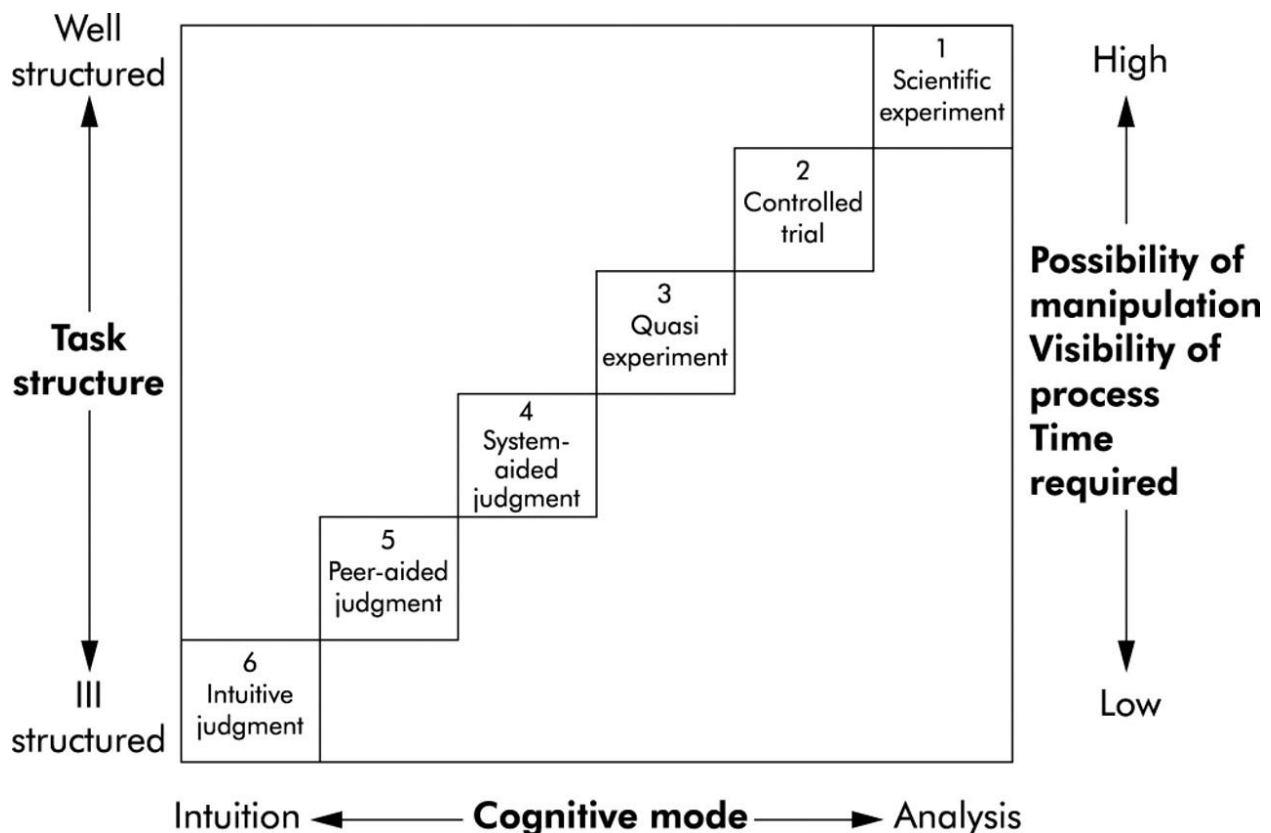


Figure 2. Cognitive Continuum Theory Reproduced from Hamm, 1988, with permission (Appendix A)

Tasks

Hammond et al. (1987) further explained the theory in terms of the task conditions or properties (See Table 1). Tasks refer to the situations in which decisions must be made and do not imply only psychomotor skills. The tasks associated with decisions inform the decision

maker. Tasks, according to this theory, have either surface or depth characteristics. Surface characteristics include the way they appear or are seen by the decision maker. Depth characteristics involve additional steps, such as calculations or formulas that require more analysis to understand or figure out. The tasks that surround decision making include properties that are either well-structured or ill-structured (Hamm, 1988). A task that is well structured is one that has systematic steps or processes. The more structured the task, the more analytical the decision will be. The less structured a task, the more intuitive the decision will be.

Table 1
Inducement of Intuition and Analysis by Task Conditions

Task Characteristic	Intuition-Inducing State of Task Characteristic	Analysis inducing state of Task Characteristic
Number of cues	Large (> 5)	small
Measurement of cues	Perceptual measurement	Objective, reliable measurement
Distribution of cue values	Continuous, highly variable distribution	Unknown distribution; cues are dichotomous; values are discrete
Redundancy of cues	High redundancy	Low redundancy
Decomposition of task	Low	High
Degree of certainty in task	Low certainty	High certainty
Relation between cues and criterion	Linear	Nonlinear
Weighting of cues in environmental model	Equal	Unequal
Availability of organizing principle	Unavailable	Available
Display of cues	Simultaneous display	Sequential display
Time period	Brief	long

Note: Hammond, 1988 with Permission (Appendix B)

Cues

Cues come from the signs and data that are part of the task at hand. When the cues have an objective, reliable measurement, the cues are analytic-inducing. Conversely, if the measurement is perceptual or sensory, it is intuitive-inducing. Cues that are continuous and highly variable in distribution are intuitive-inducing; cues that are dichotomous or have values

that are discrete are analytic-inducing. Cues that are highly redundant are intuitive-inducing. If the cues are displayed simultaneously, they are more intuitive-inducing while a sequential display of cues would be more analytic-inducing. Cues within the task often drive the decision making. Visual cues are most often directly linked to an intuitive decision while complicated formulas or calculations are linked to analytic decisions. If a particular task has many cues that are repetitive and simplistic, decisions will be made intuitively.

Analytic decision making involves well-structured tasks with very little pattern recognition and few cues. Conversely, intuitive decision making is seen with increased pattern recognition and poorly structured tasks but many cues. Quasi-rational decision making falls in the middle of the continuum, as described earlier. It is here that a person may use some data to inform a decision but also recognizes a pattern or cues. Hammond (1981) theorized that different decisions will be reached by different people even if they use the same tasks and cues. In the same way, a person's perspective may change over time and therefore a different decision may be reached by the same person because of learning different aspects related to the situation (Dhami & Thomson, 2012, Hoffman, Aitken, & Duffield, 2009). Again, Hammond's theory asserts that there is not one correct way to make decisions. It involves tasks, cues, pattern recognition, and the cognition of the decision maker.

Research questions

The following research questions guided this study in order to discover more about decision making in baccalaureate nursing students:

1. How do last semester senior baccalaureate nursing students perceive they learn to make clinical decisions?
2. What is the nature of the decisions that last semester senior baccalaureate nursing students make?

3. What predictor variables (age, baccalaureate program type, previous degree/s, previous healthcare experience, and minority status) are related to the way students make clinical decisions?

Definition of Terms

Clinical Decision Making (CDM)

Clinical Decision Making (CDM) incorporates information processing, critical thinking, evaluating evidence, applying relevant knowledge, problem-solving skills, reflection, and clinical judgment to select (and complete) the best course of action that optimizes a patient's health and minimizes any potential harm (Berkow & Virkstis, 2008). Clinical decision making encompasses abstract, decontextualized knowledge, combined with relevant information and skills to make clinical judgments and take action for the good of the patient (Benner, Hughes & Sutphen, 2008). CDM was measured using the total score on the Nurse Decision Making Instrument-Revised 2014 or NDMI-14 (Lauri & Salanterä, 2002) (Appendix C). According to Lauri and Salanterä's instrument (2002), greater scores signify an intuitive approach to decision making while lower scores represent an analytic approach to decision making.

Program Type

There are several ways to become a registered nurse- all are pre-licensure (associate degree, diploma, baccalaureate [BSN], second degree or accelerated baccalaureate [ABSN], and direct entry master's degree). In this study, traditional baccalaureate and accelerated baccalaureate students participated. Program type was determined by student response to Question 7 on the Demographic Instrument (Appendix D).

Previous Healthcare Experience

Having previous healthcare experience as a certified nursing assistant (CNA), emergency medical technician (EMT), or other health-related jobs could change the nature of

one's clinical decision making (Cioffi, 2000, McHugh & Lake, 2010). For this reason, participants were asked (Appendix D, question 6) if they have had any experience and if so, what their title was and what they did.

Assumptions of Study

1. Participants bring their own experiences to nursing school that shapes their learning and their ability to make clinical decisions.
2. Responses received from the participants accurately reflected their opinions on decision making.
3. Participants provided honest answers to survey statements and in focus groups.
4. Senior baccalaureate nursing students begin to recognize cues in patient conditions prior to graduation.
5. Nursing students have some awareness of how they make clinical decisions.

Significance of Study

Theory

The CCT is relevant to this study in nursing education for several reasons. Nursing care of patients includes multiple tasks, some of which are clearly ordered and some of which are not, reflecting a need for intuitive, analytic, or quasi-rational decision making. The healthcare setting is dynamic and often ambiguous and the CCT allows for different modes of CDM by the same person within the same situation. This is challenging in that even on the same clinical unit, the needs of patients and the workflow may differ from day to day, even hour to hour. In interactions with patients, nurses make many decisions. Knowing how nursing students perceive they learn to make clinical decisions may enable further studies into strategies to improve CDM prior to graduation. The CCT holds promise for a better understanding of clinical decision

making as it recognizes the vagueness of practice in that not all data may be present before a decision is made. The CCT may help to describe the nature of the decisions nursing students make. Nurses perform many tasks while caring for patients. Understanding how nursing students recognize patterns and cues within the patient situations they encounter that can trigger a decision may help guide nurse educators to better prepare their students.

Matching patterns of information to other cues or patterns helps people make decisions (Thompson & Dowding, 2002). Recognition of patterns is something that people can be trained to do (Hammond, 1996). Understanding the ways in which students recognize patterns, connect cues, complete tasks, and ultimately make clinical decisions may allow educators to structure educational offerings in such a way as to significantly improve and enhance students' abilities to make clinical decisions.

Understanding how nursing students make clinical decisions and examining the nature of the decisions they make may enhance decision making abilities and more adequately prepare students for practice. Findings from this study on decision making in baccalaureate nursing students may improve conceptual clarity on the various terms interchanged with CDM, provide direction for nursing educators to better understand how students make decisions, suggest further educational research for CDM, and may influence policy on nursing education and preparation for practice. Each is further discussed.

Education

To date, investigators have described nurses' clinical decision making (Lauri, Salanterä, Bild, Chalmers, Duffy, Kim, Henry & Mason, 1997) and models of decision making used by nurses based on location, specialty area and various demographics (Lauri & Salanterä, 1998; Lauri, Salanterä, Callister, Harrisson, Kappeli, & MacLeod, 1998; Lauri, Salanterä, Gilje, &

Klose, 2000; Bjork & Hamilton, 2011; Parker, 2014). The effectiveness of clinical decision making significantly influences patient outcomes (Lauri, Salanterä, Chalmers, Ekman, Kim, Kappeli & MacLeod, 2001). It is one of the many essential behaviors that nurses perform every day in the work environment (Benner, Sutphen, Leonard, & Day, 2010). The complexities of the healthcare setting create challenges for nurses and specifically nursing students as they learn to navigate the system.

Investigators examining clinical decision making in students have explored the decision making activities of nursing students from a qualitative perspective (Baxter & Rideout, 2006); how they acquire decision making skills and how prepared they feel (Standing, 2007); the changing of patient care decisions over the course of the nursing program while utilizing problem based learning (Baxter & Boblin, 2008), and the factors facilitating and inhibiting effective clinical decision making in nursing students (Jahanpour, Sharif, Salsali, Kaveh, & Williams, 2010; Wiles, Simko & Schoessler, 2013). Understanding how baccalaureate nursing students make clinical decisions could help nursing faculty design learning experiences that would better prepare them for the realities of the workplace. Understanding if they make more intuitive decisions versus analytical decisions may help nurse educators craft curricula and develop learning activities to help them strengthen their decision making abilities. With the paucity of research on CDM in nursing students coupled with the lack of adequate preparation for practice, knowing if academically stronger students make more intuitive, quasi-rational, or more analytical decisions could improve the education practice gap. Curricula could be written and directed to provide more learning opportunities at recognizing tasks that need to be considered and cues that are present so students more readily recognize and make the clinical decision at hand.

A redesign of nursing education programming may be needed in order to adequately prepare nursing students for practice today and for the future. This will require change from the National Council State Boards of Nursing to individual state boards of nursing, to schools and universities. Faculty own curricula but administrators manage programs, and accrediting bodies and clinical partners hold the keys to making the whole process work; everyone maintains responsibility for the success of the change.

Research

Findings from this study may be used to generate questions for further research studies on clinical decision making. Understanding the nature of the clinical decisions baccalaureate nursing students make can lead to studies on how to improve the clinical decision making process. The results of this study may inform future studies that focus on ways in which teaching strategies can enhance and improve nursing student decision making. For example, if nursing students tend to make more analytical decisions, then studies done to explore and challenge students' abilities to think on their feet in time-limited circumstances could be conducted in order to increase intuitive CDM. If, for example, accelerated students tend to be more intuitive decision makers, studies to explore possible relationships to previous degrees and life experiences would be valuable. Findings from this study may also inform longitudinal studies, following students through graduation and into practice while assessing their CDM across time and environment. Studying the situation and environment in which decisions are made can also inform nursing and nursing education.

Finally, results from this study may provide evidence to incorporate new interventions into nursing education. For example, developing training modules to help clinical instructors learn to question and challenge students to make clinical decisions could be researched.

Intervention studies on iterative clinical processes to enhance decision making may help develop new strategies for nursing education. New ways of providing clinical education to students could greatly enhance nursing education and their success in practice.

Policy

With practice partners at their sides, improving the decision making abilities of nursing students through major curricular and programmatic changes will require support from policy holders and government funding. At this point major work and funding could focus on mandated faculty development across the country. Results of this study may lead to a need for policy changes both in nursing education and practice. Funding for these changes will be needed. Because change is so difficult, it will be important to ensure administrative support and buy-in to try new curricular programs without the threat of loss of funding or nonsupport within the school, clinical partners, and state and national regulatory accreditation agencies.

Chapter Summary

In this chapter, a study about decision making in baccalaureate nursing students was explicated. Because of a lack of adequate preparation for the realities of the healthcare setting, new nurses struggle with the transition from school to practice. It appears that part of this struggle is about making appropriate clinical decisions. Understanding how they learn to make clinical decisions while in school as well as discovering the nature of the decisions nursing students make may help nurse educators better prepare them to make appropriate clinical decisions in the workplace. Educational, research, policy and practice changes may be needed after discovering how nursing students make clinical decisions. In order to understand both how nursing students perceive they learn to make clinical decisions and determine the types of clinical decisions they make, a mixed-methods design was used in this study.

CHAPTER 2 REVIEW OF LITERATURE

Introduction

The purpose of this study was to examine the ways in which last semester senior baccalaureate nursing students perceive they learn to make clinical decisions and to determine the nature of the decisions they make. Hammond's Cognitive Continuum Theory or CCT (1981) provided the theoretical framework for the study. Literature on Clinical Decision Making and studies done in nursing to understand perspectives of nurses and students regarding clinical decision making will be described. The search process for relevant literature is described followed by an in-depth review of Hammond's CCT (1981). In addition, possible relationships between participants' age, program type, previous degree/s, and previous healthcare experience are examined. Research studies conducted both on CDM in nurses and nursing students will be explicated concluding with a chapter summary.

Search Process

A literature search was conducted using the key terms *decision making, clinical decision making, nursing students, undergraduate and baccalaureate nursing students, nurses, clinical judgment, clinical reasoning, critical thinking, and cognition* in various combinations (see Figure 3. Online databases were accessed regularly between 2012 and 2014, and included PUBMED-MEDLINE, Cumulative Index to Nursing and Allied Health Literature (CINAHL), PsycINFO, and Scopus (Social Science, Nursing and Psychology). Articles, dissertations, and research studies between 2009 and 2014 have been searched. Inclusion criteria consisted of theoretical and empirical literature, spanning several disciplines (engineers, college students, medicine, nursing, social sciences) that explored and/or described the search terms above.

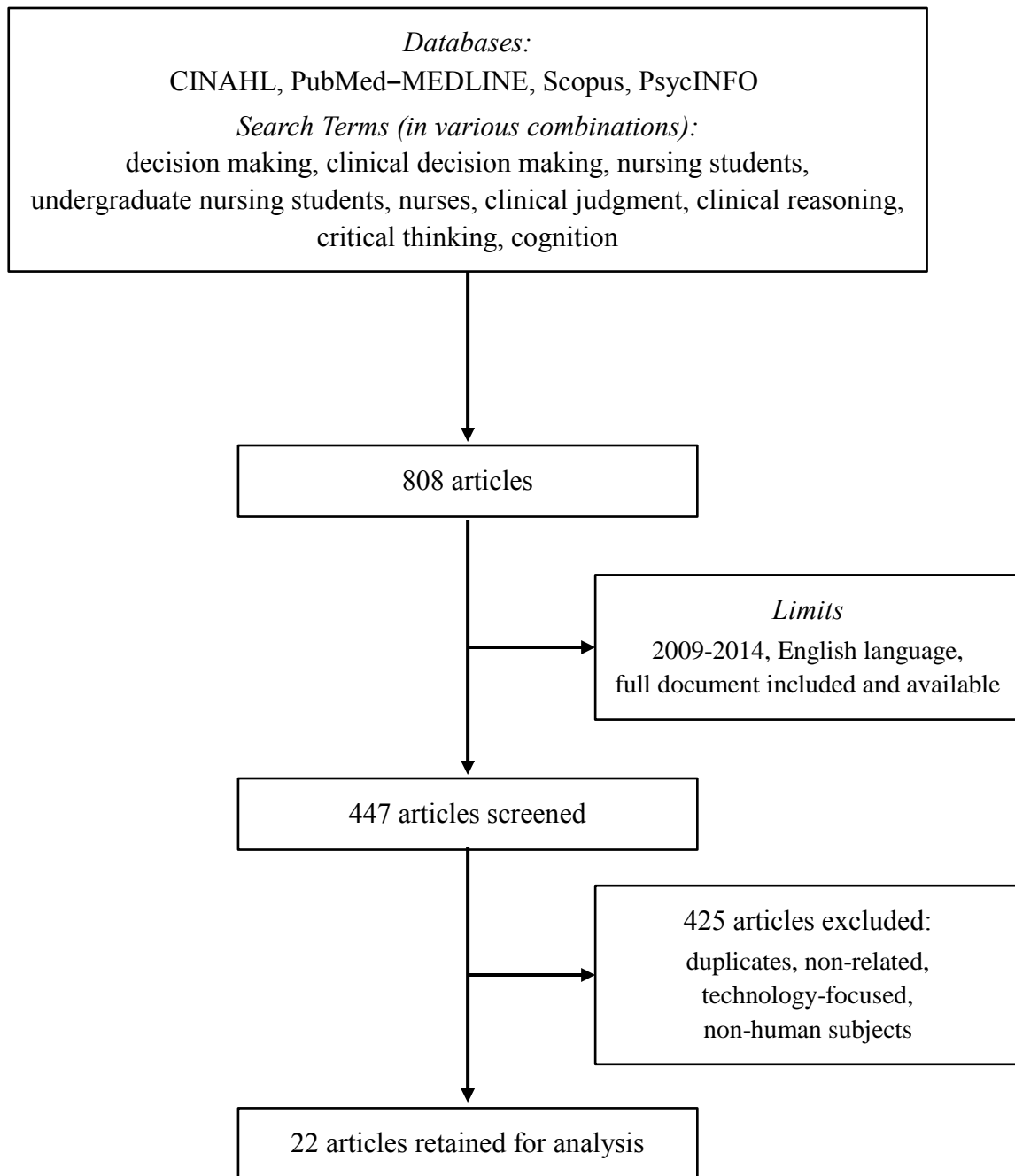


Figure 3. *Search Process*

Exclusion criteria included non-English publications, publications focused solely on technology, and those not involving human beings. An initial search captured 808 publications, but after applying limits and screening for inclusion and exclusion criteria, a total of 22 publications were retained for analysis.

Perspectives of Decision Making

Clinical decision making involves thinking and knowing in various ways (Jacklin, Sevdalis, Darzi, & Vincent, 2009). Foundational understanding of knowledge acquisition and cognitive abilities guides this process (Gul, Cassum, Ahmad, Khan, Saeed, & Parpio, 2010). Historically, the development of theory on cognition focused on two distinct ways of thinking. The two modes of thinking were analytic (rational, reasoning) and intuitive cognition. However, Hammond (1988) believed that cognition and decision making were not firmly executed using just intuition or just analysis. Through his exploration, Hammond (1981) developed the Cognitive Continuum Theory. This is a descriptive, middle range theory that serves to explain how judgment situations relate to thinking or cognition. This theory originated in cognitive psychology with its beginnings coming from Social Judgment Theory (SJT) and Brunswik's Lens Model (1956). The SJT asserts that the way in which a person notes different cues of information directly affects the accuracy of the judgments made. The Lens Model describes the way people use the cues around them, right or wrong, and how that can alter their emotions, communication, and decisions. Hammond combined these two theories/models in order to develop a more comprehensive theory that addressed his stance in a continuum of decision making rather than one way or another.

Although the concepts of intuition and analysis have been theorized and studied often as two separate ways of making decisions (Dreyfus & Dreyfus, 1986, Dreyfus, 1979; Benner, 1984;

Newell & Simon, 1972), Hammond (1981) found that analytical and intuitive processes in decision making are not contradictory or separate. He theorized that they are on a continuum with analytical at one end and intuitive on the other. Hammond suggested that both intuition and analysis are cognitive positions and are dependent on the weighting an individual attaches to different information cues coming from any given situation. Cues come from the signs and data that are part of the situation at hand. They may be laboratory results, assessment findings, or subjective data from a patient, to name a few. He further purports that both tasks and judgment are linked together on this continuum (Hammond, 1981).

Hammond's (1988) CCT posits that, as tasks become more difficult and/or the decision maker has less knowledge and experience, decision making becomes a more analytic process. Decisions can be retraced and justified because they were well thought out and mapped through knowledge and forethought. Conversely, if a task either requires a quick solution or is quite simplistic, and/or the decision maker has more knowledge and experience, decision making becomes a more intuitive process. However, intuitive decision making is not retraceable (Custers, 2013). In other words, even the nurse making the decision may not be able to link back the decision to clear knowledge or experiences from the past; he/she may have just felt it was the thing to do.

Contrary to more recent nursing studies (Cioffi, 2000, Pretz & Folse, 2011, Thompson, Cullum, McCaughan, Sheldon, & Raynor, 2004), Hammond (1988) found that decisions made were not based on years of experience as an engineer but rather on the recognized cues within each construct, the amount of time spent surveying the construct, and the familiarity or pattern recognition found by the engineers. When the subjects had little time, they would make intuitive decisions based on the limited tasks and familiar cues. When they recognized something about

the road- angles, structures (patterns)- they were able to make a decision quickly and intuitively. However, when time was not an issue and the tasks involved were either highly structured or had very few patterns recognized, an analytic decision was made.

According to Hammond (1981), when decisions are made through analysis, information is processed slowly and there is a high conscious awareness of the decision at hand. There are not many cues to guide the decision. When decisions are made intuitively, unconscious data processing takes place. There is less cognitive involvement but rather decisions are made rapidly and based on experience and possibly pattern recognition. This theory may have important implications for nursing education and practice. For example, in a slow, controlled environment such as the lab or a rehabilitation unit, students have time to gather and process information, propose and discuss options and then make decisions. Conversely, in an uncontrolled environment, students may lack the ability to make intuitive decisions.

Hammond (1981, 1988) describes a middle ground in his CCT he calls quasi-rationality. It is described in other literature as analytic-intuitive or intuitive-analytic or mixed decision making (Parker, 2014) where decisions are made using both analytical and intuitive processes. Based on the individual's cognitive processes as well as the task properties, decisions may fall somewhere between intuition and analysis. A patient's condition with minimal or many cues may call for one type of decision making versus the other. In addition, based on the experiences of the decision maker, a decision may be made from a more analytical basis by one, while another would make an intuitive decision. There is not a better way to think, according to Hammond. The mode of cognition is related more to the task properties, which then drive the cognition. He theorized that judgment and decision making occurred on parallel continua between task properties and modes of cognition (See Table 1). The task properties initiate the

type of cognition used. The more a task is structured, the more analytical the decision making will be.

In other words, when a decision needs to be made and the information provided about the situation is specific, structured and detailed, the decision will be made analytically by reviewing all the data points. Hammond (1988) further explains the theory relative to the task properties, referring to them as having either surface or depth characteristics. Surface characteristics of the tasks are overt and include the way they appear or are seen by the decision maker. Depth characteristics refer to the covert relationships among the variables within the task. In the engineering study (Hammond, Hamm, Grassia, & Pearson, 1987), depth characteristics referred to highway aesthetics (intuitive), safety (quasi-rational) and capacity (analytical) while surface characteristics referred to filmstrips (intuitive), bar graphs (quasi-rational) and formulas (analytical). Ultimately, judgments are formed and decisions are made based on the situation at hand, the tasks involved and the cues provided. Hammond's theory and studies (1980, 1981, 1987, 1988) relate well to the processes of decision making in the profession of nursing and this theory has been used in other research studies of healthcare workers, with success at determining decision making.

Other Decision Making Theories

Two other theories regarding clinical decision making are found in the literature- skill acquisition and intuition in decision making (Dreyfus & Dreyfus, 1979, 1986; Benner, 1984); and Information Processing theory (Newell & Simon, 1972). Dreyfus and Dreyfus (1979, 1986) created a model to represent the developmental thinking abilities of pilots. Benner's (1984) work on the Novice-to-Expert Model originated from the work of the Dreyfusses (1979, 1986). This five stage model described skill acquisition based on proficiency. The stages are novice,

advanced beginner, competent, proficient, and expert. Dreyfus (1979) placed decision making in the analytic mode for all the stages except the expert. Benner (1984) applied the Dreyfus model in intensive care units and found the same stages in skills and decision making among nurses. Benner (1984) claimed that novice, inexperienced nurses' portrayed rule-governed behavior which was limiting and rigid. Their lack of experience drove them to make decisions through analysis only; decisions that were systematic and methodical, but lacking in actual knowledge of the situation at hand. Experience is necessary before nurses can apply learned guidelines to individual patients. According to Benner (1984) as nurses progress and obtain more experience and insight, they become more intuitive, able to make decisions and judgments with very little to no clear path to or from the knowledge.

Intuition is used when decisions are made quickly, with very little forethought or rationalization. Benner (1984) described the concept of intuition as a way of making decisions. She thought that nurses made clinical decisions based on a gut instinct or without obvious knowledge of the right choices. For example, an experienced intensive care nurse recognizes the signs of hemorrhagic shock quickly, decides to call the provider, and lowers the patient's head. The nurse may not recognize the pathophysiology behind hemorrhagic shock at that moment, but instinctively knows that the patient's blood is pooling, the blood pressure is dropping, and it is imperative to get blood to the patient's brain. Hence, the nurse lowers the head of the bed.

Intuition was later thought to come from experiences, knowledge and interpretation of the signs and symptoms, rather than just a feeling or sense. Nurses use their expertise and previous experiences to guide their decision making. In addition, nurses utilize pattern recognition with intuition. It may be subconscious, but they link findings to previously learned, seen, experienced events, in order to make decisions. Benner's approach regarding expertise and intuition are

important for nurses, but it does not address analytic decision-making in experienced nurses, and does not help to understand the way nursing students perceive they learn to make decisions.

In contrast to this highly intuitive approach, the information-processing theory (Newell & Simon, 1972) is based on studies of human problem solving or decision making that rely on the earlier knowledge an individual has gained about the issues and areas concerned. Analytic decision making proceeds with a systematic process of synthesizing the cues and determining a solution (Lauri & Salanterä, 2002). Analytic cognition has been explained through evidence-based inquiry and reasoning processes that involve memory, acquisition of cues and cue analysis (Elstein, Shulman, & Spratka, 1978). Here, decisions are made after gathering information about the issue, reviewing possible solutions based on the experience and knowledge of the decision maker, and finally making the decision. Thoughtful, educated rationale is used in this decision making. This may help to partially explain how nursing students make clinical decisions but does not address the intuitive nature of some decision-making.

Summary. Understanding how nursing students make clinical decisions and the nature of the decisions they make may help faculty create more effective learning experiences that results in improved processes and quality of clinical decision making in nurses. Use of a theoretical framework that guides studies is critical to sound research. Hammond's CCT (1988) is the best theory to begin this exploration into the way baccalaureate nursing students make clinical decisions and help uncover the nature of the decisions they make because it incorporates both analytical and intuitive decision making and considers the cognition, patterns, tasks, cues and timing of the event.

Clinical Decision Making in Practicing Nurses

Several studies have been conducted to determine CDM practices of nurses in different care settings and environments in countries around the world using Hammond's theory: Public health nurses in four countries-Canada, Finland, Norway and the United States (Lauri, Salanterä, Bild, Chalmers, Duffy, Kim, Henry & Mason, 1997); Psychiatric nurses and intensive care nurses in five countries-Canada, Finland, Northern Ireland, Switzerland, and the United States (Lauri, Salanterä, Callister, Harrisson, Kappeli, & MacLeod, 1998); Finnish nurses across five fields of nursing- long-term care, short-term medical-surgical care, critical care, health care, and psychiatric care (Lauri & Salanterä, 1998); Psychiatric nurses in the US (Gilje & Klose, 2000) and Finland, and Northern Ireland (Lauri, Salanterä, Gilje, & Klose, 2000); Nurses in long and short-term care settings in five countries-Canada, Switzerland, Sweden, Finland, and the United States (Lauri, Salanterä, Chalmers, Ekman, Kim, Kappeli, & MacLeod, 2001); Nurses working in hospital settings in Norway (Bjork & Hamilton, 2011); and Medical surgical nurses' needing to call a rapid response (Parker, 2014). Each of these studies will be described briefly here and in Table 2.

In their descriptive, quantitative study, Lauri, et al. (1997) described the decision making processes of 369 public health nurses in Canada, Finland, Norway and United States. Using the Nurse Decision Making Instrument (NDMI), they found statistically significant differences in clinical decision making by public health nurses in different countries. Although not yet named analytic, quasi-rational, and intuitive in this study, the investigators found that nurses from Finland tended to be more analytical decision makers while Canadian nurses were more intuitive.

Table 2. *Evidence Table*

	Author/ Year	Study focus	Study Design # of Subjects	Factor alpha
Clinical Decision Making in Practicing Nurses	Lauri & Salanterä (1995)	CDM in Finnish and public health nurses	Descriptive $N=200$	0.85-0.90
	Lauri et al. (1997)	DM processes of public health nurses in Canada, Finland, Norway, & US; discuss differences among the countries.	Quantitative $N=369$	0.73-0.92
	Lauri & Salanterä (1998)	CDM in different fields of nursing	Exploratory / Instrument development $N=483$	0.72-0.92
	Lauri et al. (1998)	CDM in Intensive care nurses in Canada, Finland, Northern Ireland, Switzerland, and the US	Descriptive $N=314$	0.89-0.92
	Lauri et al. (1999)	DM in psychiatric nurses in Finland, Northern Ireland, and the US	Descriptive $N=339$	0.90-0.92
	Lauri et al. (2001)	Cognitive processes nurses use in DM in long and short term care settings in 5 countries	Descriptive $N=459$	0.85-0.92
	Lauri & Salanterä, (2002)	Developing an instrument to measure and describe CDM	Instrument development $N=1,460$	0.85-0.91
	Gilje, F. & Klose, P. (2000)	CDM in US psychiatric nurses	Descriptive $N=351$	0.85
	Bjork & Hamilton (2011)	CDM in hospital nurses in Norway	Cross sectional survey $N=2,020$	0.863
	Wiles et al. (2013)	Reflection on patient situations with clinical judgments and decisions	Qualitative interviews $N=5$	----
	Parker (2014)	Relationships between nurses' DM during a RRT activation	Descriptive $N=166$	0.84-0.89
	Baxter & Rideout (2006)	Decision making activities in 2 nd year nursing students	Intrinsic case study $N=12$	----
	Standing (2007)	How nursing students acquire clinical decision making skills	Phenomenological study $N=20$	----
	Baxter & Boblin (2008)	What influences the decision making of nursing students in different settings and how they develop their decision-making abilities	Single-case study approach $N=19$	----
	Cruz et al. (2009)	Nurses' accuracy at selecting appropriate nursing diagnoses and interventions after training	Exploratory case study design $N=39$	----
	Hickey (2009)	Nurse preceptors' perceptions of new graduate preparation for practice including decision-making	Mixed methods design $N=62$	0.74-0.90
Clinical Decision Making in Nursing Students	Jahanpour et al. (2010)	Investigate factors that facilitate and inhibit effective clinical decision- making in senior nursing students in Iran	Exploratory qualitative $N=32$	----
	McKown et al. (2011)	Explore and discuss the benefits of the DEU for clinical practice	Pilot evaluation $N=12$	----
	Levett-Jones et al. (2010)	Creation of an educational model for enhancing student knowledge on CR & CDM	Informational article	----
	Freundl et al. (2012)	Review of the DEU model for nursing education	Literature review	----
	Rhodes et al. (2012)	Exploration of students', staff nurses' and faculty's perceived outcomes of the DEU	Longitudinal mixed methods	----
Models	Hayden et al. (2014)	The use of simulation in place of clinical hours	Multi-site longitudinal RCT $N=666$	

Norwegian and U.S. nurses were more quasi-rational. Differences were related to the nature of the country's health care systems, nursing education, systems of nursing tasks and contexts, and nurses' scope of practice.

In 1998, Lauri et al. repeated the 1997 study, this time examining decision making of nurses ($N = 314$) practicing in the Intensive Care Unit (ICU) in Canada, Finland, Northern Ireland, Switzerland, and the US. They used the same 56 item questionnaire. Results were similar to the 1997 study, showing differences between European countries and North American countries in nurses' decision making regarding data collection, problem definition, and planning. Interestingly, decisions about implementation and evaluation strategies in nursing were quite similar across all countries.

Building on previous work, Lauri and Salanterä (1998) also studied Finnish nurses ($N = 483$) from long-term care, short-term medical-surgical care, critical care, healthcare, and psychiatric care settings. After completing a factor analysis of the responses to the 56 items of the Nurse Decision Making Instrument, they identified five themes or models to represent the factor loadings. They were Rule Oriented (associated with analytical decisions); Nursing-Process-Oriented (associated with the nursing process and nursing knowledge); Nurse-Oriented and Patient-Oriented (both associated with information processing); and the Intuitive Model (grounded in intuitive decision making theory). Based on the nursing specialty, different models were used more often. For example, in short-term medical-surgical care settings and critical care units, Patient-Oriented and Intuitive models were used much more. However in long term and psychiatric care, the Rule-Oriented model was used most often. The nurses' experience, measured in years at work, had no significance with the model chosen.

Replicating the study once again, Lauri et al. (1999) studied the decision making processes of psychiatric nurses in Finland, Northern Ireland, and the U.S. ($N = 339$) and again found differences based on the country in which the nurses lived. They again used the 56 item NDMI. Lauri et al. (1999) stated that the foundational thinking that supports the nursing process and nursing care plan development is based on rational or analytic decision making. Their findings revealed three different models of decision making based on factor analysis and stages of the decision making process: Analytical logically defensible-used more in planning, implementing and evaluating nursing care; Intuitive Interpretive-used most in collecting information, defining problems and planning care; and Analytical Processing-used in all stages but predominantly in collecting information and defining problems. All models had statistically significant country differences ($p < .001$).

Finnish psychiatric nurses tended to use more Analytical Processing and Analytical Logically Defensible Model in their decision making, although they used all three models across the decision making process. Northern Irish psychiatric nurses were similar except they did not use the Intuitive Interpretative model. American psychiatric nurses did not use the Analytical Logically Defensible Model; instead, they most often used the Intuitive or the Analytical Processing Models. The authors concluded that the differences may be related to the nursing education provided in the countries as well as the scope of practice in the country. They described the challenge for future research to address why decision making varies according to countries and specialties of nursing. This may shed light on the effects of nursing education and specialty training on clinical decision making and needs further exploration.

In a descriptive, quantitative study, Gilje and Klose (2000) used the American sample from a larger study (Lauri et al, 1998) and studied American psychiatric nurses ($N = 351$) in

order to identify their decision making approaches as well as to test the 56 item instrument in the US. These researchers acknowledged the possibility of cultural bias and translation issues when using an instrument developed in another language. They completed a factor analysis and five factors emerged representing decision making stages: Intuitive, Self-confidence, Interpretive, Collected information, and Analytic processing. Clearly US psychiatric nurses in this study demonstrated decision making that is multi-dimensional. Their results corroborated with other studies, noting that US psychiatric nurses mostly used intuitive processes when making decisions. They found that experienced nurses were much more apt to use intuitive decision making and were also more self-confident in their decision making. The majority of the sample was baccalaureate prepared and over the age of forty with 20 or more years of psychiatric experience. This is similar to Benner's work on Novice-to-Expert (1984) which stated that as nurses gain experience, they become more intuitive.

Using a cross sectional survey design, Bjork and Hamilton (2011) analyzed Norwegian nurses' perceptions of clinical decision making in their clinical practice ($N = 2,095$) using the shortened version (24 items) of the previous 56-item Nurse Decision Making Instrument (NDMI). They also looked at differences in decision making based on demographics and contextual variables of years in present job, advanced education, male gender, higher age and surgical field of practice. They found that intuitive CDM was associated significantly with more years on the job, higher education, males, nurses on surgical units and older nurses. These findings have been seen in other studies but the number of years of experience was not supported in either the Lauri et al (1998) or Lauri and Salanterä (1998) studies. The authors linked the nurses on surgical units to intuitive decision making based on their assumption that patients in the surgical environment are more acutely ill, they have more frequent health changes, and

nurses in this environment are likely to face more uncertainty, all of which favors an intuitive response.

Using a descriptive, cross sectional quantitative design, Parker (2014) studied the relationships between nurses' decision making model (analytic, quasi-rational, or intuitive) during a rapid response team (RRT) activation and the frequency of RRT activation ($N = 87$). He used the 24 item NDMI and found that 70.1% of the nurses used a quasi-rational model and 21.8% used an analytic decision making model while only 8% used an intuitive model during RRT activation. Differences in the number of RRT calls between the three decision making models was significant ($p=0.003$). Nurses who called RRTs more often used a more analytical decision making model and they also showed a higher level of skill in early recognition of clinical deterioration than nurses who used the intuitive or mixed models.

Summary. The numerous studies examining clinical decision making in nurses using Hammond's CCT (1981) demonstrate conflicting results regarding the nature of the clinical decisions made. It is not clear if nurses use intuitive decision making strategies when they are under pressure and in acute, uncertain circumstances, or whether they analyze the situation and gather cues to inform their decisions. It is also unclear if age and education play a role in the nature of the decisions nurses make. Moreover, most studies are descriptive in nature.

Clinical Decision Making in Nursing Students

Baxter and Rideout (2006) conducted an intrinsic case study (Grandy, 2010) to explore the clinical decision making activities of baccalaureate nursing students in the second year of a 4 year program ($N = 12$). The aim of the study was to discover how the students determined the need to make a decision; how they responded to a pending clinical decision; and the types of decisions nursing students made in the clinical setting. In addition, factors were explored that

enhanced or impeded the decision making process. They used purposeful sampling which involved twelve second year nursing students.

The decision making of nursing students was found to be highly influenced by the patient encounters as well as interactions with the nursing staff and instructors. The complexity of the patient situations created many more opportunities for decision-making because of all the demands, emotions and expectations (Baxter & Rideout, 2006). The patient provided a multitude of cues, both nonverbal and verbal for the students to act on if they recognized them and interpreted them correctly. When students recognized the need for a clinical decision, they made every effort to make a decision that would benefit the patient.

In a longitudinal hermeneutic phenomenological study, Standing (2007) explored how nursing students ($N = 20$) acquire clinical decision making skills and how well prepared they were regarding responsibilities as Registered Nurses. Data were collected over 4 years using interviews, reflective journals, case studies, critical incident analyses and document analysis. Four sets of interview questions guided the interactions with the students over the four year timeframe. During the first interview, they were asked to share “how decisions were made at home and how they went about making decisions” (Standing, 2007, p. 262). Interview two began with the participants being asked to reflect on a typical clinical day with patients. They were asked to discuss choices they made during tasks, and what they had learned about clinical decision-making. During interview three, participants were asked to describe their clinical experiences with planning care for patients. Finally, during interview four, they were asked to reflect upon lessons learned about clinical decision-making. Findings revealed a need for more interactive teaching methods during nursing school and better preparation for practice through development of problem-based, clinically relevant learning activities. Learning about clinical

judgment and how to make clinical decisions while in school may enhance students' decision-making skills (Standing, 2007).

Baxter and Boblin (2008) used a qualitative single-case study approach to address how patient care decisions change throughout four year baccalaureate (BSN) students' program of study; what influences the decision making of nursing students in different settings, and how nursing students develop their decision making abilities regarding a problem-based learning approach and a clinical experiential approach. Nineteen participants from a 4 year baccalaureate (BSN) program participated. Students' ages ranged from 18 to 24 years old and the majority of the students came into the program directly from high school. There were students representing each of the four years of the BSN program who were asked to journal and participate in one interview.

They found that students made five different types of decisions regardless of their progress in the nursing program. The decision points were assessment, intervention, resource, communication and action. Nursing students acted or failed to act on these decision points based on their overall perspective of the amount of risk to themselves (success in the program) or to their patient (injury or complication) rather than if the decision was best for the situation at hand. Baxter and Boblin (2008) explicate that efforts must be made to ensure connections between the theoretical component of nursing education and what occurs in the clinical setting. Implications from this study call for reevaluation of nursing education to determine whether the curricula provides the necessary tools to facilitate the development of decision making and whether the students are sufficiently encouraged to engage in making all kinds of decisions (McCaughan, 2002). Limitations of this study were that the researchers failed to clearly describe types of teaching or learning strategies that guided students to make a particular decision.

Hickey (2009) conducted a mixed methods study of the preceptors ($N = 62$) of new graduate nurses regarding their preparation for practice. Eighty two percent of the preceptors indicated that clinical decision making was important or very important. However, only 20% reported new graduates demonstrated this most of the time. Hickey (2009) concluded that the academic preparation of nurses needs to be reformed in order to adequately prepare them for practice. Understanding how students make decisions can guide researchers in ways to improve decision making approaches while in school.

Jahanpour, Sharif, Salsali, Kaveh, and Williams (2010) studied clinical decision making in senior nursing students in Iran through an exploratory qualitative approach. The aim of the study was to investigate the factors facilitating and inhibiting effective clinical decision making for these senior nursing students. The sample consisted of 32 students in their final semester of a baccalaureate nursing program. This was a first degree for all students and none of them had previous healthcare experience. Data were collected by conducting focus groups of four students at a time over the final 12 weeks of the semester. Four students in a focus group is not conducive to open sharing and a meaningful discussion (Stewart & Shamdasani, 2015). Four themes were identified from the focus groups which were deemed important factors in nursing students' clinical decision making. These were clinical instructor incompetence, low self-efficacy, unhelpful clinical learning climate, and experiencing stress. No facilitating factors were identified.

A lack of autonomy was suggested by one participant as a barrier for effective clinical decision making in that opportunities to make decisions were not presented to them because of a risk to patient safety. Another student was offered an opportunity to perform an intravenous (IV) catheter insertion, but the clinical instructor decided what size IV to use and what vein to stick.

Suggestions made by the participants for teaching strategies to enhance or improve their decision making abilities were asking questions of students, providing hints to them, holding clinical conferences, conducting patient rounds, completing case studies that stimulated their thinking, and allowing for active learning in the clinical setting.

The theme of experiencing stress revealed itself in overwhelming fear. Participants feared they would harm someone or be unable to perform a particular skill. They feared the retribution of making the wrong decision or making a mistake. This fear may inhibit their abilities to make sound clinical decisions during school and after they graduate. Understanding the importance of support and confidence-building while still in school is an important part of teaching students to make clinical decisions.

Thompson and Stapley (2011) conducted a systematic review to determine efficacy and effectiveness of educational interventions designed to improve student and experienced nurses' judgment and decision making (DM). They approached DM as a core nursing competence and considered it to be a cognitive skill that needs to be taught and developed. "Clinical decision making involves cognition, judgment, and socially located behavior and does not always respond as expected to educational interventions or variables such as clinical experience" (Thompson & Stapley, 2011, p. 881). They deliberately included nursing students because their focus was on the impact of educational interventions. They defined an intervention in two ways: as a strategy that focused on effectiveness when in a practice-based environment; and focused on efficacy when it took place in a controlled setting like a simulation lab. Twenty-four studies were included in the review: 19 were pre/post-test studies and two were historical control studies. Three of the studies were randomized control trials.

Sixteen of the studies targeted student nurses and nurses' continuing education and took

place in an educational setting. Although most studies were conducted prior to 2009, one study (Cruz, Pimenta, & Lunney, 2009) fit the inclusion criteria. However, this study did not directly address clinical decision-making or educational strategies to learn to make clinical decisions. It described critical thinking and diagnostic reasoning of nurses ($N=39$) for the purposes of testing accuracy of the nurses' selection of the appropriate nursing diagnoses.

Lessons learned through this systematic review are valuable for future work. Thompson and Stapley (2011) found that most of the studies failed to provide details about the intervention content in order to replicate the work. It was also unclear who delivered the educational intervention and if any skills were required. Contamination bias was a concern in a third of the studies. In some of the studies, the control and experimental groups were treated differently in ways other than the intervention. Thompson and Stapley (2011) concluded with a request for more randomized comparisons of approaches to developing decision and judgment skills in nursing which is difficult to do with the variance of curricular structure, teaching methodologies and access to nursing students. In addition, they surmised that linking decision making theory such as the Cognitive Continuum Theory (Hammond, 1988) with pedagogical theory while providing details of the intervention utilized, including evaluative processes, will enable replication and development of appropriate educational interventions. This is encouraging for future studies after determining the nature of the clinical decisions made by nursing students.

In a qualitative study of newly graduated nurses, Wiles, Simko, and Schoessler (2013) conducted individual interviews with five new RNs using open-ended questions. During the interviews, the newly graduated nurses were asked to reflect on patient situations in which they were challenged to make clinical judgments or decisions and then share their experiences. Three themes emerged: developing confidence in practice, seeking assistance, and decision making.

Within the decision making theme, participants described themselves as having self-doubt, lacking experience, needing decision frameworks to help make decisions, and needing time for reflection on the action or inaction that took place. Wiles, Simko, and Schoessler (2013) stated “Theoretical knowledge, practical knowledge, and personal knowing all influence the nurses’ ability to make decisions” (p. 170). Tapping in to these themes and lessons learned while still in school may better prepare nursing students for decision making after graduation.

Summary. Although several studies have been conducted either with nursing students, or with a focus on nursing education, the nature of clinical decision making is no clearer. Most of the studies were qualitative in nature and employed small sample sizes (12-32). Other work has been done to examine the way in which nursing students are taught, both in the laboratory and in the clinical setting. However, none of the studies clarified the way in which nursing students perceive they learn to make clinical decisions or the nature of the decisions they make.

Models of Clinical Education

In an attempt to improve nursing students’ ability to make clinical decisions and become more ready for the workplace, a revised model of clinical education has been created and is being tried in many places across the country and world (Freundl, Anthony, Johnson, Harmer, Carter, Boudiab, & Nelson, 2012; McKown, McKown, & Webb, 2011). The Dedicated Education Unit or DEU model shows promise for improved clinical preparedness and practice with decision making in nursing students as they are exposed to more of the realities of the clinical environment. Students spend concentrated time with the staff nurses and receive more one-on-one feedback from the nurse with whom they are paired. In addition, they have the opportunity to provide care and perform skills more often including making clinical decisions with the support of the nurse. In the traditional model of clinical education, students are part of a

group of 6-9 other students with one instructor (McKown, McKown, & Webb, 2011). In that model, it is impossible for one educator to provide every student with the opportunities to make clinical decisions with every patient. Findings showed that the culture of the unit, the buy-in of the managers, and previous experiences with students influenced successful implementation of the DEUs (Freundl, Anthony, Johnson, Harmer, Carter, Boudiab, & Nelson, 2012). The closer connection with the staff nurses may play a huge role in the development and decision-making abilities of the students.

As promising as it seems, the DEU model is not without challenges (Freundl, Anthony, Johnson, Harmer, Carter, Boudiab, & Nelson, 2012, Rhodes, Meyers & Underhill, 2012). Turnover of staff on the units and staffing shortages interrupt the continuity of the DEU. The staff nurses may become overburdened as many are already working short staffed and long hours. In addition, staff nurses chosen to work with students are often the strongest nurses who are simultaneously charged with orienting new staff nurses to the unit. They get called on more often to step in and orient or work with students. Also, to date, studies have focused on the preceptor role and perceptions of the DEU, the education-practice partnership, and overall satisfaction of the experience without delving in to how this model may enhance learning and clinical decision-making for nursing students (McKown, McKown, & Webb, 2011; Freundl, Anthony, Johnson, Harmer, Carter, Boudiab, & Nelson, 2012; Rhodes, Meyers & Underhill, 2012). It is unclear if and how this model enhances clinical decision making in the nursing students.

There has been a surge of the use of simulation and high tech equipment in skills labs in order to better prepare students for practice. The National Council State Boards of Nursing (NCSBN) conducted a national, multisite simulation study (2010) to look at use of simulation in

place of clinical hours. They measured how prepared students are for practice, how competent they are once they enter the workforce, and how knowledgeable they are based on 3 subgroups with varying simulation to clinical time. They found that student success (a passing grade and ultimate passing of National Council Licensure Examination (NCLEX) were the same whether the students had traditional clinical hours or whether up to half of their clinical time was done using simulation (Hayden, Smiley, Alexander, Kardong-Edgen & Jeffries, 2014). From this important study, it is clear that learning takes place whether in clinical or in the simulation lab. However, it is still unclear if simulation enhances the learning of clinical decision making for real world practice.

Another way researchers and educators are attempting to better prepare nursing students for decision making is through the use of new teaching strategies. Unfolding case studies in the classroom setting are showing promise as a way to connect theory to practice for the students (McCormick, de Slavy, & Fuller, 2013). Without the fear of hurting a patient, students are exposed to the case and the patient situation. They are able to process information, consult with peers and other faculty and make a clinical decision. Afterwards, they are encouraged to debrief in order to continue to learn from the experience. This is seemingly an ideal way for students to learn. However, it is unrealistic to assume that making a decision in this one-patient/ artificial situation will adequately prepare the student for practice. Iterative experiences with this type of learning over time may assist the students' decision making abilities. Near the end of their program of study, students who have learned in this way throughout their program may demonstrate a stronger ability to make clinical decisions, or may show a particular approach to decision making (Johnson & Flagler, 2013).

Levett-Jones, Hoffman, Dempsey, Jeong, Noble, Norton, Roche et al. (2010) describe an

educational model for enhancing nursing students' ability to identify and manage clinically at risk patients. The authors indicate the model uses clinical reasoning (CR). Yet, they describe nursing students' use of clinical judgment and decision making with patients. Their interchangeable use of terms again highlights the terminology confusion. They describe learning to reason effectively as essential teaching for nursing students as it "doesn't happen serendipitously" (p. 516). The model they developed emphasizes that nurses must practice using the five *rights* of clinical reasoning: "the *right* cues and take the *right* action for the *right* patient at the *right* time and for the *right* reason" (p. 517). For each *right*, there are decisions to be made. For example, if a cue is recognized, should the provider be called, or can it wait? Is this the correct action for this problem or not? Does this action fit this patient and his or her other health issues? Is this the right time to take this action? Finally, is the nurse deciding to do this for the patient for the right reason? Is it for the betterment of the patient, or is it because the nurse was told to do it? Without the ability to make these decisions, patients suffer. This model holds promise for enhancing students' clinical decision making and providing them with a tangible tool to aid in their thinking but it has not been studied or used in practice to determine efficacy.

Summary. Studies have been conducted to explore CDM in nurses and in nursing students. Most of the studies involving nurses were quantitative and descriptive in nature and Studies of nursing students were mostly qualitative in nature and had very small sample sizes. In addition, they did not elicit answers to how nursing students perceive they learn to make clinical decisions. Furthermore, it remains unclear if nursing students are more analytical or more intuitive in their decision making. There continues to be a gap regarding the decision making of nursing students. This study explored the way in which nursing students in their final semester

of their baccalaureate program perceived how they learn to make clinical decisions. This study also explored the nature of the decisions they made and examined relationships between several demographic variables and the students' CDM.

Chapter Summary

The current literature on clinical decision making helps to describe how nurses make clinical decisions and how students may better learn to care for patients. But, how nursing students perceive they learn and how they make clinical decisions remains unclear. A consistent definition of clinical decision-making and related terms remains elusive. Studies focused on perception and satisfaction are interesting but not helpful to understand the learning needs of nursing students. Studies have also determined that in acute settings like the emergency department and rapid responses, nurses who utilize analytical skills to determine the best clinical decisions actually are more accurate more of the time. Studies involving nursing students describe clinical decision making, but many fail to conduct research to determine how they learn to make clinical decisions, or what the nature of the clinical decisions they make is-analytical or intuitive.

Chapter 3 METHODOLOGY

Introduction

The purpose of this study was to examine the ways in which last semester senior baccalaureate nursing students perceive they learn to make clinical decisions and to determine the nature of the decisions they make. In addition, possible relationships between clinical decision making and the predictor variables (participants' age, baccalaureate program type, previous degree/s, previous healthcare experience, and minority status) were explored. Hammond's Cognitive Continuum Theory (1980, 1981) provided the theoretical framework for the study. The methods, setting, and sample are described in this chapter. Measures used in this mixed methods study are explicated along with the demographic variables examined. The data collection procedure is described as well as the strategies for both quantitative and qualitative data management and analysis including methodological triangulation (Bekhet & Zauszniewski, 2012).

Methods

Design

This descriptive study used a mixed methods design (Tashakkori & Teddlie, 2003). The methods included survey research through administration of a quantitative survey and the conduct of focus groups in order to answer the questions of how baccalaureate nursing students perceive they learn to make clinical decisions and the nature of the decisions they make: either analytical, quasi-rational, or intuitive. Mixed methods research combines the generalizability of quantitative research with the contextual approach of qualitative research (Creswell, 2009). When studying certain types of phenomenon, mixed methods may better capture the essence of the subjects. When little is known about a subject, in this case clinical decision making in nursing students, mixed methods research is ideal. Although the findings may be focused on

different aspects of the topic, it is possible that findings from one method may help to explain or better understand the findings of the other method. Through methodological triangulation, findings may be more clearly confirmed, understanding of the phenomenon of CDM may be enhanced, and validity may be increased (Bekhet & Zauszniewski, 2012). Attempting to integrate findings from both quantitative and qualitative data by using tables and graphs makes for a high quality analysis (Sandelowski, 2003). It also lends itself well to making sound inferences based on the findings (Tashakkori & Creswell, 2007). Use of both qualitative and quantitative methods can provide a more comprehensive view of clinical decision making in baccalaureate senior nursing students.

Survey Research. Survey research involves the collection of information from a sample of individuals through their responses to questions (Blackstone, 2012). Survey research is a useful approach to describe or explain attributes or features of a particular group or groups. It is also beneficial to gather information in anticipation of further research. In this study, online surveys were conducted, thus saving time and money (Blakestone, 2012). Other benefits of survey research includes the flexibility of the instrument itself and the ease in which data collection occurs and is fed directly to the researcher's designated server (Dillman & Christian, 2000). Limitations to conducting survey research include glitches that do occur with the internet; access to email addresses in order to send the surveys; decreased response rates; and/or incomplete surveys.

Focus Groups. Exploring ways in which students make clinical decisions using a focus group further clarified how nursing students perceived they learn and ultimately make clinical decisions (Krueger, 2002). Employing open ended qualitative questions provided perspectives on students' cognitive processes not revealed in the quantitative survey. The Focus Group

Interview Guide can be found in Appendix E. Focus groups provide data more quickly than can be obtained from individual interviews (Stewart & Shamdasani, 2015). Focus groups allow researchers to interact directly with participants and provide added opportunities for clarification and follow-up. In addition, being able to capture non-verbal responses may provide added information, particularly if it contradicts the verbal responses. Focus groups allow connections to be made and for group members to respond, refute, and expand on the sharing of other members.

In this study, conducting focus groups provided a better understanding to how students process a clinical situation and make the decisions they do. This method allowed students to share their feelings, thoughts, understandings, perceptions and impressions (Liamputtong, 2010) regarding decision making. Conducting focus groups with students from a variety of schools was the goal. Since ABSN students tend to be older and have more life experience, as well as a previous degree, their perspective on clinical decisions they have made while in nursing school may be different than the BSN students. Originally, the goal was to have an equal number of focus groups from each program type (ABSN or BSN). However, with graduation and program completion dates, it was impossible to obtain comparable numbers from both groups. Four focus groups were conducted with only ABSN students. Focus groups were conducted until saturation of information occurred.

Focus groups do have limitations. Because the group members are a convenient sample of a larger group, generalization may be limited. Also, group members may respond in a way that is amenable to the rest of the group instead of telling how they really feel or think. Some may not participate at all (Liamputtong, 2010) while others may be more hesitant to share, and yet others may monopolize the discussion. The role of the researcher/ facilitator is critical to

maintaining the flow of the group and not biasing the results through cues or leading questions (Stewart & Shamdasani, 2015).

Setting

The setting for this study was naturalistic, taking place at universities and colleges in the eastern United States. Originally, only schools from one state were included, but in order to achieve an adequate sample size, schools outside of the state were invited to participate. The institutions varied in size from small, private liberal arts schools to large, public state schools. The size of the senior cohort varied from approximately ten to 200. Quantitative data were collected via online surveys from last semester senior baccalaureate nursing students at the schools. For the focus groups, private conference rooms on the campuses were used to conduct the group sessions. It was important that the conference rooms have minimal distractions so that the participants can focus on the discussion (Stewart & Shamdasani, 2015).

Sample

It is difficult to know if the type of baccalaureate program in which students are enrolled affects their decision making abilities. There are numerous ways to enter into nursing (associate degree, diploma, baccalaureate, second degree baccalaureate). In order to remove this threat to internal validity, only students in traditional and second degree or accelerated baccalaureate programs were recruited.

Originally, a two-step sampling process was employed using a random numbers program. First, a random numbers program was used for school selection based on twenty-two schools in one eastern state. Schools were first separated into two groupings, those with accelerated programs and those with traditional programs. Five schools were randomly selected from each grouping and invitations were sent to deans and directors via email (Appendix F). Follow-up

phone calls were made in order to increase interest and answer questions. Seven of the 22 schools responded and agreed to participate.

Second, senior nursing students from those schools were invited to participate via an email invitation sent by their school administrators. Inclusion criteria were: 1) actively enrolled BSN or ABSN students; 2) currently in their final semester of nursing school; and 3) have internet access for survey completion. The only exclusion criterion was those students who already had their license as a registered nurse and were returning to school for their baccalaureate. Being licensed and possibly practicing as a registered nurse could change one's decision making abilities and therefore skew findings. Focus group participants were a subsample of all of the participants and were recruited from the sample of students completing the surveys.

With the end of semester issues, this process elicited a total of only 76 surveys and 1 focus group besides the pilot focus group. Pending the end of semester and upcoming graduations were given as reasons for non-participation. Recognizing that the potential sample was quickly dispersing, and in consultation with the dissertation committee, a decision was made to contact out-of-state schools. School websites were searched and calls were made to deans and administrators to find programs with summer graduating classes of either BSN or ABSN students (Appendix G). In addition, colleagues provided names and email addresses for administrators at various schools across the eastern United States. This process yielded an additional four schools from 3 other states from which to obtain a sample.

A total of eleven schools participated in the study. From these schools, 168 surveys were collected and six focus groups were held, including the pilot focus group. However, at two of the schools, only one student showed up for the session. The session was conducted with

those individuals, but since these interactions were discussions and not focus group sessions, information obtained from these discussions was not included in the analysis.

Size

The power of a test, the level of significance, the effect size and the sample size are interrelated, and must all be considered when establishing the sample size (Gaskin & Happel, 2013). For this study, using F^2 (0.15) for a moderate effect size (Soper, 2015), and a power of 0.8, 91 participants were needed for a powered study (Kellar & Kelvin, 2013). Alpha was set at .05. There were five predictor variables (age, program type, previous degree, previous health care experience and minority status). Ideally, a sample of 30 participants per predictor variable is minimally acceptable (Groves, Burns, & Gray, 2013). In order to anticipate for low response rates and/ or missing data and to take into consideration, the ratio of baccalaureate to accelerated students (3:1), over-sampling by 30% was done to obtain completed surveys from at least 273 participants (Rahman & Davis, 2013). However, a total of only 168 surveys were collected.

Human Subjects Research Considerations

As with all human subjects' research, after IRB approval from UWM (Appendix H) and other participating schools requiring additional approval (Appendix I), clear explanations about the study were given to potential participants (Appendix J), and online consents were obtained for the surveys which were incorporated in the REDCap survey. Written consents were obtained for focus group participation (Appendix J). All participants were informed that their participation in this study was completely voluntary and they could withdraw at any time. Students were assured that none of the data collected would in any way affect their grades or progress in school. In addition, their responses were not linked back to them individually or to their school. Compensation for completion of surveys was the knowledge of assisting nursing

education with the hope of improving nursing student decision making. In addition, at the end of the survey, participants were invited and prompted to enter a drawing to win a \$25.00 gift card. Interested participants had to provide their name and contact email to enter the drawing. This information was kept separately from survey results. After all surveys were completed, a participant was randomly selected to win the gift card.

Compensation for participation in focus groups consisted of food and beverages in exchange for 90 minutes of their time. In addition, participants could enter an additional drawing to win a \$25.00 gift card (in each of the focus groups).

Instrumentation

Two instruments were used in this study- the Nurse Decision Making Instrument-Revised 2014 (Appendix C, Permission- Appendix K) and a demographic survey (Appendix D). Both were collected from each participant via REDCap (Harris, Taylor, Thielke, Payne, Gonzales, & Conde, 2009).

Nurse Decision Making Instrument-Revised 2014

Description. The Nurse Decision Making Instrument (Lauri & Salanterä, 2002) was originally developed as a 56-item scale based on Hammond's (1996) Cognitive Continuum Theory and designed to investigate whether nurses/ nursing students make more analytic or intuitive decisions in practice. Originating in Finland, the scale has been translated into several languages. The instrument is used to determine in general terms how nurses' decision making occurs on the continuum from analytical to intuitive. The instrument was originally structured to include four main stages of decision making: collecting information to define a patient's condition; processing information to define nursing problems; planning and implementing;

monitoring and evaluating nursing interventions and patients' conditions (Lauri, Salanterä, Chalmers, Ekman, Kim, Kappeli, & MacLeod, 2001).

The scale was revised to a 24-item scale after factor analysis (Lauri & Salanterä, 2002). The revised scale maintains the four stages, each with six items. All even numbered items reflect intuitive decision making in unstable tasks or situations with limited time while odd numbered items reflect analytic decision making in structured tasks or situations with enough time to find information or plan actions (Bjork & Hamilton, 2011). An example of a question is "*I look up as much information as I can before entering my patient's room*" (Lauri & Salanterä, 2002).

In reviewing the instrument for possible use in this study, a lack of clarity in the word usage in six of the 24 items became evident, given the Finnish origin of the instrument.

Permission was granted by Dr. Salanterä to make revisions to items 1, 3, 4, 5, 13 and 17 (September 28, 2014 via email-Appendix L) and the scale was renamed the Nurse Decision Making Instrument-Revised 2014. It was imperative that revised items 1, 3, 5, 13, and 17 maintain original meaning after the rewording, which was verified by Salanterä (Appendix L).

Validity. Lauri and Salanterä (2002) created and tested the NDMI, the original 56-item instrument in a pilot study ($N = 200$) with 100 nurses from a Finnish hospital and 100 nurses working in preventive health care in Finland. A rotated factor analysis was calculated for all 56 items which yielded a four factor solution. The four factors were: collecting information for defining patient's condition; processing information and defining nursing problems; planning and implementing nursing interventions; and monitoring and evaluating patient's condition. The factors were orthogonally rotated with Varimax rotation (Lauri & Salanterä, 1995). Only three items loaded poorly and were reformulated. This analysis indicated that the items describing analytical decision making were statistically significant ($P < .01$) with significant positive

correlation with one another ($P < .001$, no stated r value). All intuitive items showed statistically significant association as well. The investigators concluded the instrument had acceptable content validity because the factor analyses yielded similar factors for different data sets.

Construct validity on the 56 item NDMI was assessed by comparing the results produced with the underlying theoretical construct of the Cognitive Continuum theory (Hammond, 1996, Lauri & Salanterä, 2002). The results of this large study ($N = 1,460$) coincide with Hammond's theory.

Parker (2011) performed an exploratory factor analysis in order to examine the construct and content validity of the NDMI (24 items). This resulted in a five factor solution. The five factors accounted for 58.25% of the variance. The intuitive items loaded onto different factors than analytic items with the exception of the fifth factor. The fifth factor had both analytical and intuitive items loaded on it; however there were only three items out of 24 that loaded in the moderate range ($>.5$) with the rest having factor loadings of less than .2. The analytical items were positively correlated to each other and the correlations were significant ($p < .05$). Intuitive items and analytic items were not significantly correlated or were negatively correlated to each other. Parker (2011) concluded the 24 item instrument had acceptable content and construct validity.

Content Validity. With the change in wording on several items, a content validity index (CVI) for the Nurse Decision Making Instrument-Revised 2014 using six experts in clinical decision making (Hulley, Cummings, Browner, Grady & Newman, 2006) was obtained. The instrument used for CVI testing can be found in Appendix L. Items receiving a rating of 3 or 4 are considered relevant to the topic. The CVI-Ave for the scale is 0.92. All six of the revised

items had individual CVIs of $>.80$, indicating content validity for the revised items as well as for the entire instrument. A CVI of $.80$ is considered acceptable (Waltz, Strickland & Lenz, 2010).

Reliability. Reliability scores for the original 56 item instrument were very high ($\alpha = 0.85-0.91$) and the items correlated positively with those measuring the same type of decision making and negatively with the opposite type of decision making. Parker (2011) using the revised 24-item NDMI, obtained a total Cronbach's α of $.84$ ($N = 166$). The Cronbach's α for the NDMI subscales was 0.86 for the analytical subscale and 0.89 for the intuitive subscale. For this study, the overall NDMI internal consistency was 0.90 ($N = 168$). The Chronbach's α for the NDMI-Revised 2014 subscales was 0.85 for the analytical subscale and 0.83 for the intuitive subscale.

Scoring. On the Nurse Decision Making Instrument-Revised 2014, each item is rated from 1 to 5. Scores for all the odd items are reverse scored and then all the scores are totaled. Each item has a five point range of responses from (1) Never or almost never to (5) Almost always or always. Participants are asked to mark the answer that best describes their own action. The lower the score, the more analytic the decision maker is. The higher the score, the more intuitive the decision maker is. The Nurse Decision Making Instrument-Revised 2014 was converted to an electronic survey using REDCap. Lauri and Salanterä (2002) devised cut off scores to differentiate between the analytical, quasi-rational, and intuitive decision making. The cut-off scores are presented in Table 3. The total scores were utilized in this study and have been described according to this table.

Demographic Information Form

The demographic variables (Appendix D) included age, race, program type, previous degree/s, and previous health care work experience. Bjork and Hamilton (2011) found

Table 3
Nurse Decision Making Instrument Scoring

Score Category	Total Score on NDMI	Interpretation of Score
Low	< 67 points	Analytically oriented decision making (Analytical)
Moderate	68-78 points	Flexible decision making/ both analytical and intuitive, depending on the situation (Quasi-rational)
High	>78 points	Intuitively oriented decision making (Intuitive)

Note: lowest possible score is 24; highest possible score is 120

associations in clinical decision making of nurses and their years of work experience, advanced education, gender, age and work setting. Ahmed and Safadi (2013) did not find a link between decision making and nurses' age, gender, educational level or years of experience. Given the conflicting evidence, it was important to examine whether any of these demographic variables relate to how participants learn to make decisions or correlate with the nature of the decisions they make. In addition, understanding the make-up of the participants and their experiences could further clarify their decision making abilities. Gender was inadvertently left off the demographic form.

Pilot-testing

The Nurse Decision Making Instrument-Revised 2014 was piloted with a cohort of accelerated senior nursing students in order to obtain reliability statistics on the revised tool. Also, a pilot focus group was conducted with the same students in order to pretest the interview guide (See Appendix E) and determine if questions need further clarification. Pilot testing ultimately saves time by enabling researchers to work out problems and make adjustments before the actual study (Hulley, et al. 2006). After receiving Institutional Review Board (IRB) approval (Appendix H) for pilot testing the survey and focus group questions, 68 senior nursing students were invited to participate. A total of twelve completed the survey and 6 agreed to be in a focus

group. They were sent the link for the REDCap surveys (demographic section and Nurse Decision Making Instrument Revised-2014).

After completion of the surveys, a group of 6 students agreed to participate in a focus group. This allowed for time to rehearse the questions, format, recording, etc. and also provided valuable feedback regarding process and clarity of the study. From the Pilot Focus group, questions students had and points needing clarification assisted in improving processes prior to beginning research. For example, after being asked to think of a clinical decision they made, students asked if it had to have taken place in the current semester. From that question, the focus group introduction and guidelines were revised to include a statement that the decision that was shared could have taken place any time during nursing school.

From the pilot study, slight changes were made to the survey in the demographic section to add clarity to the responses. Instead of having students write in their school, a list of all schools was provided originally. When out of state schools were added, an option of *Other* was provided with a write-in box for the school name.

Data Collection

Data collection began in March, 2015 and was completed in August, 2015. After receiving IRB approval for the full study from UWM (Appendix H) and the respective schools (Appendix I), the study purpose and plans was reviewed with each interested school contact in order to gain access to the students and the school (Appendix F, J). Understanding how the students' last semester was arranged allowed for appropriate planning when preparing to conduct surveys and focus groups. After getting acknowledgement and approval by school administrators, an email was forwarded to all senior students containing the invitation, the study information, and the survey link (Appendix J). In one case, the administrator provided a listing of

all students' email addresses. It was made clear to all students that participation was totally voluntary, not a part of any of their coursework or grades, and they could withdraw at any time. A two-step data collection process was undertaken. First the surveys were distributed. A reminder email was sent two weeks following survey link distribution. At the end of the survey, participants were invited to participate in the second step of data collection- the focus groups.

Surveys. Students could choose to opt out of participation with no untoward effects at any time during the study. The online survey consisted of a demographic section and the NDMI-14. Although two separate surveys to ensure anonymity, the first survey led directly into the second in order to encourage completion of both. Each student who completed the survey was invited to enter a drawing for one of ten \$25.00 gift cards.

Surveys were conducted via Research Electronic Data Capture (REDCap). REDCap is a secure, web-based application designed to support data capture for research studies, providing 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources (Harris, et al. 2009).

Focus Groups. Focus group participation was solicited at the end of the survey. The final question on the survey was used to invite participants for the focus groups. If a student was interested in participating, he or she was directed to a link in order to provide additional contact information. The goal was to have at least four focus groups from different schools with 6-8 participants in a group. Stewart and Shamdasani (2015) recommend more than one but no more than three or four focus groups. A mutual time and location was arranged for each group with

the help of the school contact administrator. The use of focus groups allowed for the gathering of group perceptions in a nonthreatening way (Speziale & Carpenter, 2007).

Focus groups lasted 1.5 hours in length and all were recorded and transcribed. Groups varied in size from three to 10 participants. Three of the 28 participants were men and all participants were from accelerated BSN programs. Focus groups at participating schools were conducted until saturation was reached, noted through repetitive themes and iterative responses (Marshall & Rossman, 2006). The aim was to include as many participants as necessary to gain a comprehensive understanding of the phenomena of CDM (Speziale & Carpenter, 2007). Focus group sessions were held after completion of the survey. To capture the words, thoughts and feelings through dialogue offers a glimpse into the lives and minds of others. Sample focus group questions are found in Table 4 and the entire guide, including an opening script is in the Focus Group Interview Guide- Appendix E.

Table 4
Sample Focus Group Questions

Think about a clinical situation you have had during school in which you made a clinical decision. This could be during any semester during the program.

Would anyone like to share their situation?

What thoughts went through your head while you were making the decision?

What happened after the decision was made?

Tell me how you came to the decision.

Where did you learn to make that decision?

Are there other things about that patient experience that you want to share?

Patton (2002) described the importance of voice, perspective, and reflexivity of the researcher. That voice must be credible and worthy of trust, realizing that pure objectivity is

impossible and pure subjectivity destructive. Practicing this with the pilot group was essential to prepare for the research group. Also, scripting an opening introduction allowed for consistency while still introducing the discussion in a realistic and sincere manner. Seeking out balance and understanding, while depicting the world authentically was essential. Listening is the most important skill in the interviewing process (Seidman, 2006). Interviewers must listen for substance and the meanings within words, while remaining aware of the process.

Five constructs must be considered when conducting qualitative research (Guba, 1981). These are criteria for evaluating the integrity of a qualitative study. They are *credibility*, *dependability*, *transferability*, *confirmability*, (Guba, 1981; Marshall & Rossman, 2006) and *authenticity* (Schwandt, 2007). Lincoln and Guba (1985) have described *credibility* as one of most important factors in establishing trustworthiness or rigor. A number of strategies were used to ensure that the findings were correct and the reporting was truthful. Maintaining field notes for each focus group provided consistent information gathering (Table 5). This, along with recordings and transcripts solidified the findings. In order to maintain *credibility*, the study was conducted as planned.

Dependability is an important criterion that refers to the stability of the data over time and in other conditions (Marshall & Rossman, 2006). By clearly describing how the study was conducted, how participants were enrolled, etc, future researchers may be able to replicate the study and obtain similar findings. Peer review of findings and triangulation of data established the *dependability* of the study. Data were triangulated (Speziale & Carpenter, 2007) in this study to ensure objectivity and *confirmability* (Creswell, 2009). An iterative process of first confirming meaning during sessions, then reviewing audio files/ transcripts and field notes after each session was utilized in order to begin to discover themes. Linkages and connections were

made with fieldnotes when the recordings were listened to promptly after each focus group. While listening to the recordings, notes were made regarding the tone of the discussion, including pauses, enthusiasm, disagreement, etc. This, along with the notes taken during the actual focus group, helped led to theme and subtheme recognition.

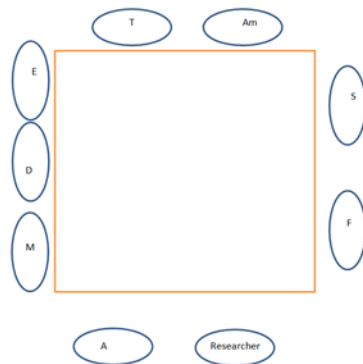
Transferability means that findings could have applicability in other groups or settings. By giving enough descriptive data about the sample and the process, others could replicate and examine the applicability of findings in a different context. It was important to examine and interpret the data in order to elicit meaning, advance understanding, and develop practical knowledge (Corbin & Strauss, 2008). Through iterations of listening to recordings and reading transcripts, several codes surfaced. The codes were grouped according to commonalities and relationships. During the third focus group, the concept of intuition or instinctual behavior was discussed. Therefore, a fourth focus group was added in order to seek out new themes. Saturation was reached and only repeat codes were noted. Through the group description and notes provided, it may be possible for other researchers to study senior BSN students and reveal similar findings.

Confirmability implies that findings could be substantiated by another person, which in turn would make similar inferences and interpretations (Marshall & Rossman, 2006). In order to ensure *confirmability* throughout the focus group sessions, peer examination of the transcripts by two colleagues not associated with the study allowed for an unbiased review. Both colleagues reviewed written transcripts, asked clarifying questions, and provided written feedback. Looking at students from several different schools (space triangulation) allowed for a comparison of data based on characteristics of the various schools and cohorts. Methodological triangulation allowed for examination of quantitative survey results and qualitative focus group results and

may provide better clarity and understanding of findings (Speziale & Carpenter, 2007).

Authenticity refers to the process of providing genuine, actual findings without regard to subject matter (Schwandt, 2007). In other words, data shared do not just reflect positive, or happy events, but rather all viewpoints are presented and so a full view of the findings is provided. This is evident in the quotes shared from focus groups in which students had negative interactions with other team members.

Table 5
Field Notes Guide

Date/ Time	School #2	Field notes
02/01/15 4:00pm	8 participants  (diagram of seating in room with participant initials and location of researcher)	Everyone contributed Student 1-A became upset about a time a decision was made that hurt the patient. Student a shared how she learned to know information that helped her make the decision.

It is critical that personal perspectives are not interjected on others' thoughts and words through bracketing. Bracketing is the process of putting aside the beliefs and judgments of self in order to be open to the ideas and opinions of the participants (Speziale & Carpenter, 2007). This is done by first examining and acknowledging self-beliefs about the topic and then setting them aside for the study. Bracketing begins before beginning data collection and continues throughout data management and analysis. Journaling one's thoughts and opinions about CDM

prior to and throughout the study allowed conscious awareness of self-beliefs while remaining open to the ideas and beliefs shared during data collection (Speziale & Carpenter, 2007).

Appropriate locations at schools were confirmed with school administration prior to holding the focus group. The rooms had minimal distractions and were private enough that others did not interrupt. Sitting in a circle or around a table where everyone can participate and see each other is the ideal arrangement for an interactive focus group (Stewart & Shamdasani, 2015). All rooms contained round or rectangular tables so everyone could be seen.

Noise and physical distractions like posters and windows can be very disrupting. Participants were comfortable and provided with a non-cluttered space, comfortable chair and adequate personal space. It was important to have an environment conducive to sharing and discussing openly. Creswell (2009) encourages flexible questions with the researcher consciously keeping participants focused and directed by specific follow up questions for redirection. Questions explored clinical decision making and fit the participants' experiences (Charmaz, 2006).

Food was provided, taking caution to screen for food allergies and dislikes prior to the session. Each participant was given a name tag for first names so that group process was organized and maintained during the focus group by calling on people to talk if needed. This ensured that all group participants had an opportunity to share. Lecuyer (1975) found that interaction in focus groups was more intense in a small room than a large room.

Data management

All data were housed on a secure server. Data from the demographic survey and the Nurse Decision Making Instrument- revised 2014 (Lauri & Salanterä, 2002) were entered into a password protected database. Data were backed up regularly onto a second, secure site. To ensure data accuracy, data were cleaned by first checking for outliers and missing data

(Tabachnick & Fidell, 2007). If outliers were found, data from the original surveys were reviewed and reentered as needed. As an additional safeguard, the frequency distributions of all variables were checked before proceeding with the analysis. One survey was discarded when it was found to have inappropriate data and responses (Age-81 with a RN degree and yet no previous college degrees; all survey responses were 1).

Descriptive Statistics are included in Chapter 4, Table 11 with each of the predictors. Because of strong skewness (2.1) and kurtosis (5.2), age was initially transformed into two categorical variables-Younger (< 30) and Older (30-50). After the bivariate regression, the age variable was transformed to a rank score set (1-155) due to skewness. The other variables were coded into binary indicator variables as described. Under the variable previous degree, only three (1.9%) had an Associates' degree and 1 (0.6%) had a doctoral degree. This variable was also transformed into three sections: 0 = High school or equivalency; 1 = post-secondary; and 3 = master's and above. The Previous Degree variable was coded into 0 = high school or equivalency, 1 = post-secondary, and 2 = master's and above. The number of Hispanic participants was small (n = 10) as well as several of the race categories. For this reason, these variables were transformed into one variable called Minority with 0= non-minority and 1 = minority including Hispanic. The Program Type variable was coded into 0 = non-ABSN, 1 = ABSN; while the Previous Healthcare Experience variable was coded into 0 = none, 1 = yes.

After completing a focus group, a transcriptionist converted audio tapes to written transcripts and the audio tapes were securely stored electronically for further exploration. Transcripts were organized according to date and time. In addition, field notes corresponding to that focus group were created and linked to the audio file.

Data Analysis

Data analysis of a mixed methods design enables researchers to be more likely to capture the essence of the phenomena (Creswell, 2009), in this case, Clinical Decision Making. Analysis will be described here in reference to each of the three research questions.

Research Question #1. *How do last semester senior baccalaureate nursing students perceive they learn to make clinical decisions?*

This question was answered by analyzing the focus group data through thematic analysis. Thematic analysis is a method which can work both to reflect reality, and to unpick or unravel the surface of ‘reality’ (Braun & Clarke, 2006). Their work describes a very clear and concise methodology for analyzing data from a thematic perspective. This includes six phases: becoming familiar with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report.

Becoming familiar with the data. Analysis began during the collection of data and required listening and notetaking. Changes in voice and body language were also noted. After the sessions, immersion into the tapes; listening while examining notes helped to make the data more familiar. Memo writing also took place.

Generating initial codes. Reviewing memos, transcripts, and field notes led to the generation of initial codes. Reduction of the data occurred through coding. Throughout the process, codes were combined with other codes and/or renamed for better clarity. All the transcripts were entered into a software program (NVIVO-
http://www.qsrinternational.com/products_nvivo.aspx).(2012).

Searching for and reviewing themes. Once codes were entered, combined and/or renamed, themes emerged. These themes were then reviewed and examined for commonalities, overlaps, and inconsistencies. Notes were taken as to areas where data can be integrated with the findings

from the survey. It was at this point that subthemes surfaced and noted (Table 6).

Table 6

Examples of Quotes and Theme Selection

Quote	Selected Phrases	Theme
So I had ---- as a clinical instructor and like always, it was always taught to us and like instilled in us to always advocate for your patient, no matter like who yells at you, what's said to you, what's done, what isn't done. If it gets you, if you have to go through twenty people and you still get nowhere like you still try to advocate for your patient. So that kind of like gave me like the kick and the courage to say what I needed to say.(2-JE)	So that kind of like gave me [the kick] and the courage to say what I needed to say.	Finding One's voice
So I've seen a lot in practice like people doing things not because of professor voices, and sometimes professor voices plus experience with things. But I feel like it's the first time where a lot of people have been confident like, 'I know things. I'm good and I can bring something to the table.' Like you were saying, 'I have a perspective that matters.' And I think that we've so blessed to have like preceptors and professors that draw that out of us and say, "You are not just- just a nursing student. What you say matters. (1-D)	I have a perspective that matters	Becoming Confident
...but in the end it's about the patient and so I had to remind myself that. And it's always good to like approach the nurse or whoever with the question like, "I don't know if this is right but I'm just thinking" so that you're not like overstepping decision making. But yeah just kind of approach it like that. (3-SA)	...but in the end it's about the patient	Patient-Centered Care-The Real Priority
I mean I do have a lot more autonomy in preceptorship, obviously I mean my preceptor trusts me with two of our three babies. (group laughs) Which is kind of like, 'What?' And then of course they're both just bradying and desatting. But for me I felt like - more that switch was flipped where all of a sudden it was like, 'Oh wait. I can take care of one patient by myself and like actually not completely freak out over it and think that I'm doing something wrong all the time.(1-A)	But for me I felt like - more that switch was flipped	The Turning Point

Defining and naming themes. Six themes were identified and named in a way that described the meaning and sentiment of the participants. The producing of the report is actually the formulation of the written description and tells the story.

Research Question #2. *What is the nature of the decisions that last semester senior baccalaureate nursing students make?*

Research question 2 was answered through descriptive statistical analysis of the results of the Clinical Decision Making Instrument-Revised 2014, as noted in Table 7. Analysis of results from the surveys determined if the participants' answers reflected analytic, intuitive or quasi-rational clinical decision making. The total scores on the Nurse Decision Making Instrument-Revised 2014 have been described. In addition, Nurse Decision Making Instrument-Revised 2014 scores and candidate predictors were described using frequencies, percentages, mean, minimum, maximum, and median across the continuum. The lowest score, or most analytical was 59 while the highest or most intuitive was 82.

Research Question #3. Which of the following predictor variables (age, program type, previous degree/s, previous healthcare experience, and minority status) are related to the way students make clinical decisions?

Univariate frequencies and descriptive statistics were done (Table 11, (Kellar & Kelvin, 2007). After ensuring data were clean, variables were named appropriately and outliers examined and corrected when needed. Bivariate regression analyses were conducted to look for significant relationships between the predictor variables (age, previous degree/s, previous healthcare experience, program type and minority status) and the NDMI-14 total score.

Predictor variables were checked for multicollinearity in order to determine which variables and in what order they should be entered into the hierarchical multiple regression formula. There were small, negative correlations between the NDMI-14 scores and age, program type, previous degree/s and minority status. There is essentially no relationship between NDMI scores and having previous healthcare experience ($R = .01$). Having previous degrees has a strong, positive relationship with age ($R = 0.55$, $p = .001$) and program type ($R = 0.67$, $p = .001$). The older someone is, the more likely they are to have previous degrees and be in an accelerated

BSN program.

Table 7
Analysis Method to Answer Research Questions

Research Questions	Data	
	Quantitative	Qualitative
1. How do senior baccalaureate nursing students perceive they learn to make clinical decisions?		<ul style="list-style-type: none"> - Bracketing - Focus group responses <ul style="list-style-type: none"> · Data grouping · Labeling, coding - Processes shared <ul style="list-style-type: none"> · Themes · Field notes
2. What is the nature of the decisions that senior baccalaureate nursing students make?	Descriptive statistics <ul style="list-style-type: none"> - NDMI-14 scores - Total individual score - frequencies, percentages, mean, median, mode, and ranges - Average score for each school - Analysis of total scores based on the range (Table 3) provided by authors 	
3. Which of the following predictor variables (age, program type, previous degree/s, previous healthcare experience, and minority status) are related to the way students make clinical decisions?	Descriptive and Inferential statistics <ul style="list-style-type: none"> - Multiple regression to predict relationships between total score on NDMI-14 - Age - Baccalaureate program type - Previous degree/s - Previous healthcare experience - Minority status 	Explore demographic data and look for relationships with focus group themes

Hierarchical multiple regression was chosen so that predictor variables could be entered in a particular order based on theoretical understanding of the variables as well as the results of the bivariate analysis (Meyers, Gamst, & Guarino, 2006). The goal was to discover which of the predictor variables are statistically significant with CDM.

Missing Data

Demographic and survey data was inspected for missing values. Determining if there was a clear cause for the missing data, such as unclear directions, misinterpretations in the process, etc. was difficult to do because of having online surveys. Seven participants who

completed the survey but not the demographic portion were retained. Other sporadic demographic data were missing but with no pattern or obvious reason was evident so these participants were retained and none of the missing data were replaced or imputed. For example, under healthcare work experience, twenty-one participants left that blank. As these missing data did not impact the overall purpose of the study (Hulley, et al. 2006) all remaining data was retained and analyzed.

Chapter Summary

The methodology for studying clinical decision making in last semester senior baccalaureate nursing students has been described in this chapter. Demographic variables were discussed. Instrumentation including the Nurse Decision Making Instrument-Revised 2014 was described. The processes used for sampling, preparing the setting, data collection and analysis were described. Statistical analysis methods used for the quantitative data were described and the thematic analysis used for the qualitative data explained.

Chapter 4

Results

The purpose of this study was to examine the ways in which last semester senior baccalaureate nursing students perceive they learn to make clinical decisions and to determine the nature of the decisions they make. In addition, possible relationships between clinical decision making and the predictor variables (participants' age, baccalaureate program type, previous degree/s, previous healthcare experience, and minority status) were explored. Hammond's Cognitive Continuum Theory (Hammond & McClelland, 1980, Hammond, 1981) provided the theoretical framework for the study.

In this chapter, the findings from the current study are presented. All three of the research questions are answered in this chapter. First, a summary of the demographic statistics will be shared. Then, question one will be answered with the results of the qualitative portion of the study, including focus group transcripts, thematic analysis and coding. Questions two and 3 are answered by the results of the quantitative survey through descriptive and inferential statistics. The chapter will conclude with a synthesis of the results.

Demographic Description

One hundred and sixty eight last semester senior baccalaureate nursing students completed the NDMI-revised 2014, although only 155 provided information about age. The mean age was 26.34 years ($SD = 5.517$), with the youngest being 20 and the oldest 50 (Table 8).

Table 8
Sample Characteristics (N = 155)

Characteristic	N n	Percentage
Program	149	
BSN	56	37.6
ABSN	105	62.4
Ethnicity	147	
Hispanic	10	6.8
Non-Hispanic	137	93.2
Race	147	
White	117	79.6
Black	26	10.9
Asian	4	2.7
Other	4	2.7
Refused	6	4.1
Previous Degree	160	
High school or equivalency	36	22.5
Associate	3	1.9
Bachelors	106	66.3
Masters	14	8.8
Doctoral	1	0.6
Healthcare Experience	147	
No	61	41.5
Yes	86	58.5

Qualitative Results

Question 1: How do last semester senior baccalaureate nursing students perceive they learn to make clinical decisions?

This question was answered by examining perspectives and ideas shared during the focus group sessions. Six major themes emerged from the data. They were **Partners in Learning, Finding One's Voice, Becoming Confident, Multiple Sources of Learning, Patient-Centered Care (The Real Priority), and The Turning Point**. There are clearly overlapping ideas that fit into more than one theme. The themes, although interconnected, each described unique ways in which the participants learned to make clinical decisions. Four of the themes contained subthemes as noted below. Additional topics also emerged and are identified (Table 9). Quotes are labelled with the number of the focus group (1-4) and a one letter identifier for the participant, i.e. **(2-G)**. The six themes that emerged from focus group discussions all seemed to be relevant to how students learn to make clinical decisions. They also highlighted decisions that

Table 9
Themes and subthemes from Focus Groups

Partners in Learning	Finding One's Voice	Becoming Confident	Multiple Sources of Learning	Patient-Centered Care (The Real Priority)	The Turning Point
Clinical Instructors Staff Nurses Preceptors Faculty	Clinical instructor role modeling	Time to process	Resources Curriculum Classroom Lab Clinical		
		Additional topics Emotions Body language Difficult situations			

are made for specific purposes. Thus, the central, connecting concept has been named **Coalescing For Action** (Figure 4). Coalescence is the coming together or uniting for a common end (Merriam-Webster, 2015). The codes and subthemes identified developed into themes. These themes come together or coalesce to contribute to the way nursing students make decisions and further develop into nurses. The themes may combine or coalesce when students making decisions. For example, when a student becomes more confident, he/she finds his/her voice and speaks up to make the decision. In the same way, using the resources available allows for better patient-centered care in decision making. The action students take, then, is personal and professional growth as a clinical decision maker.

As they develop as nurses, they bring with them their previous knowledge, experiences, and decisions. For some situations, they will have enough experience or recognize sufficient cues and patterns to quickly make a decision. For other situations, no amount of experience would prepare them and so they must seek out the details- search for cues and methodically determine what decision needs to be made. Students need to bring all their school experience with them into practice. This is explained in part by the combined sphere to the right in Figure 4. This sphere represents all the ways of making clinical decisions the student has used which become part of who they are as a nurse. This sphere is not static, but rather dynamic and malleable for they will not use all for every decision but will pull out what they need for any given patient situation. It is here, then that quasi-rational decision making makes sense. Decision making needs to be situation-specific, based on what the nurse knows, what the nurse has previously experienced, and what is recognized and what is not clear. Each of the themes contributes to the overall concept. Each of the six themes will be discussed in more detail here.

Coalescing For Action®

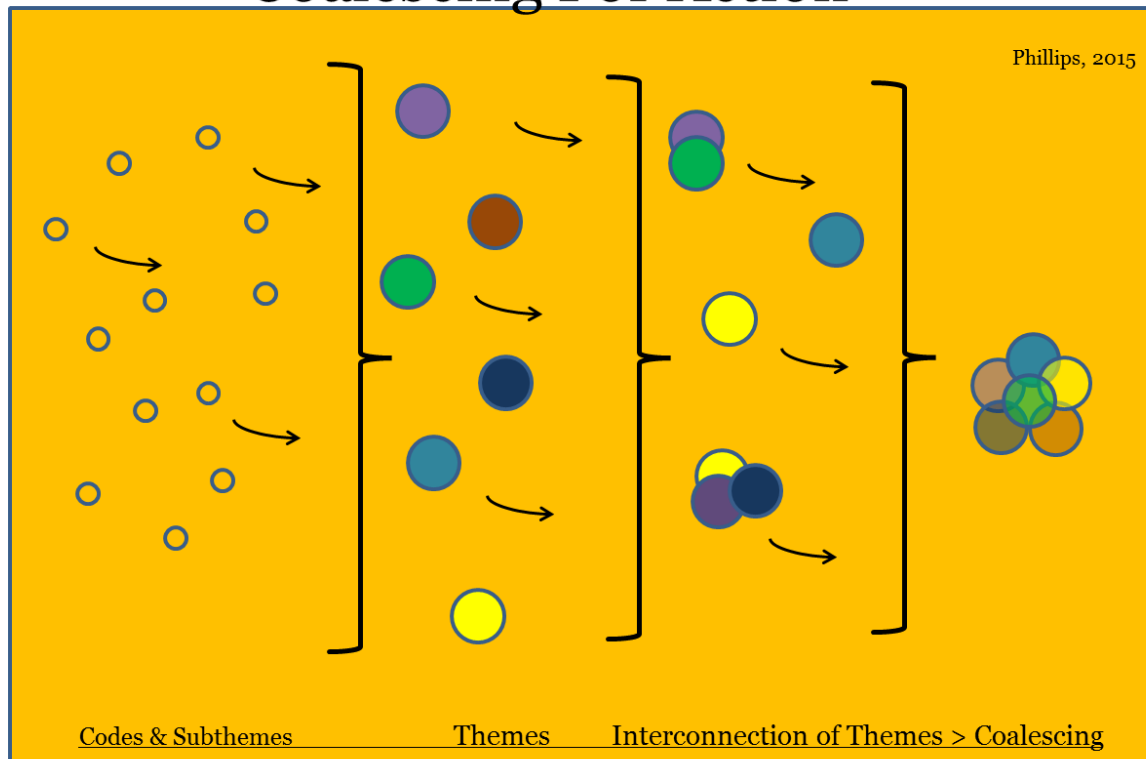


Figure 4 Coalescing For Action

Partners in Learning

Participants frequently talked about people who helped them learn to make clinical decisions. This included **clinical instructors, staff nurses, preceptors, and faculty**. These partners provided direction, guidance, support, and constructive criticism, which all helped the students make clinical decisions.

Clinical Instructors. By far, the role of the clinical instructor (CI) was the most influential and critical to their clinical decision making abilities and growth. “I mean I think CIs in general are so crucial to the learning process because they are that kind of middle man between student and actual nurse” (3-NA). One student was initially frustrated by the CI because she wanted an answer or help with a solution. Instead,... “Mine was the CI saying like, ‘What do you think

you should do?’ And that’s what pushed me to be like, ‘What should I do? What would I do?’ You know and that pushed me to make the decision that I made” (1-TA).

The following statement demonstrates how the questioning of the CI led the student to consider multiple dimensions of patient care when making decisions about medication administration.

And they [CIs] definitely rose to the occasion of challenging me like for meds they wanted me to know why I giving this med? Just because it's on the chart does not mean anything. What about your patient is [important]- what diagnosis does your patient have- [why] recommend this drug? What’s the protocol like policy? ...my CI was very big about policy. You need to look up your policy cause she said, “A lot of the nurses on the floor may not know policy.” And so you don’t want to be caught saying, “Oh well the nurse told me to do it this way.” (3-JA)

Another participant shared how her CI helped her learn to make clinical decisions:

And also my CI like is- was always such a great resource. ...cause I felt like I could mess up and they would guide me or you know and there was no judgment with your CI. And they’re also your advocate too, so that’s what I really appreciate about CIs and they would like help me or like be my voice as well. If there’s something going wrong they would push for me too. (3-SA)

This participant worked through her thinking with her CI and answered questions until she arrived at an action item, or decision:

I spoke to my CI and we kind of- she made me go through like why was I concerned? Why is this the issue? And then she made me- she said, “What would I need to do next?” And so we- I said, “I’ll go through his medical records like his notes and find out okay what was the actual care plan?” And when that came up I had even more questions about

the care plan, because it wasn't really answering the question. She's like, "Okay what's your next step?" And I was like, "Talk to the NP or whoever's in charge." And she's like, "Well she's on the floor. Let's go talk to her." So I felt like she was there more as a [guide], more than anything- than to actually- she wanted me to get in the habit of actually talking to the right people that I needed to talk to. And being comfortable with having those discussions, cause she said "sometimes you feel nervous doing that" and so I appreciated that she listened to my concerns and she also said, "Okay what's your next step?" And kind of helped me through that. (3-JA)

Staff Nurse. The staff nurses on the units played a role in the students' decision making experiences. Participants shared both positive and negative comments regarding the nurses with whom they worked. "But what I will say is you definitely see a difference with the nurses who love to teach students like they- I think and so they come and find you" (3-JA). Another participant shared the following: "But ah, I had a situation where I was working with a nurse who- as she put it she's like, 'I'm just here till retirement, not really checked in. Don't really care'"(4-DE) Her body language appeared strained and facial expression showed alarm. Regarding a situation in which the physician ridiculed a young pregnant mom for being pregnant:

[The nurse] she didn't say a single word. She was a seasoned nurse and I told my clinical instructor you know what nurse was in there and she said, "Yes, she's very shy." Even though she's been there for like twenty years too.... In like a horrible situation, she had nobody there. (2-MA)

Again, this was a very alarming event for the student. The student felt helpless and yet very angry, stating "I just wanted to take him out back and punch him in the face" (2-MA) (referring

to the physician). His voice was raised during this discussion and his body language appeared tense with hands clutched into fists. Finally, one participant said: “And all nurses are not teachers”. (2-HE)

Conversely, participants shared that when the nurse included them in to huddles and report, they felt more a part of the team and willing to step out and share their perspective, make a decision. Regarding a conversation between a staff nurse and a student:

And that was the one thing when I first met them they told me like, ‘What are some things that you want to work on? What are some things- like what’s your style of learning?’ And they definitely rose to the occasion of challenging me like for meds they wanted me to know why I giving this med? (3-JA)

But what I will say is you definitely see a difference with the nurses who love to teach students like they- I think and so they come and find you. But then I also think they find which of the students are open to learn. Like I feel like because I was always asking questions I was always up like, “Oh, what are you doing? You’re changing a bed. Oh I’ve never changed a bed, let me help you.” Or, “Oh, this patient needs what? Okay I’ll do that I’ll get ice and stuff.” They came and where like, “Oh like she to just do- she just wants to be in that experience. She wants to see it all. There isn’t anything that she will say, “no” to really.” So they come and find you because they see that excitement and a lot of the nurse’s say- I’ve heard them say about the student nurses like- there’s a passion there for us. Like we want to do stuff. And they’re like, “Don’t lose that passion. Cause a lot of nurse’s end up losing it. But you want to learn, you want to be involved. Don’t lose that, cause that’s honestly that’s what you want on a floor is a team player who’s willing to help you out in different things.”(3-JA)

Preceptors. All participants had some type of precepted experience in which they worked directly with a staff nurse and a group of patients for an immersive time. These experiences varied in length and time but all were in the final semester which meant that some were experiencing it at the same time they were participating in the focus groups. Here, a participant describes how she began to feel comfortable and able to question decisions through her interactions with the nurse during the preceptorship:

Mine was a lot of –based on my preceptor’s interactions with me in the past. She’s a previous college grad and she’s so receptive to what I have to say and she lets me collaborate with her. She’ll be like, “Don’t forget to remind me to turn the lipids back on.” Or, “Don’t forget to do this.” And, “Remind me to do this.” And if I catch something that is done wrong, like one time she didn’t connect the IV tubing to the central line and I was like, “Oh is that supposed to be connected?” (group laughs) She’s always like, “Oh great catch, great catch. Thank you so much.” And it’s never like punitive. She never says like, “How dare you call me out.” Or, “How dare you tell me I did something wrong.” And I’m- I’m always trying to be nice about it but she’s always very receptive. So when then happened I didn’t feel uncomfortable going to her (1-D)

Examining her growth from one semester to the next and noting the increased autonomy with decision making during the precepted experience was enlightening to this participant:

I went from gero to nursing I’m a totally different person- just in a semester. ...totally different person from gero to nursing than from my preceptorship to nursing. Because I’ve had to do a lot of things myself. You know my preceptor was always there but I was able to step out the box (sic) and do different things. (1-TA)

Here, through the trust and support of the preceptor, the participant describes increased confidence, finding her voice, and recognizing her abilities at clinical decision making:

...my preceptor had let me be the charge on one of our two assignments and really trusts me to take care of everything and she'll kind of check-in with me but she'll let me plan my day and my priorities. And I feel like I've been so much more challenged and that's made me understand how much I have to give and how much I've learned over this program. ...cause once you're challenged and you can like come up with answers and set priorities on your own you're like, 'Oh I do know this.'(1-D)

Challenging the student while providing support created an open, inviting atmosphere in which the student could make decisions without fear of intimidation:

My preceptor- she is awesome. She's not intimidating so I always feel like I can go to her and instead of her like babying me and being like, "Okay well I'll take this information and I'll go say something." She allows me to go through all of the processes. So she let me (be) the one to say what I had to say instead of me being like (JE whispers) "By the way can you go say something to the doctor?" She allowed me to do the entire process of the situation. So she's- she was another person who was just like pushing me to advocate for the patient.(2-JE)

Faculty. Participants commented on hearing various faculty members' words in their head during a clinical situation. One recalled:

I was going through like my initial assessment and I remember I don't know if it was you who said it or it might have Dr. name or something; oh no it was Dr. name. She said, "Lethargy is bad." And I remember- I remember that and I, like this woman was clearly lethargic and it was early in the morning so I was kind of expecting it but, just something

about her presentation was off. Um, and I knew nothing about her. And I just kind of went on what I had learned- it kind of merged together. (1-L)

Here, the participant learned to back up clinical decisions with reasons:

I think (professor) told us all the time- it's like, "I just want to know that you have something to back up the reason why you made that decision." And I think that's the hugest part (3-NA)

Through faculty stories, this participant described decision making as quasi-rational, fluctuating "based on the day". This gave her a sense of comfort in her own development and growth as a nurse:

But then I will also say like the professors hearing their own personal stories kind of helps me know that you're not always gonna be 100%. (JA laughs) You're always gonna be learning, you're always- your decisions are always gonna fluctuate based on your patient, based on the day- based on anything. So like hearing their stories gives me comfort in knowing that even though I may not be where I think I am- compared to the first semester I'm way further than I thought(3-JA)

Finding one's voice

Many times, participants described situations in which they were able to speak up in a way that was new to them. They seemed to have found their footing and their place as a patient advocate through their voice. They learned to make clinical decisions by challenging situations when needed, and interjecting their own viewpoint based on what they learned and knew.

And so I like fought for contacting the doctor and like telling them what's going on cause he was supposed to get a paracentesis and he was waiting for like three hours and they just wouldn't come and they kept on saying, "Oh, we'll come at this time" and then that

time came and it passed..... so that made me really happy and I feel like if I didn't like fight for that they just would have left him there. (3-SA)

JE emphasized the importance of being a patient advocate regardless of the treatment received:

So I had ---- as a clinical instructor and like always, it was always taught to us and like instilled in us to always advocate for your patient, no matter like who yells at you, what's said to you, what's done, what isn't done. If it gets you, if you have to go through twenty people and you still get nowhere like you still try to advocate for your patient. So that kind of like gave me like the kick and the courage to say what I needed to say. (2-JE)

1-D described how support and trust from others affected her decision making:

So I felt really supported to like make my own decisions, she trusted my decision and I felt like I could talk to her about it without any reprimand or anything like that. (1-D)

Having an instructor that pushed the students often gave them the impetus to make decisions:

I think as far as like our- like for me at least- the decision making all came from my clinical experience. Like my first clinical I sat there and said nothing and did nothing but it was because my clinical instructor didn't say we could say anything. Like never told- you know let us know it was okay to do things or to just take the initiative to say or do something. And then as the semester progressed and I did more clinical- having someone who like pushed me to advocate and like let me know like that there aren't any boundaries like in a sense. Then I felt more inclined to speak up and...I don't know if that makes sense. (2-JE)

A participant mentioned trust again and said:

She really trusted that I meant what I said and that I did try my best and she wasn't even in the room but she trusted that I had done what she had asked me to do and that I really did feel like there was more that could be done. (1-D)

Another shared: "But I think it's kind of like what SA said, like it's about the patient. And at the end of the day I didn't want my closed mouth to cause a problem for the patient." (3-JA)

In the same group, JA shared:

But yeah I felt really proud of myself because I was like, 'It looked strange to me.' And I just- I felt like because I spoke up and asked it as a question like, "Oh, I don't really understand this." She was like, "But because you asked that question you forced us all to look and see why he was on it and nobody could really tell you really he was on that much liquids. (3-JA)

This led NA to describe another aspect of decision making:

Like you can teach anybody this task-oriented stuff it's learning how to think in a way that differs from just, 'I need to do this task.' It's like thinking- forwardly thinking, getting the whole picture, and I think that's made the hugest impact in terms of my learning and critical thinking in making those decisions. Because it gives you a little more of the confidence, even if you're not right you thought through it and you can say, "I came to a slightly different conclusion" whether or not it's wrong or not. But you have that like, 'I made that decision because I thought it was the right decision at that time.' (3-NA)

Recognizing the power of that voice, one participant shared:

I felt pretty good and I was like- it was confirming to me like, 'I think I'm in the right field.' (group laughs) But um, and that my opinion matters and that um you know when

there's an emergency I can kind of trust things that I've learned and how that plays together with how to react. (1-T)

The support of a peer helped to find that voice:

I had a peer with me in the room. It was ____; I don't think she'll care if I use her name.

But um, yeah it was- it was like, "Do you think this is hypoglycemia?" "I don't know do you think its hypoglycemia?" And it was just like a back and forth like a tennis ball.

And um, and then we just kind of talked through it and it just got to this point of like, "Okay one of us stays. One of us goes and gets our CI." Get a third party involved. But um, it was awesome to have a peer in the room. (1-C)

And that's why- this semester especially if I don't understand something I'm like, "Can you explain to me like why we're doing an EKG on this patient if they have stomach pain?" Kind of just talking out loud has been a big- a big stepping stone whereas in Foundations I was like, 'Okay don't breathe too loud, something is gonna happen.'

(group laughs) Because I had no idea what the heck- what was gonna on. (1-T)

Becoming Confident

Realizing the importance and scope of the nurse's role and the way in which nurses can affect patients' lives was conveyed in comments about confidence or lack thereof. When confident, participants began making clinical decisions, questioning others' decisions, and actively participating in patient care. One participant shared: "I doubted myself and I didn't want to- I was afraid to like make myself look stupid." (3-SA) While another said: "So it felt good to actually make a good decision and be right." (1-L)

This next comment was in response to how you become confident in the role:

But (CIs) also giving you confidence because as a student nurse you kind of don't always know what your role is like; how much power do you have? How little power? And so sometimes you're stuck and they try to give you more confidence in your voice and saying, "Yes, you are a student but you are a new set of eyes." So you are actually helping the nurse, you're not a hindrance on the nurse. You are actually improving this patient-care. (3-JA)

Another shared how the CI provided support while encouraging self-reliance:

My CIs have allowed me to kind of- and also my nurses- I've had nurses where they said, "You do your own assessment I'll do mine. We'll compare at the end." Or, "Okay you're gonna do this med and you're gonna go through the steps with me while we're in the patient's room" and stuff like that. And kind of just made me- the patient became my own, like this was my patient and especially with reporting. I used to hate nurse report. (some laugh) But it started in maternity; our CI was like- before we could do anything with our patient we had to give a report on our patient. (3-JA)

When helping a laboring mother achieve comfort through repositioning and massage, this participant shared: "But I'd say this particular experience was the only time I felt maybe a little – not arrogant but just like very self-assured in what I was thinking" (3-NA).

The concept of confidence was important and students shared different ways of their experience with it: "I'm confident that this is what I want to do for my patient and I think with that experience I also have the confidence to go and advocate for my patient." (4-BA) Another eye-opening comment on a sense of self:

So I've seen a lot in practice like people doing things not because of professor voices, and sometimes professor voices plus experience with things. But I feel like it's the first

time where a lot of people have been confident like, 'I know things. I'm good and I can bring something to the table.' Like you were saying, 'I have a perspective that matters.' And I think that we've so blessed to have like preceptors and professors that draw that out of us and say, "You are not just- just a nursing student. What you say matters. (1-D)

Another shared ways in which their confidence is deflated by staff:

I don't know how much this is based (on) just like us as a personality or kind of the culture of the unit. So like for example in maternity- didn't feel welcome, um and I don't know if that was just kind of an underlying like, 'You're a male, why are you here?' kind of a thing or if it was just- how all the nurses happened to be. Like they weren't mean but it was just kind of like indifferent. (3-NA)

Here, a participant describes the benefit of iterative experiences in clinical in boosting her confidence:

And then she'll have a list of questions like, "Oh, why did you say this?" Or, "What kind of meds?" And then you're like, "Oh my gosh, I didn't look this up." But it helped me as I got- every week I felt like I was getting better. So when I got to like adult health, pediatrics, taking report wasn't as nerve-wracking as it was in maternity. And giving one I actually was more confident and so yeah I feel like the CI's and the nurses definitely did a great job in just building skills, making me more comfortable with stuff. (3-JA)

Realizing the value of the nurse's role, another said:

I would leave the room during rounds because I felt like a non-essential person and I said that one time and I had a CI get mad at me and I realize now why they were mad. Because we **are** essential like- what we see matters and especially now that we have all

this experience like- all of these situations we had a positive outcome with the patient and that's huge. (1-D)

Finally, a participant linked her experience on her last shift to her growth and sense of who she was becoming:

Well I- so my preceptorship- love it. But my last shift that I did over the weekend I got- I'm in hospital's ICN and I was given charge of two babies of our three babies assignment and it was like- like I went home and I was like, 'Wow I felt like a real-life nurse today.' (1-A)

Another participant shared how confidence was built, even in the midst of mistakes:

...they kind of give us that confidence to be able to be like, "You're budding in that authority, use it. Use that knowledge that you have. Be confident in that." So they're very encouraging and sometimes its like- or I don't know the resource to go here. I'm not- you know I haven't been oriented like jobwise to this unit or whatever so they're kind of a good middleman to be like, "Oh, you should go talk to this person. Oh, you should do this." They're good at kind of directing you where you need to focus your attention which helps a lot. Um, and definitely the ones that let you feel your mistake a little bit, those- instead of like excusing it or, "It'll be fine. We'll take care of it." That kind of a thing or not like really hound you on it but kind of like, "You know you kind of screwed up. But it's not that bad for this and this reason. This is what you can do next time to make sure that this doesn't happen." So they still make you feel your mistake but then they give you positive feedback afterwards. And so it's like, 'I learned. I felt it.' And then you can kind of move on and you don't wallow in that like, 'Oh I really messed up' (3-NA)

Multiple Sources of Learning

Many participants shared specific tools or places in which they learned to make clinical decisions. This included resources, curriculum, classroom lessons, lab experiences and actual patient care experiences. These **Sources of Learning** solidified their cognitive abilities while giving them the evidence for decisions they made.

Resources. “So **Up-To Date** is my best friend and so are other resources on the computer like hospital intranet, I really find those to be helpful. Cause it's- they don't have emotions, you can just go (some laugh) and consult” (3-SA)

When asked about where they learned to make clinical decisions, one participant shared:

I guess like yoga class. (some laugh) Gave me- like level and grounded cause I understood that I was upset. But like you said if I acted on that anger um, you know (*mumbles*) and age probably you know the age myself since I'm thirty. (MA laughs) If I was younger if I was like twenty-three and in that situation I probably would have spoke up.... (3-MA)

Another participant couldn't pinpoint one specific resource, but shared several:

I would say that my intuition at least comes from a mix of resources. It's definitely having that medical knowledge to pull from- to have actual like reason that you're- that like a particular thing is- or you see a red flag, whatever. And definitely I would just say from general past experience in my life... And definitely the base knowledge like from the textbook and of course yeah like my intuition and using that judgement that really, really helps just like top it all off. (2-SA)

Curriculum. Understanding where students learned to make clinical decisions is parallel to how they learn it. Participants recalled moments during class, lab and clinical where they

recognized some concept or content they were taught and its applicability to their growth. “I would say more of my nursing assessments stuff kicked in and trying to reason through what could possibly be going on without like looking at any of his labs or anything at that point.” (4-JA) While in lab, students learn how to perform skills and simulate caring for a patient. How that knowledge and skill gets transferred to a real clinical situation is not always clear. One participant shared:

I feel like the CI has helped me so much in transferring the- like the skills that we learn in lab into actual practice. Because what I’ve have found, or at least for me is that even though the lab does help get familiar with the materials it is in no way like it is in the hospital and there are so many different variables and for every skill or you know lab procedure that we learn there is like a billion different things behind that- that we don’t learn in lab. So for instance, when I was changing an ileostomy bag. I knew the basics and like I knew the parts to the bag and everything but like there all these lotions and creams and all this different stuff. And like tricks that you could do in order to make it easier, that I would not know unless I had a nurse or a CI teach me. (4-D)

Classroom. Lessons were also described when answering how they learned to make clinical decisions:

Through this really detailed case study and it was fantastic. Um, and not only for the clinical understanding but also like you told a story at the very beginning about when you were a nursing student and you made a mistake and you like ran down the hallway- (group laughs) even-even that kind of a story is so valuable to hear because it helped me to go through the program, If I make a mistake it’s okay...every nursing student does this. (4-LA)

One participant summed up her learning by the following example:

Kind of the same things that they said like lectures, intuition, critical thinking, but I also thinking like having conversations with the nurses I've had. On past clinical experiences- like they can- you may not even be talking about your particular patient but they talk about another patient and things of that sort and you kind of just pull knowledge from things that they've said that kind of stuck in your head. Like for pediatrics I had DKA patient and I remember she was on IV fluids and they took her off. And she's like, "Well now you need to make sure that she's actually drinking on her own. ...Cause she doesn't have fluids running." And so that stuck to me for some reason like, Oh, okay so someone who isn't necessarily on IV fluids you want to make sure that they're getting the fluids that they need.(3-JA)

Another shared about classroom learning: "Pharmacology was part of it and just knowing you know how you know narcotics especially work on the body, some of their side effects" (3-NA)

Here, a participant links her intuition back to the resources she used for learning:

I would say that my intuition at least comes from a mix of resources. It's definitely having that medical knowledge to pull from- to have actual like reason that you're- that like a particular thing is- or you see a red flag, whatever. And definitely I would just say from general past experience in my life um, is one of the things that I draw from and like NA said um, just like how would you treat yourself? Or like how would you try to alleviate your own- you know like the medical experiences you've had in the past? And ah, yeah so I just think it's like a mixture of different resources that sort of draw onto it. (3-SA)

Here, one participant compared decision making to learning how to assess: “Like assessing, you know really like nailed that into my brain of like assess” (I-C). Or this student who recognized her knowledge through an emergency situation: “My opinion matters and that um you know when there’s an emergency I can kind of trust things that I’ve learned and how that plays together with how to react.”(I-T)

Blending of resources with faculty voices helped this student learn to make clinical decisions:

So some base knowledge, a little bit of intuition, and a little bit of critical thinking I guess, kind of all combined and then just having (professor’s name) in your head, (some laugh) telling you, you know remembering what she said or whatever during class. So kind of a plethora of resources I guess. (3-NA)

Here, the participant shared how valuable hearing about professors’ past clinical experiences helped:

I would say definitely lectures, not just like- not just information that you read from the book because anyone can do that and you know get the facts and the numbers and what not. But like actually going through and hearing the professors past experiences and their stories about patients like really helps me put it all into context whether or not it's even related to my patient because I feel like a lot of time-one experience can also help a different experience, even though it's not the same one. So yeah it's definitely- you get a lot of the information just from like hearing the- being in class and listening to the lectures. And definitely the base knowledge like from the textbook and of course yeah like my intuition and using that judgment that really, really helps just like top it all off.(3-SA)

Here, a participant described her retrieval of previously learned knowledge:

Kind of the same things that they said like lectures, intuition, critical thinking, but I also thinking like having conversations with the nurses I've had. On past clinical experiences- like they can-you may not even be talking about your particular patient but they talk about another patient and things of that sort and you kind of just pull knowledge from things that they've said that kind of stuck in your head. (3-JA)

Lesson from the Lab. "So I definitely learned from our time in lab, when we were listening to the lung sounds of the mannequins on different settings to recognize something abnormal." (4-ME)

This participant shared how a lesson from lab informed her clinical decision making:

I just knew he was having trouble breathing based on how he looked and then I recalled from previous classes- probably back to health assessment and lab and stuff um, what to do if people are having trouble breathing and elevating the head of the bed just like popped into my mind. (4-CA)

Clinical Experiences. Clinical experiences helped this participant become more confident in her decisions:

I'm gonna second the experience that was going through some other's minds. That I think with more clinical experience because this did happen my third semester. So with more clinical experience I think I had more confidence in that, 'Okay this is what- my instinct' (4-BA)

This participant articulated multiple ways of making decisions while in clinical:

I think there are four places that- where I gathered information from- the first I am gonna say instinct, it sounded like there was something caught in her throat. And that's like a normal human thing that I would have identified I think. The second was from health assessment was her O2 SAT was dropping and I knew that-that was wrong from that

class. The third is pediatrics, we learned about trachs, and trach care. Um, and the fourth was from my experience previously in the day- when the same thing had happened and I had watched what the nurse had done then. (4-LA)

Patient-Centered Care (The Real Priority)

Participants shared moments when they realized how important the patient was to the process. They talked about prioritizing the needs of the patient above all else and many recalled being taught to focus on patient-centered care. Keeping the patient first allowed them to proactively make clinical decisions and take risks:

We are always taught patient centered care you know and you always talks about patient safety first. And we'd have to- you know- as long as you're staying patient focused then it doesn't matter the outcome. You know you can't be doing anything wrong if you stay patient focused. (1-TA)

Another shared:

..at the end of the day like are your patient's advocate and I think that that has really helped me drive like a lot of my decisions like it doesn't really matter what- well I mean it does matter what other people think but at the end of the day no matter what you are advocating for your patient. So I always think that's helpful (4-BR).

This participant described her focus on the patient while trying to explain her position:

...but in the end it's about the patient and so I had to remind myself that. And it's always good to like approach the nurse or whoever with the question like, "I don't know if this is right but I'm just thinking" so that you're not like overstepping decision making. But yeah just kind of approach it like that. (3-SA)

This participant maintained a patient focus and felt accomplished and happy about it:

So I felt like it reassured me that as long- what we've been taught like as long as we keep the patient in mind, that's what's most important. So I felt like for me more than anything I just felt happy that the patient was able to get on the meds that he needed to be on and he obviously looked better and was able to be discharged that day. So I felt like really proud of myself. (3-JA)

When referring to a system-wide medication computer glitch that was caught by the student: "I didn't know how huge making that catch was" (2-K). When the participant shared this story, only one other student knew what had happened and cheered the student on from across the room. He shared that the hospital presented this student with an award for his work on correcting this error. The rest of the group reacted; one girl reached over and patted the student on the back and congratulated him. Even after the focus group session was done and the tape was turned off, students came up and acknowledged what he had done.

The Turning Point

In every focus group, participants discussed the turning point when they realized they knew more than they thought they did; or they didn't process their decision in the same laborious way as in the past. Some mentioned intuition and instinctual action. This Turning Point gave the students the sense of readiness, the confidence they needed, and the realization that they are equipped to make clinical decisions for and with their patients:

And um, it wasn't until this semester that I started to see myself as a nurse which is kind of funny. And I'm sharing this with you because it's been a recent kind of development of just that transition and how important that is and how I need to take myself and my contribution to patient care seriously and I wish I would have known that in the middle of the summer. (1-T)

Another said:

I think a lot of it is just from past experience and having maybe done something or thought about something I guess- enough times that it's just like- we call it intuition but I guess it's not technically intuition. More as just an educated not guesswork but educated reasoning. You know you do it so many times you know- you just know. 'Hey if you're vomiting like, let's stop the vomiting.' (3-NA)

Recognizing one's growth and gradual steps towards independence:

Yes but my preceptor was there and I knew she wouldn't let me give- you know I was like leaning on my CI. I was leaning on my CI for a lot of stuff. But now it's like I feel like it's on me. Now that I'm doing it- so I'm like yes- I'm looking at the blood pressure, the blood sugar you know? (group laughs) You know and it's like- and it kind of expanded my thinking on how to do things. You know so I think that um, yeah the preceptorship by itself- that- yeah- that just it took me to a whole different level. (1-TA)

This brief exchange between four participants in the first focus group helps to convey the theme:

C: Yeah preceptorship kind of gives you ownership of your practice.

TA: Yeah you like see it-

A: That's a turning point-

L: Cause you don't have like other students to lean on- or a CI to lean on.

Here a participant describes this turning point uniquely:

Like for the first time, but then it's like over my clinical experiences in the last two semesters- really I think since adult health like there are things or like certain thought processes that like subconsciously come to me. It's like, 'Wait, when did I start thinking like that?' (1-A)

This participant describes a feeling that led her to question and determine her next course of action:

I had class, lecture and things- but I think also it's just like something didn't feel right and for me when something kind of bugs me I have to find out what it is. And so I think that was one of the biggest things like- I didn't know 100% sure what it was, but it was bugging me and I knew the only way to relieve that- I needed to ask questions or I needed to figure out what it was. So I think you may not 100% know how to name it, define it, but you have that feeling where you're just like, 'I need to investigate this cause it won't leave me alone, that feeling.' (3-JA)

This participant continued on as she processed how she learned to make the decision:

Yeah, I definitely- because it always stuck in my mind. Cause when she said it I was like, 'Oh well that makes sense.' It's something so simple that she said. It wasn't like ground breaking, but I'm like, 'Oh, that makes sense.' And then when I saw him I was just like, 'Oh, that really does make sense.' (Eyes opened wide and smiles). But yeah you just never- I think like you never as we've said like things that professors have told us- we kind of hear it and we store it and we don't realize that we store it until we see a situation and we're like, 'Oh someone did mention that in class. I wonder if I could pull from what they said and see if it applies here or maybe if I could tweak what they said.' Or it gives me something to investigate even more into. So yeah, you just never know what somebody says- how it stays in your mind. (3-JA)

The next participant described the automaticity of clinical until she realized her abilities and autonomy.

Because I felt like this summer was so much and like I went to clinical and I was like almost like going through the motions. I was like- assessment with labs, have everything for handoff and talk to your patient- stuff. But it was like I almost felt like half the time it was like eleven weeks of like just going through a twelve hour shift. But then starting clinicals third semester it was like all of a sudden it was different for me, anyway. I mean I do have a lot more autonomy in preceptorship, obviously I mean my preceptor trusts me with two of our three babies. (group laughs) Which is kind of like, 'What?' And then of course they're both just bradying and desatting. But for me I felt like- more that switch was flipped where all of a sudden it was like, 'Oh wait. I can take care of one patient by myself and like actually not completely freak out over it and think that I'm doing something wrong all the time. It's just I find it odd how quickly, since obviously this is a sixteen month program- how quickly my um, thinking has switched from like ____ and I were talking earlier from like check-offs and vital signs and like head to toe to like- (group laughs) like what is going on with my patient? Oh these are the like most recent labs and possibly going on? You know and if you told me that this time last year that this where I would be I probably would think you were crazy. (1-A)

Additional topics

All groups were interactive with some participants' sharing leading to others' recalling and adding to the topic. Some were in the clinical setting together and acknowledged experiences with head-nods and/ or comments. During two of the focus groups, eye-rolling was noted by one person after several comments were made by the same participants. Although valid, some of the sharing was redundant from a previous question. The speakers were redirected in both cases with the next question or a guiding statement.

Many emotions were shared during the focus group sessions. Some participants shared very disturbing, difficult situations in which they were present when a patient was given bad news. They had to decide whether to stay or leave the patients' room. Frequently, the focus group room became still and the sharer's voice dropped.

This next exchange involved participant PA from group 2. Visually, this participant's shoulders and head dropped as if he or she was reliving the experience all over again.

I witnessed something that really it will probably stay with me the rest of my life. I was in taking care of a patient. The doctor came in, said to the patient, "Hi Mr. So and So, I just want to let you know we got your test results back and it looks like you have colon cancer. Do you have any questions?" The patient was so dumbfounded because it just came out matter of factly (sic). I think he was in shock for at least ten minutes. The doctor looked at him, no conversation transpired. "I'll talk to you tomorrow after we determine what we're gonna do."

Researcher asked: "And left the room?"

Walked out and left. The guy's in shock. I see tears coming down his face. (pause-dropped head and shoulders). That was hard. You know that was hard to watch. I just pulled up a chair and just held his hand because I was in shock myself. And there's somebody sitting on the other side of the curtain. Very emotionally, she said:

I just think as a student it's kinda hard cause you like want to speak up but at the same time you don't really know like your place and I feel like I would have done the same thing because it's like- I feel like any doctor could just be like, "Well who do you think you are? You're just like a student? You're not a nurse. So but then at the same time it's kind of like well, 'What's the worst thing that happens if you get yelled at?' You said

something so but it is- it's kind of just like- like MA said you don't want to put like a bad taste in someone's mouth and then it's like, 'Of all those students the next time they come we're not gonna let them see anything. Because of like- who do they think they are? (2-PA)

The participant who shared earlier about a physician reprimanding a young pregnant patient followed up on the story with this sobering recollection:

The reason I didn't say anything was because of the RN who was in room, I just figured she was eventually going to speak up to the doctor in defense of you know of her patient. And you know when she didn't I was like- I thought- for a second I thought about chasing after him and being like, "That was very rude of you to say that to her. She's a human being just like me and you." Um, I just- I feel like now I feel like I still should have done that, so I kinda feel bad. (2-MA)

Summary of Qualitative Findings

The six themes described all point to ways in which the participants learned to make clinical decisions. Coalescence of these aspects of their CDM development inspires action on their part; to embody these ways into their decision making abilities as a nurse.

Quantitative Results

Research Question #2: *What is the nature of the decisions that last semester senior baccalaureate nursing students make?*

Descriptive statistics were computed for the Nurse Decision Making Instrument-Revised 2014. One hundred and sixty eight surveys were completed. NDMI scores in this study ranged from 59 to 82 (mean = 70, SD = ± 3.9). One hundred and twenty-seven (76%) of the participants scored in the quasi-rational decision making category. As Lauri and Salanterä (2002) described

this category, it is both analytical and intuitive, showing flexible decision making based on the situation at hand. Thirty-nine (23%) participants were in the analytically oriented category, while only two (1%) were in the intuitive category. Cut score categories set by the Lauri and Salanterä (2002) from Table 3 were examined and are described in Table 10.

Table 10
Total Scores, Mean and Median of NDMI-14 Based on Categorical Range (N=168)

NDMI-14 Categories	N (%)	Mean (SD)	Median
Analytically Oriented Low (< 67)	39 (23.2%)	65.18 (2.3)	66
Quasi-rational Moderate (68-78)	127 (75.6%)	71.35 (2.5)	71
Intuitive High (>78)	2 (1.2%)	81 (1.4)	81

Research Question #3: *What predictor variables (age, baccalaureate program type, previous degree/s, previous healthcare experience, and minority status) are related to the way students make clinical decisions?*

Descriptive statistics of the predictor variables and the NDMI-revised 2014 scores are found in Table 11. Students in ABSN programs tended to have slightly lower NDMI-14 scores, demonstrating more analytical decision making ($m = 70$, $SD = 1.1$) than BSN students ($m = 71$, $SD = 3.4$). As participants got older (ages 30 – 50), they tended to have slightly lower NDMI-14 scores as well ($m = 69$, $SD = 5.1$) than the participants who were under 30 years old ($m = 70$, $SD = 3.6$). Lastly, minority students including Hispanics tended to have slightly lower NDMI-14 scores ($m = 69$, $SD = 4.2$) than non-minority students ($m = 70$, $SD = 3.8$). There was no difference in NDMI-Revised 2014 scores between those with and without previous healthcare experience ($m = 70/ 70$, $SD = 3.5/ 3.9$).

Table 11

Descriptive Statistics with the NDMI-Revised 2014 for Each Predictor Variable

Predictor Variable	n (%)	NDMI Mean	SD	Min	Max	Median	Kurtosis	Skewness
Age								
Younger (<30)	129 (83.2)	70	3.6	59	80	70	.361	-.277
Older (30-50)	26 (16.8)	69	5.1	60	82	68	.541	.579
Program type								
BSN	56 (37.6)	71	3.4	62	80	71	.241	.244
ABSN	105 (62.4)	70	1.1	59	82	70	.314	-.131
Previous Degree/s								
High school or equiv	36 (22.5)	71	3.2	66	80	71	.187	.583
Post-secondary	109 (68.1)	70	3.8	59	77	70	.114	-.433
Masters and above	15 (9.4)	70	5.5	61	82	70	.409	-.125
PHE*								
No	61 (41.5)	70	3.5	60	77	70	.661	-.402
Yes	86 (58.5)	70	3.9	59	80	70	-.123	-.117
Race minority or not								
Non-minority (white)	121 (77.6)	70	3.8	59	82	70	.616	-.143
Minority**	35 (22.4)	69	4.2	60	80	69	.297	.147

*PHE = Previous Healthcare Experience

**Minority including Hispanic

Bivariate regression analyses were conducted to determine the extent to which each of the proposed predictor variables (age, program type, previous degree/s, previous healthcare experience, and minority status) influenced the NDMI-14 total score (Table 12). Bivariate regression was performed for each predictor. The level of significance was set at $p = .05$ (2-tailed). However, any predictor variable with $p \leq 0.10$ (2-tailed) was retained for inclusion in the multiple regression analysis in order to cast a wider net when looking for relationships, as p values may change in context to other predictors.

Table 12
Bivariate Regression Results: Predictors of NDMI-14 Total Scores

Predictor	r	r ²	Unstd. B	SE B	Std. β	t	df	P
Age Rank	.14	.019	-.012	.007	-.139	-1.734	1	.09
Program Type	.15	.022	-1.19	.635	-.148	-1.881	1	.06
Previous Degree/s	.15	.022	-1.04	.554	-.148	-1.880	1	.06
Previous Healthcare Experience	.01	.000	-.049	.625	-.006	-.078	1	.94
Minority Status	.14	.019	-1.26	.742	-.136	-1.704	1	.09

The findings from individual bivariate regression showed that previous healthcare experience was not related to the way clinical decisions were made ($\beta = -.006$, $P = 0.94$). Thus, this variable was not retained for multiple regression analysis. Both program type and previous degree/s showed the same variance ($\beta = -.148$, $p = .062$) and so the previous degree/s variable was not retained for the multiple regression analysis either. Age, program type, and minority status were retained for the multiple regression (all $p \leq 0.10$). None of the variables, however, made a significant contribution in predicting NDMI scores ($p > .05$). All VIF scores were ≤ 0.6 , indicating a lack of multicollinearity.

Hierarchical multiple regression analysis was used to assess the ability of four variables

(age, program type, and minority status) to predict the type of decision making score found on the NDMI-14 scale (Table 13). Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity.

Table 13
Multiple Regression Analysis: Predicting NDMI-14 Total Score.

Variable	r	Adjusted r^2	Unstd. <i>B</i>	<i>SE B</i>	Std. β	Model P value	Parameter P-value	Statistical Power of Model
Model 1	.139	.019				.09		.27
Rank Age			-.012	..007	-.139		.086	
Model 2	.168	.028				.11		.40
Rank Age			-.008	.008	-.091		.312	
Program Type			-.848	.713	-.107		.236	
Model 3	.211	.044				.08		.59
Rank Age			-.008	.008	-.093		.300	
Program Type			-.765	.711	-.096		.284	
Minority			-1.150	.726	-.127		.115	

Age was entered first, explaining 1.9% of the variance in the NDMI-14 scores. After entering program type, the total variance explained by the model as a whole was 2.8% ($p = .11$). Model three explained 4.4% of the variance as a whole ($p = 0.08$) but was not significant.

Additional Analyses

Because some language modifications were made to the instrument, and because this was the first time this instrument was used with students, a factor analysis was performed on the 24 items (including the 12 reverse scored items) of the NDMI-14 (Table 14). There were 168 surveys returned. The following criteria were inspected to check the appropriateness of using factor analysis with the data: a correlation matrix determinant value between 0 and 1; Bartlett's

test of sphericity ($p < .05$); the Kaiser-Meyer-Olkin test (KMO value $> .60$, Tabachnick & Fidell, 2007). A factor analysis was performed on the 24 decision making items using a principal components analysis, using a varimax rotation. No items were eliminated based on factor loadings at a moderate level ($\geq .40$). Using Scree and Kaiser methods (including a minimum eigenvalue of 1.0), a meaningful solution with five factors resulted, accounting for 57% of the variance (Meyers, Gamst, & Guarino, 2006). All five components had at least 5 items with factor loading $\geq .40$. Five conceptually meaningful parallel constructs were identified and labeled: (1) Planning patient care-10 items; (2) Data Collection- 8 items; (3) Nursing Action-7 items; (4) Data Understanding-5 items; and (5) Confidence in Decision Making- 6 items. Reliability of the components using Cronbach's alpha. The standardized alphas for each factor were: (1) Factor 1 = .860; (2) Factor 2 = .839; (3) Factor 3 = .814; (4) Factor 4 = .761; and (5) Factor 5 = .727. These results have the potential for creating five factor-based subscales and are consistent with the results from Parker's (2011) analyses.

Table 14

Factor Analysis for the Nurse Decision Making Instrument-Revised 2014

			Component				
	Item	Descriptors paraphrased	1	2	3	4	5
Planning patient care	ndmi1	I collect as much information prior to beginning care.	.618				
	ndmi3	I specify all the items I intend to monitor and ask about before beginning care.	.522				
	ndmi9	I compare information I have received with research knowledge about the nursing care and its impacts.	.610			-.530	
	ndmi13	I devise the patient's nursing plan according to the stages of the nursing decision-making process.	.459		.602		
	ndmi17	I set target goals for the patient's care that are easy to measure.	.681				
	ndmi18	I anticipate the impacts of nursing interventions on the patient.	.574	.464			
	ndmi19	I follow as closely as possible the patient's existing nursing plan for his/her disease and situation.	.555				
	ndmi20	I anticipate changes in the patient's condition on the basis of individual cues even before there are any clear symptoms.	-.496	.438			
	ndmi21	I use specific information about the treatment of the patient's disease when making decisions about nursing care.	.507				
	ndmi22	I flexibly change my line of action on the basis of feedback on the patient's situation.	-.472				
Data collection	ndmi6	It is easy for me to make a distinction between relevant and irrelevant information in defining the patient's condition.		.602			
	ndmi10	It is easy for me to see which pieces of information are relevant to defining the patient's nursing problems.		.644			
	ndmi12	It is easy for me to form an overall picture of the patient's situation and major nursing problems.		.690			
	ndmi14	I base the patient's nursing plan on my own nursing views and/or the patient's views on his/her care.		.414			
	ndmi16	I document without difficulties the general directions concerning the patient's care to the patient's records.		.475			
	ndmi18	I anticipate the impacts of nursing interventions on the patient.		.464			
	ndmi20	I anticipate changes in the patient's condition on the basis of individual cues even before there are any clear symptoms.		.438			
Nursing action	ndmi24	It is easy for me to assess the impacts of my actions on the patient's condition.		.642			
	ndmi5	I confirm the impression I have formed from information collected by searching for symptoms that support my views.			.483		

Table 14

Factor Analysis for the Nurse Decision Making Instrument-Revised 2014

			Component				
	Item	Descriptors paraphrased	1	2	3	4	5
Nursing action	ndmi6	It is easy for me to make a distinction between relevant and irrelevant information in defining the patient's condition.			-.492		
	ndmi11	I define the patient's nursing problems objectively on the basis of the symptoms and complaints observed.			.701		
	ndmi13	I devise the patient's nursing plan according to the stages of the nursing decision-making process.			.602		
	ndmi15	I base the patient's nursing plan on the general regimes prescribed for the patient's disease.			.710		
	ndmi16	I document without difficulties the general directions concerning the patient's care to the patient's records.			-.513		
	ndmi21	I use specific information about the treatment of the patient's disease when making decisions about nursing care.			.458	.471	
Data understanding	ndmi7	I compare information I have received about the patient with my earlier knowledge of similar individual patients' cases.				-.703	
	ndmi8	I compare information I have received about the patient with my own experiences in nursing practice.				.781	
	ndmi9	I compare information I have received about the patient with research knowledge about the nursing care and its impacts.				-.530	
	ndmi21	I use specific information about the treatment of the patient's disease when making decisions about nursing care.				-.471	
	ndmi22	I flexibly change my line of action on the basis of feedback on the patient's situation.				.451	
Confidence in decision making	ndmi2	I rely on my own interpretations when it comes to defining the patient's condition.					.645
	ndmi4	I make assumptions about potential nursing problems during the first contact with the patient.					.720
	ndmi5	I confirm the impression I have formed from information collected by searching for symptoms that support my views.					-.549
	ndmi14	I base the patient's nursing plan on my own nursing views and/or the patient's views on his/her care.					.448
	ndmi19	I follow as closely as possible the patient's existing nursing plan for his/her disease and situation.					-.422
	ndmi23	I try to find reasons for my own observations of changes in the patient's condition.					-.402

Summary of Quantitative Findings

Quantitative analyses revealed no statistically significant findings among the predictor variables and CDM. Previous healthcare experiences had no relationship to CDM while age, program type, and minority status all had an inverse relationship.

Factor analysis results on the NDMI-14 resulted in five conceptually meaningful parallel constructs which have the potential for creating five factor-based subscales.

Chapter Summary

The data were analyzed using both qualitative and quantitative methods. Research question one was answered through the focus group transcript interpretation and thematic analysis. Quotes and words from participants were used to add depth and richness to the findings. Research questions two and 3 were answered through descriptive and inferential statistics, including a multiple regression and factor analysis.

Chapter 5

DISCUSSION, CONCLUSIONS and RECOMMENDATION

Introduction

The purpose of this study was to examine the ways in which last semester senior baccalaureate nursing students perceive they learn to make clinical decisions and to determine the nature of the decisions they make. In addition, possible relationships between clinical decision making and the predictor variables (participants' age, baccalaureate program type, previous degree/s, previous healthcare experience, and minority status) were explored. Hammond's Cognitive Continuum Theory (1980, 1981) provided the theoretical framework for the study. Three research questions were answered in this study.

1. How do last semester senior baccalaureate nursing students perceive they learn to make clinical decisions?
2. What is the nature of the decisions that last semester senior baccalaureate nursing students make?
3. What predictor variables (age, baccalaureate program type, previous degree/s, previous healthcare experience, and minority status) are related to the way students make clinical decisions?

In this chapter, a summary of the study is presented followed by discussion of the findings. Limitations of this study are described. Implications for education, practice, research and policy are explored. Recommendations for future studies are also discussed.

Summary of the Study

Clinical decision making (CDM) is an integral part of what nurses do (Muir, 2004; Ramezani-Badr, Nasrabadi, Yekta, & Taleghani, 2009). However, inspection of the nursing literature reveals concerns about the lack of preparation and readiness of new nursing graduates to engage in effective clinical decision making (Benner, Sutphen, Leonard & Day, 2010;

Duchscher, 2008, Gillespie & Paterson, 2009, , Noohi, Karimi-Noghondar, & Haghdoost, 2012; Smith & Crawford, 2002). This study was conducted to better understand the nature of students' decision making and how they learn to make clinical decisions. Nursing students in their final semester of a baccalaureate program participated in this mixed methods study. Data were collected from 168 students at 11 schools in 4 states. Twenty-eight of these students also participated in focus groups. Hammond's Cognitive Continuum Theory provided the conceptual underpinnings for this study. Hammond's (1988) CCT posited that, as tasks become more difficult and/or the decision maker has less knowledge and experience, decision making becomes a more analytic process. Decisions can be retraced and justified because they are well thought out and mapped through knowledge and forethought. Conversely, if a task either requires a quick solution or is quite simplistic, and/or the decision maker has more knowledge and experience, decision making becomes a more intuitive process. Two areas of clinical decision making were examined: understanding how senior nursing students learn to make clinical decisions; and determining the nature of the decisions they made.

Question 1 (*How do last semester senior baccalaureate nursing students perceive they learn to make clinical decisions*) was answered using focus groups. Six themes emerged from the focus group data: **Partners in Learning, Finding One's Voice, Becoming Confident, Multiple Sources of Learning, Patient-Centered Care (The Real Priority), and The Turning Point.** These six themes were interrelated, leading to a core concept of **Coalescing for Action** (See figure 4). Question 2 (*What is the nature of the decisions that last semester senior baccalaureate nursing students make?*) was answered using descriptive statistics. Question 3 (*What predictor variables [age, baccalaureate program type, previous degree/s, previous healthcare experience, and minority status] are related to the way students make clinical*

decisions?) was answered using descriptive and inferential statistics, namely bivariate and multiple regression analyses.

The NDMI-14 was used to determine the nature of the students' clinical decision making. A factor analysis was done on the NDMI-14 because of several items being revised. The internal consistency of the NDMI-14 scale was 0.90.

The average student was white, 26 years old, and from an accelerated BSN program. Although ages ranged from 20-50, 25 was the median. Over half had previous healthcare experience and 9 % had a master's degree or above. No statistically significant results were obtained for questions 2 or 3. Having previous healthcare experience was not related to the way these students made clinical decisions.

Research Question 1

How Students Perceive They Learn To Make Decisions

Students perceived they learned to make decisions through a combination of several factors, all of which coalesced to enhance their clinical decision making skills. A **Coalescing for Action** (Figure 4) describes this core concept.

There are several possible reasons for these findings. Gaining knowledge about the clinical environment, the patient care needs and the role and responsibilities of the nurse are essential for students. Similar to Tanner's (2006) clinical reasoning model, educated thought and making connections back to previously learned information aids the students. As they gather more cues about the situation at hand, they begin to make judgments (Lassater & Nielsen, 2009) about what needs to be done. However, this must be in the context of a particular patient situation (Benner, Hughes & Sutphen, 2008).

The guidance and direction from clinical instructors and others is needed and is consistent with findings by Haigh and Johnson (2007). Clinical instructors play a key role in the development of the nursing students as professionals and as competent decision makers. Students often looked at patient situations as unique until the CI helped point out how that situation linked to others they had in the past. Having a supportive environment to learn in also encourages and helps to facilitate their growth as competent decision makers (O'Mara, McDonald, Gillespie, Brown, & Miles, 2014). Moreover, supportive environments facilitate the speed at which they learned to make clinical decisions. However, having supportive clinical instructors supersedes the importance of a supportive environment according to Carlson and Idvall (2014).

Students seemed to be unaware of their own thinking and processing of information until someone else challenged them to reflect on how they arrived at the conclusions they did. They did realize that resources helped them to make clinical decisions. Decisions about what to do in a conflict situation or ethical dilemma were more difficult and powerful than clinical care decisions.

When clinical instructors helped them think through and determine what clinical decisions they needed to make, students reported that they learned better. However, the courage to speak up and advocate for the patient was still difficult. This seemed to be because of fear of making a mistake, or looking stupid. The fear of making a wrong decision or possibly getting ridiculed for attempting to make a decision often prevented them from finding their voice. Becoming more confident in one's abilities and finding one's voice were important times of growth in the students. As noted by several researchers (Kumaran & Carney, 2014; Sharif & Masoumi, 2005). Believing that their contribution to a decision was valued by those around

them as well as believing they were making the right choices effected their actions. Clinical instructors who listened and questioned students without immediately giving them the answers enhanced their learning and their inquisitiveness (Potgeiter, 2012).

Students reported that when their clinical instructor was too easy or “mothering”, that did not help them learn how to make clinical decisions. Although they initially appreciated an easy instructor, over time they realized it did not help them grow as a nurse. They found they wanted to be challenged and held accountable while still being supported. This is consistent with Perry’s (1970) theory on intellectual development in college students. As students gain knowledge and experience, they become more accountable for their learning and decision making. Encouraging more accountability from an earlier point in the program may aid in students’ decision making abilities.

Penn, Wilson & Rosseter (2008) described the important role clinical instructors have in shaping the professional values of nursing students. Participants discussed how some clinical instructors demonstrated professional values through communication and role modeling. Role models can both positively and negatively influence students. One instructor helped a student problem solve how to prioritize patient problems and decide how to report findings to the provider. Another instructor shared personal stories from her nursing school and ways she learned to make decisions. Interjecting these strategies into curricula may help students’ decision making.

Decision making was enhanced by the methods clinical instructors used to guide and direct students. The way a clinical instructor asked questions, or displayed confidence in the students, helped them arrive at a decision. These findings corroborate the studies done by Rowbotham and Owen (2015) on the effects of the clinical instructors on students’ self-efficacy,

as well as the study by Valiee, Moridi, Khaledi, and Garibi (2015) on the effectiveness of clinical instructors' teaching strategies from the students' perspectives.

Many participants linked their decision making back to a lecture or class, a faculty member's story, or a lab simulation. As they reflected on their decision making, they were able to see how they determined which course of action to take for a patient by recalling previous learning. However, they did not seem to be aware of this thinking process at the time of the decision making and reported becoming aware of it when someone challenged them to reflect on what they considered when making the decision.

Staff nurses who encouraged students and included them in their patient care experiences, helped them learn to make clinical decisions. When staff nurses took an interest in their learning, students gained new experiences and felt more confident to make decisions. This is consistent with findings by Baxter and Rideout (2006); Freundl et al. (2012); and Wiles et al. (2013). Providing constructive feedback to students was essential, while supporting them and recognizing their accomplishments. Lave and Wenger's Situated Learning Theory (1990)-that the setting is important to learning and the social context of the learning and collaboration enhances the experience- supports this process.

Several students focused on the reason they went to nursing school to begin with- to care for patients. They recalled classroom discussions about patient advocacy and patient-centered care. This helped to ground them and also give them courage to speak up on the patient's behalf. The patient-student connection may play a significant role in the way in which a student learns to make clinical decisions and develop into a competent, compassionate nurse (Adamson & Dewar, 2015).

Many students shared reflections on times in which they recognized a change in themselves; most were in the final semester and during their precepted clinical experience. This change was an awareness of growth in knowledge and confidence, worth and value as a member of the healthcare team. Although many could not pinpoint exactly what made this turning point occur, they realized that they were different now and knew more than they ever thought they did. With more clinical experience, students begin to settle in and feel comfortable with at least some of the skills and processes that are repetitive. Completing vital signs, a health assessment, and basic medication administration does not create the angst that it did the first semester they did them. It may be that this turning point they had was an instance when they made an intuitive decision, based on the recognition of many cues and patterns. This is consistent with the findings on the nature of the clinical decisions they make.

Research question 2

The Nature of the Clinical Decisions

All of the participants in this study were in their final semester of nursing school and were responding to the survey which captured a cross-section from which to determine the nature of their clinical decision making. Three quarters of the participants scored in the quasi-rational range of clinical decision making, indicating they are flexible making decisions that are dependent on the situation at hand. Although these findings contradict the work of Benner (1994), who maintained that novice nurses (already graduated) are analytical in their thinking and decision making, there are several possible reasons for this finding. Participants were assessed in the last semester of their program, thus it is possible they had been provided with a series of opportunities during their program to enhance consideration of individual patient circumstances. With each patient experience came the prospect of acquiring cues related to

patient care and/or the health condition. They had opportunities to complete tasks and begin recognizing patterns and cues: all of the constructs Hammond (1988) included in the CCT. Perhaps they were better able to see the cues and recognize patterns and so moved along the continuum towards the intuitive aspect. Could it be that they began moving from ill-structured tasks to more well-structured tasks?

According to Hammond (1981), cues that have an objective, reliable measurement are analytic-inducing while those with a perceptual or sensory nature, are intuitive-inducing. Participants described situations in which patients were upset or emotional about a diagnosis or complication. It was here that they recognized patient cues of fear and worry. They didn't have a clear measure of what to do next, but made decisions to stay with the patient and call the provider. From the cues, they determined their next step. They also did recognize their own fears and worry for the patients and/or family.

Cues within the task are often what drive the decision making and as Hammond described, visual cues are most often directly linked to an intuitive decision. One participant described her lethargic patient and her quick call to action (1-L, p. 76). She didn't know exactly what was going on but recognized the signs of lethargy and "just something about her presentation was off." She recalled what she learned and made the decision to call the team.

One participant shared her story from first semester about a patient who was light-headed and dizzy. The only other similar experience this participant had was prior to nursing school, when a colleague had a low blood sugar. She processed the cue of light-headedness and decided to check a blood sugar. It was not a low blood sugar, but rather low blood pressure. Looking back with the lens of two additional semesters in nursing school, she recalled clammy skin, thready pulse and a position change; all now would lead her to check the blood pressure. She

recognized more cues and would have more readily made a decision to check the blood pressure without added analysis. In this case, the added cues and knowledge led to a more intuitive decision. This is consistent with what Hammond (1981) proposed for intuitive decision making.

Finding one's voice to speak up for the patient and make clinical decisions demonstrated their changing perspective and increasing confidence. This often stemmed from guidance from clinical instructors in which they rehearsed ways to approach and discuss the situation. This cognitive rehearsal (Griffin, 2004) allows students to process information they have previously learned with information they are currently receiving. They were finding more patterns and cues from clinical experiences and even in circumstances that were new, they were often able to rely on past lessons to guide them. This was noted in the quote from JA (group 3, p. 91) in which she had a task to perform- discontinue an IV. This task was systematic and precise requiring analytical processing. However, she began to process this beyond the analytical viewpoint to a more quasi-rational perspective, relating this incident to a patient in the past that had become dehydrated and needed increased fluid intake. It caused her to question the patient's fluid status and decide to more closely assess fluid and electrolyte balance.

The turning point that many students experienced may have actually been when they recognized cues and patterns in particular situations and were able to use their intuitive abilities more than ever before, possibly moving from analytic to quasi-rational decision making. This would explain their inability to clearly articulate what brought them to that point. However, this would be an important aspect of their nursing education; to recognize situations, in which they become more intuitive, can make decisions faster, and may not readily trace back where they learned about it.

Based on Hammond's theory (1981), it is logical that the majority of these senior nursing students are quasi-rational decision makers. Their decision making is flexible and based on the situation at hand. This contradicts with Benner's theory (1994) which proposed they remained at the novice/ analytic stage. The process of growing as a nursing student, through practice and experience requires time and systematic cognitive processing. Students think through the steps of each task they complete. Having clinical experiences that emphasize classroom learning when possible, were important to beginning decision makers, as it reinforced lessons and solidified concepts. Having opportunities to repeat skills and care for similar patients also increases the cues students receive. As they recognize more cues, they are better positioned to make quicker decisions without having to systematically process everything. Because nursing care is dynamic and unpredictable, some situations have very little cues, regardless of the students (or nurse's) experience level. Hammond's CCT makes room for this reality in the quasi-rational mode. The properties of the task lead to the cognition and ultimately, the decision. Regardless of years of experience as a nurse then, decision making is dependent on cognition, the cues recognized, and the task at hand (the familiarity of that task by the nurse).

Cues are dichotomous. Students may not have all the knowledge yet to recognize the cues. There may be many possible solutions to nursing decisions. Analytic decisions can be retraced and justified because they were well thought out and mapped through knowledge and process. Many of the participants shared their concern about making mistakes and focusing on making sure they were following the directions of the clinical instructors. For these reasons, students may refrain from thinking about patient care issues in another way.

Making an analytic decision requires that one is certain of the task at hand. This necessitates understanding the process and purpose behind the task. As a nursing student, that

understanding is dependent on previous clinical experience with that or a similar task and knowledge acquisition related to that task. Even as an experienced nurse, situations arise that are new and different, requiring an analytic approach to decision making. It is logical then, to expect all nurses to utilize various approaches to decision making at different points in their career.

With such a large proportion of participants scoring in the quasi-rational and analytic ranges, it is not surprising that they valued the classroom, lab and clinical learning opportunities. These experiences provided them with structure and a systematic approach to learning about nursing and patient care.

Research Question 3

Relationships between CDM and age, program type, and minority status

Although there were not statistically significant relationships noted between the variables and CDM, results point to interesting and potentially important associations. Older students tended to be more analytical. It could be that they were more thoughtful and reserve; they may be less confident to act without substantial cues to guide their decision making. Students from ABSN programs, having additional education and probably more life experience, also tended to be more analytical, which conflicts the Novice to Expert concept (Benner, 1994, Dreyfus, 1979). It may be that experience and education does lead to intuitive decision making at all. It could be, as mentioned earlier, that intuitive decisions are made based solely on the situation at hand and the presence or absence of cues and patterns.

Limitations

A major limitation of the study relates to sample size. The sample of 155 (completed surveys with demographic data included) provided insufficient power based on a priori sample size determinations. Sampling issues arose in part due to the timing of IRB approval and timing

of data collection. In April and May, with graduation pending, senior nursing students are generally very busy. Several school administrators did not respond to email and phone call correspondence related to study participation.

Gender was inadvertently left off the demographic portion of the survey. This limits findings and comparisons by gender. Given increasing numbers of men enrolling in programs, omission of this information limits the generalizability of findings.

This study only captured a cross-section of the participants' clinical decision making and so did not reflect change over time but rather perspectives at the time of the survey or focus group.

Conclusions

The purpose of this study was to examine the ways in which last semester senior baccalaureate nursing students perceive they learn to make clinical decisions and to determine the nature of the decisions they make. In addition, possible relationships between clinical decision making and the predictor variables (participants' age, baccalaureate program type, previous degree/s, previous healthcare experience, and minority status) were explored. Hammond's Cognitive Continuum Theory (1980, 1981) provided the theoretical framework for the study. The following conclusions were reached during this study:

- Nursing students who participated in this study were primarily quasi-rational in their decision making.
- Decision making is not just based on experience, but is flexible, based on the situation at hand, the cues and patterns recognized, and the time available
- Nursing students in this study used knowledge, people, experiences, and their own growth as a professional to learn to make clinical decisions.
- The clinical instructor is critical to the students' growth in decision making

- Having clinical experiences that strengthened classroom content when possible was important as it reinforced lessons and solidified concepts.
- Having opportunities to repeat skills and care for similar patients also increased students' recognition of the cues they received.

This study paves the way for several areas of future research, all of which may inform and improve nursing education and practice

Implications

This study has implications for education, practice, research and policy. Each will be discussed below.

Education

With better conceptual clarity on critical thinking, clinical reasoning, clinical judgment and clinical decision making nursing educators may be better positioned to help students develop decision making abilities. Understanding how students perceive that they learn to make clinical decisions could alter and potentially improve clinical education. The focus group data provided rich details of the ways students learned to make clinical decisions. Participants shared experiences they had while in school and when faced with a clinical decision to make.

Understanding what actions by the clinical instructor help the students learn to make clinical decisions could change the role of the clinical instructor. Many clinical instructors are hired because they are expert clinicians. They may, however, have no or limited educational expertise (Sorrell & Cangelosi, 2015). Schools of nursing need to plan detailed clinical instructor orientations and continuing education offerings to better prepare these clinical experts for the teaching role. Results from this study have implications for the hiring and preparation of clinical instructors.

The interactions that students have with staff nurses can greatly affect student progress and confidence. Providing more time and interactions between staff nurses and nursing students may greatly enhance students' clinical decision making. Partnering with clinical sites for better cohesiveness between educators and practice partners may help build those bonds.

Planning clinical experiences for students in regards to skills and complex patient care situations may greatly enhance decision making abilities. Creating new models of clinical education that require true partnerships between schools and healthcare agencies may be what is needed to improve students' entry into the workplace and their readiness for practice. Continued work related to the DEU Model (McKown, et al., 2011, Freundl, et al., 2012, & Rhodes, et al. 2012) as well as other models of clinical education is imperative.

Understanding what makes the students experience that turning point has potential to change and improve nursing education, for if educators knew; they could ensure that all students achieve that prior to graduation. It could be the experiences themselves; it could be the confidence they feel over time; it could be the knowledge they attained; or even possibly, it could be the people that believed in them, encouraged them, and trusted in them. It may be beneficial and informative to track students' CDM throughout their programs of study in order to pinpoint when that turning point happens.

If other nursing students are more quasi-rational decision makers, it will be helpful to present them with situations in which they have little time and many cues. This may strengthen their intuitive decision making abilities. However, as Hammond (1981) stated, situations may call for different decision making because of the details connected to it. Utilization of unfolding case studies, team-based learning methods, and other such strategies in the classroom as well as simulation and hands on practice in nursing labs, needs to increasingly challenge students to

make decisions with varying amounts of cues and time. This could help them grow and broaden their decision making abilities.

Curricular development with task, cue and pattern recognition in mind may better prepare students. In addition, structuring learning opportunities like simulation and case studies that involve decision making under pressure and with time variances will allow students to learn to make decisions quickly and more intuitively.

Practice

This study has implications for the practice setting. Understanding how clinical decisions are made while in school can guide new graduate orientation programs, precepted experiences, and continuing education offerings for nurses. Developing nurses to make appropriate clinical decisions will improve patient safety and could improve job satisfaction. Educating staff nurses regarding clinical decision making may be an important addition to annual continuing education offerings. Encouraging nurses to think out loud with each other and with students may help with student growth in decision making. With the rise of technology and the high acuity in hospitals, recognition of tasks and cues necessary to make informed decisions is critical.

Research

Results from this study can inform future research on varying levels of nursing students (i.e. first year BSN, ADN vs BSN) to determine the nature of the decisions they make. Intervention studies aimed at developing clinical instructors and/ or staff nurses in order to increase student experiences with decision making may inform nursing education and practice. Longitudinal studies examining nursing student clinical decision making throughout their program of study and into their practice as a registered nurse may provide important information about the process of building one's decision making abilities.

Policy

Results from this study may bring to light the need for policy change. Funding for nursing education programs, both undergraduate and graduate education may need enhancement in order to fully prepare students for practice. In the same way, additional funding from grants and scholarships could assist in the preparation of nurse educators and clinical instructors. Being an expert clinician does not guarantee one will be an excellent educator. Policy changes may need to be put in place nationwide to ensure that nurse educators are appropriately prepared to provide the guidance and support needed. In North Carolina, for example, the NC Board of Nursing established rules about the preparation and education of anyone who teaches students in pre-licensure nursing programs (NCBON, 2015). They have three years to complete education in teaching and learning principles for adult education, including curriculum development, implementation, and evaluation appropriate to their assignment. They may complete 45 contact hours of continuing education courses, complete a certificate program in nursing education; or complete 9 hours of graduate course work. All states don't have rules such as this, but may need to consider, in order to prepare educators for teaching undergraduate nursing students.

Recommendations for Future Research

Understanding the nature of the clinical decisions undergraduate baccalaureate students make can help nurse educators better prepare them for practice. The students in this study were preparing to graduate, and therefore had limited experience and knowledge. However, it would be important to study nursing students and nurses over time to see when and/or if they change. If it is more about the job at hand, it may continue to vacillate between analysis and intuition. However, if making clinical decisions using a particular approach ensures better decisions or better patient care, it would be beneficial to study ways to enhance that approach.

Longitudinal studies throughout nursing school and among different types of nursing schools (ADN, BSN, and ABSN) and curricula (i.e. concept-based, team-based, and traditional) may inform nursing education as to models that affect clinical decision making.

Following senior nursing students through graduation and licensure and into practice while reassessing the nature of the clinical decisions they make could inform practice as to what aspects of nursing education and new nurse preparation best prepares them for clinical decision making.

Hammond's CCT supported the current study and helped to elucidate the ways in which nursing students make clinical decisions. However, combining Situated Learning Theory (Lave & Wenger, 1990) with the CCT adds a support component that fits well with the nursing environment. Social interaction and collaboration are important components, both in the SLT and in nursing education. Future studies with a theoretical framework of the combined CCT and SLT may further inform nursing education.

Chapter summary

A summary of the study, interpretation of qualitative and quantitative findings as well as triangulated data findings were presented. Limitations of this study were described. Conclusions were described. Implications for education, practice, research and policy were explored. Recommendations for future studies were also discussed.

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Appendix A

Consent from Dr. R. Hamm to use CCT Figure

RE: Clinical Decision Making Model/ Diagram

Hamm, Robert M. (HSC) <Robert-Hamm@ouhsc.edu>
Sat 1/10/2015 1:03 PM
To:

...

You forwarded this message on 1/11/2015 3:38 PM.

Beth, you can use the published diagram. I have not been actively working on it.
I'd be happy to talk with you about your project. I am still interested in Brunswik theory.
Do you know about the dissertations by Mooie Standing, and by Robert C. Holcomb, 2011, George
Mason University? As well as Dunwoody's work, which Holcomb reviews.

Rob Hamm

From: Beth Cusatis Phillips [mailto:phill256@uwm.edu]
Sent: Saturday, January 10, 2015 9:46 AM
To: Hamm, Robert M. (HSC)
Subject: Clinical Decision Making Model/ Diagram

Dear Dr. Hamm,

I am a PhD student at the University of Wisconsin- Milwaukee. My dissertation is on Clinical Decision Making in Nursing Students. I have been reading your work and am particularly interested in the Cognitive Continuum Theory and the diagram you adapted from Hammond's work. Is there an updated diagram since 1988? May I have permission from you to use this in my dissertation?

I appreciate your time and consideration.

Beth Phillips
phill256@uwm.edu

Appendix B
Email Permission to use Table 1

University Science Books <univscibks@igc.org>
Reply all |

Thu 10/8/2015 3:53 PM

To: phill256@uwm.edu

Thu 10/8/2015 3:53 PM

Dear Beth,

I am sure my father, Dr. Kenneth Hammond, would welcome the use of his material in your dissertation! So I hereby give you permission!

Best regards,

Kathy Armbruster

-----Original Message-----

From: Beth Phillips

Sent: Oct 8, 2015 6:50 PM

To: "univscibks@igc.org"

Cc: Beth Cusatis Phillips

Subject: Fw: Kenneth Hammond's work

Dear Ms. Armbruster,

I got your email address from Donna Caccamise in relation to gaining permission to use the attached table from your father's work in my dissertation. I have followed and read much of your father's work over the last 5 years and was saddened to hear of his passing.

His Cognitive Continuum Theory is so appropriate for the nursing community and is the theory I used for the foundation of my study. Can you give me permission to include or do I need to go to the publisher? Thank you for your consideration.

Beth Cusatis Phillips, MSN, RN, CNE

Assistant Professor

Duke University School of Nursing

Doctoral Candidate, University of Wisconsin-Milwaukee

Appendix C

NURSING DECISION-MAKING INSTRUMENT-Revised 2014

Sirkka Lauri and Sanna Salanterä 2002

Listed below are some statements that describe how nurses make decisions in different situations of patients' care. Please read each statement carefully and mark the square that best describes your own action.

	Never or almost never (1)	Rarely (2)	Not rarely or not often (3)	Often (4)	Almost always or always (5)
1. I collect as much information from the patient's records prior to beginning care.					
2. I rely on my own interpretations when it comes to defining the patient's condition.					
3. I specify all the items I intend to monitor and ask the patient about based on the information I collect before beginning care.					
4. I make assumptions about potential nursing problems during the first contact with the patient.					
5. I confirm the impression I have formed from information collected by searching for symptoms that support my views.					
6. It is easy for me to make a distinction between relevant and irrelevant information in defining the patient's condition.					
7. I compare information I have received about the patient with my earlier knowledge of similar individual patients' cases.					
8. I compare information I have received about the patient with my own experiences in nursing practice.					
9. I compare information I have received about the patient with research knowledge about the nursing care and its impacts.					
10. It is easy for me to see, even without closer analysis, which pieces of information are relevant to defining the patient's nursing problems.					
11. I define the patient's nursing problems objectively on the basis of the symptoms and complaints observed.					

	Never or almost never	Rarely	Not rarely or not often	Often	Almost always or always
12. It is easy for me to form an overall picture of the patient's situation and major nursing problems.					
13. I devise the patient's nursing plan according to the stages of the nursing decision-making process.					
14. I base the patient's nursing plan on my own nursing views and/or the patient's views on his/her care.					
15. I base the patient's nursing plan on the general regimes prescribed for the patient's disease.					
16. I document without difficulties the general directions concerning the patient's care to the patient's records.					
17. I set target goals for the patient's care that are easy to measure.					
18. I anticipate the impacts of nursing interventions on the patient.					
19. I follow as closely as possible the patient's existing nursing plan for his/her disease and situation.					
20. I anticipate changes in the patient's condition on the basis of individual cues even before there are any clear symptoms.					
21. I use specific information about the treatment of the patient's disease when making decisions about nursing care.					
22. I flexibly change my line of action on the basis of feedback on the patient's situation.					
23. I try to find reasons for my own observations of changes in the patient's condition.					
24. It is easy for me to assess the impacts of my actions on the patient's condition.					

THANK YOU! 😊

Appendix D

Demographic Questionnaire

1. Are you already a registered nurse? Yes_____ No _____

2. What is your age? _____

3. Select your race:

_____Caucasian

_____Black or African American

_____Hispanic or Latino

_____Asian

_____Native Hawaiian or other Pacific Islander

_____American Indian, Alaska Native

_____Other (specify)_____

4. Select your highest level of education after high school:

_____Associate degree

_____Bachelor's degree

_____Master's degree

_____PhD or other doctoral degree

5. Do you have any healthcare-related work experience?

_____yes

_____no

If yes, what was your title and job? _____

6. What type of nursing program are you currently enrolled in?

_____Accelerated BSN _____Traditional BSN

Appendix E

Invitation to participate to school deans

From: Beth Cusatis Phillips
Sent: Wednesday, April 8, 2015 11:16 PM
To:
Subject: Clinical Decision Making Study

Dear Dean,

I am a PhD student at the University of Wisconsin-Milwaukee and live in North Carolina. I am writing today to solicit your school's participation in a research study on **Clinical Decision-Making in Last Semester Senior Baccalaureate Nursing Students.**

Your school was randomly chosen out of the 20 BSN Programs in North Carolina to be invited to participate along with 9 other programs. Approximately 300 subjects will participate in the online survey component of this study and approximately 30 subjects will participate in one 90 minute focus group at their school in North Carolina. This study is being conducted by Beth Cusatis Phillips, a University of Wisconsin-Milwaukee PhD candidate.

The purpose of this mixed methods study is to examine the ways in which senior baccalaureate nursing students in their final semester learn to make clinical decisions and to determine the nature of the decisions they make.

If you agree to allow your students to participate, they will be asked to complete two things:

1. A short demographic instrument via REDCap
2. A 24 item survey instrument called the Nurse Decision Making Instrument-Revised 2014- again via REDCap

At the end of the survey, students will be asked to participate in a focus group on your campus at a time and date convenient for them. If they choose to participate, they will provide me with further contact information in order to arrange the focus groups. I will need to secure a room on your campus to hold the focus group/s.

There are minimal risks to this study. This study is completely independent from your nursing program. Your nursing program will not have information on who did or did not participate in this study. There are no costs for participating. Benefits of participating in this study include the potential for a better understanding in the ways nursing students learn to make clinical decisions. All students completing the online survey will have the opportunity to win one of 10 \$25.00 gift cards. Focus group participants will also be able to enter a drawing for a \$25.00 gift card.

All information collected for this study is completely confidential and no individual participant will ever be identified with his/her research information. Data from this study will be saved on

password protected computer or in a locked file drawer, until investigator has completed requirements for PhD and all publications associated with this study are complete (anticipate 2016). Only principle investigator, Beth Phillips, and major professor, Dr. Karen Morin, will have access to the research information. However, the institutional Review Board at UW-Milwaukee or appropriate federal agencies like the Office for Human Research Protections may review this study's records.

If you have questions about the study or study procedures, you are free to contact the investigator at the address and phone number below. If you have questions about your rights as a study participant or complaints about your treatment as a research subject, contact the Institutional Review Board at (414)229-3173 or irbinfo@uwm.edu

I thank you for considering the opportunity for your school to participate in this study! The attached letter contains the student consent and information as well as the link to the survey. Attached is the IRB approval from UWM.

Sincerely,

Beth C. Phillips

Beth Cusatis Phillips, MSN, RN, CNE
UW-Milwaukee PhD candidate
3315 Woodland Park Road
Durham, NC 27703
919-949-9110 (mobile)
phill256@uwm.edu

Appendix F

IRB Approval-UWM



Department of University Safety & Assurances

Jessica Rice
IRB Administrator
Institutional Review Board
Engelmann 270
P. O. Box 413
Milwaukee, WI 53201-0413
(414) 229-3182 phone
(414) 229-6729 fax

<http://www.irb.uwm.edu>
ricej@uwm.edu

Modification/Amendment Notice of IRB Exempt Status

Date: April 28, 2015

To: Karen Morin, PhD
Dept: College of Nursing

Cc: Beth Phillips

IRB#: 15.240

Title: Clinical Decision Making in Last Semester Senior Baccalaureate Nursing Students

After review of your proposed changes to the research protocol by the University of Wisconsin – Milwaukee Institutional Review Board, your protocol still meets the criteria for Exempt Status under **Category 2** as governed by 45 CFR 46.101 subpart b, and your protocol has received modification/amendment approval for:

- Expand study to include recruitment from schools outside of North Carolina
- Revisions to consent form and survey instrument to reflect this

Unless specifically where the change is necessary to eliminate apparent immediate hazards to the subjects, any proposed changes to the protocol must be reviewed by the Institutional Review Board before implementation.

Please note that it is the principal investigator's responsibility to adhere to the policies and guidelines set forth by the University of Wisconsin – Milwaukee and its Institutional Review Board. It is the principal investigator's responsibility to maintain proper documentation of its records and promptly report to the Institutional Review Board any adverse events which require reporting. The principal investigator is also responsible for ensuring that all study staff receive appropriate training in the ethical guidelines of conducting human subjects research.

Contact the IRB office if you have any further questions. Thank you for your cooperation and best wishes for a successful project.

Respectfully,

A handwritten signature in cursive script, appearing to read "Jessica Rice".

Jessica Rice
IRB Administrator

Appendix G

IRB Approval-Duke



IRB NOTIFICATION OF AMENDMENT APPROVAL

Amendment ID: Amd001_Pro00061210
Principal Investigator: Beth Phillips
Protocol Title: Clinical Decision Making in Last Semester Senior Baccalaureate Nursing Students
Sponsor/Funding Source(s): There are no items to display
Federal Funding Agency ID:
Date of Declared Concordance with federally funded grant, if applicable: N/A

The Duke University Health System Institutional Review Board for Clinical Investigations has conducted the following activity on the study cited above:

Activity: Amendment **Review Type:** Expedited
Review Date: 4/8/2015
Issue Date: 4/8/2015
Expiration Date: 2/18/2018

DUHS IRB approval encompasses the following specific components of the study:

Protocol, version/date: --
Summary, version/date: --4/1/2015
Consent form reference date: --
Investigator Brochure, version/date: --
Pediatric Risk Category: --
Other: --Full Consent Letter to Dean, Student Recruitment Letter, Clinical Decision Making, IRB Manager_Protocol_Form Phillips Pilot, UWM IRB Approval Notice

Appendix H
IRB Letter of approval from out of state school

May 28, 2015

Beth C. Phillips
Duke University
School of Nursing

Dear Ms. Phillips:

You have requested permission to use [REDACTED] as a research site for your study entitled, "Clinical Decision Making in Last Semester Senior Baccalaureate Nursing Students."

You have provided the IRB at [REDACTED] with evidence of IRB approval from your home institution, as well as a copy of relevant materials from your approved human subjects' protocol.

Therefore, I am granting you access to use [REDACTED] as a research site, provided that you comply with the IRB materials that you have submitted to me. Please notify the IRB at [REDACTED] immediately should any changes to these materials occur.

[REDACTED] Provost and Vice President for Academic Affairs, has approved your request for access to the nursing student population.

Best wishes on your research.

Sincerely,

Appendix I

Student Invitation and Consent

Dear Nursing Student,

You are invited to participate in a research study entitled, *Clinical Decision Making in Last Semester Senior Baccalaureate Nursing Students*. This study is being conducted by Beth Phillips a University of Wisconsin-Milwaukee PhD candidate.

The purpose of this mixed methods study is to examine the ways in which senior baccalaureate nursing students in their final semester learn to make clinical decisions and to determine the nature of the decisions they make.

If you agree to participate, a link to the surveys will be sent to you via email from a school administrator.

You will be asked to complete two things:

1. A short demographic instrument via REDCap
2. A 24 item survey instrument called the Nurse Decision Making Instrument-Revised 2014- again via REDCap

Approximately 300 nursing students from around the state are participating. The anticipated time investment is 30 minutes for the online survey. At the end of the survey, you will be asked to participate in a Focus Group on your campus at a time and date convenient for you and your peers. The Focus Groups will take approximately 90 minutes. If you choose to participate, you will need to provide me with further contact information in order to arrange the focus groups.

There are minimal risks to this study. This study is completely independent from your nursing program. Your nursing program will not have information on who did or did not participate in this study. There are no costs for participating. Benefits of participating in this study include the potential for a better understanding in the ways nursing students learn to make clinical decisions. All students completing the online survey will have the opportunity to win one of 10 \$25.00 gift cards. In addition, Focus group participants will also have the opportunity to win a \$25.00 gift card (one per group) and will be provided refreshments in exchange for their participation.

All information collected for this study is completely confidential and no individual participant will ever be identified with his/her research information. Data from this study will be saved on password protected computer or in a locked file drawer, until investigator has completed requirements for PhD and all publications associated with this study are complete (anticipate 2016). Only principle investigator, Beth Phillips, the major professor, Dr. Karen Morin, Susan Silva, a statistician, and Christa Caruso, a transcriptionist, will have access to the research information. However, the institutional Review Board at UW-Milwaukee or appropriate federal agencies like the Office for Human Research Protections may review this study's records.

If you have questions about the study or study procedures, you are free to contact the investigator at the address and phone number below. If you have questions about your rights as a study participant or complaints about your treatment as a research subject, contact the Institutional Review Board at (414)229-3173 or irbinfo@uwm.edu

I thank you for considering the opportunity to participate in this study!

Beth Cusatis Phillips, MSN, RN, CNE
UW-Milwaukee PhD candidate
3315 Woodland Park Road
Durham, NC 27703
919-949-9110 (mobile)
phill256@uwm.edu

University of Wisconsin

Study Title: Clinical Decision Making in Last Semester Senior Baccalaureate Nursing Students

Person Responsible for Research: Dr. Karen Morin, PhD, RN, ANEF, FAAN School of Nursing
Beth Cusatis Phillips, MSN, RN, CNE

Study Description: The purpose of this mixed methods study is to examine the ways in which baccalaureate senior nursing students learn to make clinical decisions and to determine the nature of the decisions they make. Approximately 30 subjects will participate in one 90 minute focus group at their school. The purpose of this discussion is to learn about the clinical decisions you have made while in school. The researcher is interested to know about the decisions you have made, and how you learned to make them.

Risks / Benefits: Risks that you may experience from participating are considered minimal. There are no costs for participating. There are no benefits to you other than to further research. Completion of the focus group will give you an opportunity to enter a drawing for a \$25.00 gift card.

Confidentiality: Identifying information such as your name and email address will be collected in order to participate in the drawings and focus groups only. Your focus group responses will be treated as confidential and all reasonable efforts will be made so that no individual participant will be identified with his/her answers. The focus group sessions will be recorded and transcribed. The research team will remove your identifying information from data after completion and transcription of audio recording and all study results will be reported without identifying information so that no one viewing the results will ever be able to match you with your responses. Data from this study will be saved on a password-protected computer in a locked room for up to three years. Only the PI, study staff, and transcriptionist will have access to your information. However, the Institutional Review Board at UW-Milwaukee or appropriate federal agencies like the Office for Human Research Protections may review this study's records.

Voluntary Participation: Your participation in this study is voluntary. You may choose not to take part in this study, or if you decide to take part, you can change your mind later and withdraw from the study. You are free to not answer any questions or withdraw at any time. Your decision will not change any present or future relationships with the University of Wisconsin Milwaukee.

Who do I contact for questions about the study: For more information about the study or study procedures, contact Beth Phillips at phill256@uwm.edu or 919-949-9110.

Who do I contact for questions about my rights or complaints towards my treatment as a research subject? Contact the UWM IRB at 414-229-3173 or irbinfo@uwm.edu.

Research Subject's Consent to Participate in Research:

To voluntarily agree to take part in this study, you must be 18 years of age or older. By signing the consent form, you are giving your consent to voluntarily participate in this research project.

Printed Name of Subject/Legally Authorized Representative

Signature of Subject/Legally Authorized Representative

Date

Appendix J

Letter of agreement

This is a letter of agreement between Sanna Salanterä and Beth Cusatis Phillips about the use of the *Nurse Decision-Making Instrument* by Sirkka Lauri and Sanna Salanterä 2002.

By signing this letter of agreement Sanna Salanterä gives permission to

Beth Cusatis Phillips to use the *Nurse Decision-Making Instrument* for research purposes. All modifications or rephrasings have to be approved by Sanna Salanterä

To obtain permission to use the *Nurse Decision-Making Instrument* Beth Cusatis Phillips commits to clearly identify the *Nurse Decision-Making Instrument's* source in the text and in the reference list of any document naming the *Nurse Decision-Making Instrument* as follows: *Nurse Decision-Making Instrument* by Sirkka Lauri and Sanna Salanterä 2002.

By signing this letter of agreement Beth Cusatis Phillips also commits to share results from her research with Sanna Salanterä and Sirkka Lauri (via Salanterä).

This agreement should not be deemed as a copyright transfer.

On behalf of Sirkka Lauri and Sanna Salanterä

Date

Beth Cusatis Phillips

Sanna Salanterä
PhD, RN
Professor of Clinical Nursing Science
Department of Nursing Science
20014 University of Turku
Finland

Beth Cusatis Phillips, MSN, RN, CNE
Doctoral Student
University of Wisconsin-Milwaukee
School of Nursing
3315 Woodland Park Road
Durham, NC 27703 USA

Appendix K

Email confirmation of approval for using amended instrument

Sanna Salanterä <sansala@utu.fi>
Sun 9/28/2014 12:53 PM

To:
Beth Cusatis Phillips;
You replied on 10/1/2014 8:01 PM.

Dear Beth, good work. Thanks for making the english more fluent. I read through your suggested changes and I think they are all right except for the 13. where you can choose from devise or create. I think either one is good. Perhaps devise is more neutral and I suggest that.

Since we now change the wording (you are the first one who has suggested this), I suggest we call it the Nursing Decision Making Instrument -revised 2014. This way it is not mixed with the previous one, which is quite widely used already. I will also take this new one into use after this.

sanna

Professor of Clinical Nursing Science
Vice Head of the Department
Department of Nursing Science
20014 University of Turku
Finland
+35823338414

Tiedettä, tutkimusta ja Mahdollisuuksia uralle, TtM!
HAE OPISKELEMAAN HOITOTIEDETTÄ TURKUUN!
Hakuaika 3.3.-1.4.2014
www.yliopistohaku.fi
Lisätietoa: www.utu.fi/hoitotiede

Appendix L

NDMI-14 for CVT testing

NURSING DECISION-MAKING INSTRUMENT-Revised 2014

Sirkka Lauri and Sanna Salanterä 2002

Please read each item below and evaluate both the individual items and the entire instrument on the following questions:

Is the item relevant and appropriate in terms of clinical decision making in nursing?

Does the instrument adequately measure all dimensions of clinical decision making in nursing?

Items 1-6 pertain to Data Collection

Items 7-12 pertain to data processing and identification of the problem

Items 12-18 pertain to the plan of action

Items 19-24 pertain to Implementation, monitoring, and evaluation

	1 Not relevant	2 Somewhat relevant	3 Quite relevant	4 Very relevant
1. I collect as much information from the patient's records prior to beginning care.				
2. I rely on my own interpretations when it comes to defining the patient's condition.				
3. I specify all the items I intend to monitor and ask the patient about based on the information I collect before beginning care.				
4. I make assumptions about potential nursing problems during the first contact with the patient.				
5. I confirm the impression I have formed from information collected by searching for symptoms that support my views.				
6. It is easy for me to make a distinction between relevant and irrelevant information in defining the patient's condition.				
7. I compare information I have received about the patient with my earlier knowledge of similar individual patients' cases.				
8. I compare information I have received about the patient with my own experiences in nursing practice.				
9. I compare information I have received about the patient with research knowledge about the nursing care and its impacts.				
10. It is easy for me to see, even without closer analysis, which pieces of information are				

relevant to defining the patient's nursing problems.				
11. I define the patient's nursing problems objectively on the basis of the symptoms and complaints observed.				
12. It is easy for me to form an overall picture of the patient's situation and major nursing problems.				
13. I devise the patient's nursing plan according to the stages of the nursing decision-making process.				
14. I base the patient's nursing plan on my own nursing views and/or the patient's views on his/her care.				
15. I base the patient's nursing plan on the general regimes prescribed for the patient's disease.				
16. I document without difficulties the general directions concerning the patient's care to the patient's records.				
17. I set target goals for the patient's care that are easy to measure.				
18. I anticipate the impacts of nursing interventions on the patient.				
19. I follow as closely as possible the patient's existing nursing plan for his/her disease and situation.				
20. I anticipate changes in the patient's condition on the basis of individual cues even before there are any clear symptoms.				
21. I use specific information about the treatment of the patient's disease when making decisions about nursing care.				
22. I flexibly change my line of action on the basis of feedback on the patient's situation.				
23. I try to find reasons for my own observations of changes in the patient's condition.				
24. It is easy for me to assess the impacts of my actions on the patient's condition.				

Appendix M

Focus Group Interview Guide

Adapted from Krueger, 2002

Research question 1

How do last semester senior baccalaureate nursing students perceive they learn to make clinical decisions?

Agenda

Opening Script: Welcome to this focus group and thank you for agreeing to participate. My name is Beth Phillips. I am a PhD student at the University of Wisconsin-Milwaukee. I am doing my dissertation on clinical decision making and senior baccalaureate nursing students. The purpose of this discussion is for me to learn about the clinical decisions you have made while in school. I am interested to know about the decisions you have made, and how you learned to make them. I will begin by asking you to consider a time when you made a clinical decision and then share that with us. I would like for everyone to share. First, I would like everyone to introduce themselves.

Consents reviewed and signed

Ground rules

There are no right or wrong answers.

Everyone's opinion matters

One person talks at a time.

Cell phones are silenced or turned off.

Conversation is being recorded and transcribed. No linking identifiers

Opening Questions

"Think about a clinical situation you have had during school in which you made related to patient care."

"Your situation could have taken place at any time during your nursing program."

"Who would like to start by sharing his or her ideas?"

"What thoughts went through your head while you were making the decision?"

“What happened after the decision was made?”

“Tell me how you came to the decision.”

“What or who helped you make this decision?”

“What did that person do that was helpful?”

“Are there other things about that patient experience that you want to share?”

Questions to move the discussion forward/ delve deeper

“Tell me more?”

“How did you know to do that?”

Role of the moderator

Make the atmosphere relaxed and conducive to conversation and sharing.

Maintain all ground rules

Explain role of observer and gain permission for presence

Create a diagram of the room to identify and connect voices and words

Facilitate the group conversation to address the research question

Do not contribute to the discussion

Clarify, paraphrase and reflect back

Role of the assistant/observer

Assist with recording, set up and take down

Welcome participants

Sit outside of the group but in a location that everyone is visible

Take notes about the discussion, the people, non-verbal communication, facial expressions, etc.

Do not participate in the discussion

Debrief with moderator

Provide written feedback on observation perspective

Appendix N

Email Exchange example to out of state school deans

From: Beth Phillips
Sent: Friday, May 22, 2015 7:43 AM
To: Dr. M
Subject: RE: BSN dissertation study

Good morning Dr. M. That would be great! Here is the link as well as an information letter for the students. Thank you so much!

<https://redcap.dtm.duke.edu/redcap/surveys/?s=WbtSdUhZVJ>

Beth

From: Dr. M
Sent: Thursday, May 21, 2015 12:14 PM
To: Beth Phillips
Subject: Re: BSN dissertation study

Great- surveying students is fine. Do u want me to send out a link?

On May 21, 2015, at 8:13 AM, Beth Phillips <beth.phillips@duke.edu> wrote:
Good morning Dr. M,

I wanted to follow up with you in regards to doing my dissertation study with your senior class. I would be glad to answer any questions you or the Dean may have. Ideally, I would like to survey the students soon so that if enough want to participate in the focus group, I can arrange my travel and find a time that works well before their graduation. Thanks again!

Beth Phillips

From: Beth Phillips
Sent: Thursday, May 07, 2015 9:17 AM
To: Dr. M
Subject: RE: BSN dissertation study

That is terrific! Thank you so much! Part I is the survey via RedCap (Attached). I will amend to add your school to the list and graduation as summer, 2015 if it is approved. Part II is a focus group. At the end of the survey, participants are asked if they are interested in participating. If any of your students are, I would love to come up and hold a focus group at JHU.

I look forward to hearing from you and thank you for the help!

Beth
Phill256@uwm.edu
Beth.phillips@duke.edu

From: Dr. M
Sent: Thursday, May 07, 2015 9:06 AM
To: Beth Phillips
Subject: Re: BSN dissertation study

Yes, a BSN. Can you send me a copy of the IRB approval as survey? I will send to Associate Dean for approval.

On May 7, 2015, at 8:54 AM, Beth Phillips <beth.phillips@duke.edu> wrote:
Good morning. Do the accelerated students finishing in July end up with a BSN or MSN? If it is a BSN, that works perfectly!
Beth

From: Dr. M
Sent: Thursday, May 07, 2015 8:21 AM
To: Beth Cusatis Phillips
Cc: Beth Phillips
Subject: Re: BSN dissertation study

Hi Beth,
We actually don't have any senior students at all. We have only accelerated programs. One group graduates in July and one in December. Does that work for you?

Dr. M

On May 6, 2015, at 11:20 PM, Beth Cusatis Phillips <phill256@uwm.edu> wrote:

Dear Dr. M.,

My name is Beth Phillips. I am a PhD student at the University of Wisconsin-Milwaukee. I am studying Clinical Decision Making in Last Semester Senior Baccalaureate Nursing Students. My mixed methods study includes an online survey. I am writing to inquire if you have a cohort of seniors who will graduate in August. If so, is it possible for them to participate in my study? I have IRB approval both from UWM and from Duke (my employer).

Thank you for your consideration. If you have such a class, I will gladly forward the link to my survey as well as my IRB approval.

Sincerely,

Beth Phillips

Curriculum Vitae

Beth Cusatis Phillips

Place of birth: Waukesha, Wisconsin

Education:

A.D.N., Waukesha County Technical Institute, May 1983

Major: Nursing

B.S.N., East Carolina University, May 1989

Major: Nursing

M.S.N., Duke University School of Nursing, May 1993

Major: Nursing

PhD: University of Wisconsin-Milwaukee, December, 2015

Focus: Nursing

Teaching Experience

Duke University School of Nursing (* course coordination)

<u>Course Number</u>	<u>Course Name</u>	<u>Dates: Semester/Year</u>
N202	Foundations for Evidence Based Nursing Practice	Fall, 2005
N233	Nursing Specialty Synthesis	Fall, 2005
N211	Adult Health Nursing*	Spring, 2006
N202	Foundations for Evidence Based Nursing Practice*	Fall, 2006, 2007
N233	Nursing Specialty Synthesis	Fall, 2006, 2007
N211	Adult Health Nursing*	Spring, 2007, 2008, 2009
N211	Adult Health Nursing*	Summer, 2010, 2011 Summer, 2012, 2014 Spring, 2013

N203 (course changed)	Foundations of Evidence Based Nursing Practice and Health Assessment*	Fall, 2008, 2009, 2010, 2011; Spring, 2010, 2011 Fall, 2012, Spring, 2013
N232	Senior Seminar	Fall, 2014
N390	Health Assessment and Nursing Skills Across the Lifespan	Fall, 2014, Spring, 2015
N474	Nursing Management of the Adult Patient	Summer, 2015

Publications:

1. Refereed journals:

1. Utley-Smith, Q., **Phillips, B.**, & Turner, K. (2007). Avoiding socialization pitfalls in accelerated nursing education: Re-visiting Shane's returning to school model. *Journal of Nursing Education*, 46(9), 423-426. PMID: [17912995](#)
2. **Phillips, B.** (2007). An education-service collaboration to address a perceived graduate RN readiness gap. *Nursing Outlook*, 55(2), 112-113. PMID: [17386316](#)
3. Turner, K. M., Chudgar, S. M., Engle, D., Molloy, M. A., **Phillips, B. C.**, Stevenson, E. L., & Clay, A. S. (2013). "It takes a village": An interprofessional patient safety experience for nursing and medical students. *Medical Science Educator*, 23(3s), 449-556. URL: <http://link.springer.com/article/10.1007/BF03341667#page-1>
4. Pereira, K., **Phillips, B.**, Johnson, C., & Vorderstrasse, A. (2014). Internet delivered diabetes self-management education: A review. *Diabetes Technology & Therapeutics*, Epub ahead of print 9/19/2014. doi:10.1089/dia.2014.0155. PMID: [25238257](#) URL: <http://online.liebertpub.com/doi/full/10.1089/dia.2014.015>

2. Non-refereed publications:

Published

1. **Cusatis-Phillips, B.** (1995). Patient focused care. *The Critical Care Monitor*, 4(4), 4. UNC Hospitals Bi-monthly Critical Care newsletter.
2. **Phillips, B.** (2001). *Coping strategies in bridging the gap between education and practice: Train the trainer manual*. Raleigh, NC: Wake Area Health Education Consortium, Raleigh, NC.
3. **Phillips, B.** (2000). *Coping strategies in bridging the gap between education and practice*. Raleigh, NC: Wake Area Health Education Consortium.

4. **Phillips, B.** (2008). Celebrate nurses now! Triangle Nurse Appreciation Council unifies profession. *Advance for NURSES*, 19(19), 9.
5. **Phillips, B.**, Shaw, R. J., Sullivan, D. T., & Johnson, C. (2010). Using virtual environments to enhance nursing distance education. *Creative Nursing*, 16(3), 132-135. PMID: [20879622](https://pubmed.ncbi.nlm.nih.gov/20879622/)

3. Book Chapters:

Published

1. **Cusatis Phillips, B.**, & Blust, K. (2009). Student perspectives on clinical learning, in N. Ard & T. Valiga, (Eds.), *Clinical Nursing Education: Current Reflections* (pp. 103-116). New York: National League for Nursing.
2. Valiga, T.M., Gordon, H., & **Phillips, B. C.** (2014). Promoting and assessing critical thinking (Chapter 10). In DeYoung, S., *Teaching strategies for nurse educators* (3rd ed.), Boston, MA: Pearson.
3. Valiga, T.M. & **Phillips, B. C.** (2014). The teaching experience in nursing. In Cannon, S. & Boswell, C. (Eds.), *Evidence-based teaching in nursing: A foundation for educators*, (3rd Ed.). Sudbury, MA: Jones & Bartlett.

4. Non-authored publications:

1. Rogalski, J. (2011, Winter). Connected: As technology transforms the classroom, person-to-person connections remain vital. *Duke Nursing Magazine* 6(1), 18-23. [Article features innovations in educational technology by School of Nursing faculty and staff, including comments on Virtual Nursing Lab by **Phillips** in ABSN program.] URL: https://nursing.duke.edu/sites/default/files/alumni/magazine/134368_cai_nursing1.pdf
2. Business Wire. (2012, June 6). Nursing programs see real life results from real life clinical reasoning scenarios. Posted to *Medicine Forum Network* (<http://www.medicineforum.net/nursing-programs-see-real-life-results-from-real-life-clinical-reasoning-scenarios>) [Article about ATI Real Life Clinical Reasoning Scenarios in nursing education includes comments by **Phillips**.]
3. Ryan, K. (2014, October 6). Is internet-based diabetes self-management education beneficial? [Highlights the review published in 2014 by Pereira, **Phillips**, Johnson, and Vorderstrasse in *Diabetes Technology & Therapeutics*, with comments by journal editor.] Posted to:
 - *Latinos Health*. URL: <http://www.latinoshealth.com/articles/3487/20141006/is-internet-based-diabetes-self-management-education-beneficial.htm> (10/6/2014)
 - *Genetherapy.me*. URL: <http://www.genetherapy.me/tag/diabetes-self> (10/7/2014)
 - *Healthcanal*. URL: <http://www.healthcanal.com/metabolic-problems/diabetes/55972-is-internet-based-diabetes-self-management-education-beneficial.html>

4. Tan, A. (2014, October 7). E-learning more effective to teach diabetes patients self-management. *Diabetes News Journal* (<http://diabetesnewsjournal.com/2014/10/07/e-learning-more-effective-to-teach-diabetes-patients-self-management/>) [This post also highlights the review published in 2014 by Pereira, **Phillips**, Johnson, and Vorderstrasse in *Diabetes Technology & Therapeutics*].

5. Other:

a. Selected Abstracts

1. **Phillips, B.** (2009). Preparing clinical instructors: A regional response. Presented at NLN Annual Education Summit, Philadelphia, PA. September, 2009.
2. **Phillips, B.** & Johnson, C. (2010). Lab experiences without the lab: The design and use of a virtual 3D Environment for learning patient care. NLN Annual Education Summit, Las Vegas, NV. October, 2010. URL: <http://www.nursinglibrary.org/vhl/handle/10755/164560>
3. **Phillips, B. C.,** & Valiga, T. (2014). It's time to STOP settling for mediocrity in nursing education and start expecting EXCELLENCE. Presented at 2014 Nurse Educator's Conference in the Rockies [Centennial AHEC], Breckenridge, CO, July 18, 2014. Abstract at URL: <http://nec2014.sched.org/event/8af8e80e2da2a5134e4ad43bca3f5c7c#.VEGaF02BGUk>

Presentations: National, Regional, and State (* indicates CEU)

<u>Presentations: National, Regional, & State</u>	<u>CEU</u>	<u>Date</u>
Phillips, B. Collaboration between nurses and doctors. Poster presented at the 2010 ATI National Nurse Educator Summit, Las Vegas, NV.	*	April, 2010
Phillips, B. & Johnson, C. Utilizing the immersive web in nursing education. Presented at the 2010 Technology Integration Program for Nursing Education and Practice (TIP-NEP) Conference, Durham, NC		August, 2010
Phillips, B., Johnson, C.M. Lab Experiences without the Lab: The Design and Use of a Virtual 3D Environment for Learning Patient Care. Presented at the NLN Education Summit 2010, Las Vegas, Nevada.	*	October, 2010
Phillips, B., Markowitz, M., & Sims, B. Demystifying the grant writing process. Presented at the ATI National Nurse Educator Summit, Orlando, FL. April, 2011.	*	April, 2011
Phillips, B. & Johnson, C. Incorporating technology using a virtual environment. Presented at the ATI National Nurse Educator Summit, Orlando, FL. April, 2011.	*	April, 2011

<u>Presentations: National, Regional, & State</u>	<u>CEU</u>	<u>Date</u>
Day, L., Gordon, H., Phillips, B. , Vorderstrasse, A., Wood, K. Enhancing the visibility and value of pedagogical expertise in a research-intensive environment. Paper presented at the Drexel University Nursing Education Institute, Atlantic City, NJ.	*	June, 2011
Phillips, B. , Johnson, C. Duke University's Virtual Environments in Nursing Education. Presented at The 6th NLN Technology Conference: The HIT Parade, Durham, NC.	*	November, 2011
Phillips, B. & Volk Hartel, N. Success in the faculty role. Presented at the 2012 ATI National Nurse Educator's Summit, Scottsdale, AZ.	*	April, 2012
Phillips, B. & Volk Hartel, N. Maintaining success in the faculty role. Presented at the 4 th Annual Pursuing Radical Transformation in Nursing Education Conference, Durham, NC.	*	November, 2012
Phillips, B. Exploring new horizons in education: New clinical education models. Presented at Pursuing Radical Transformation in Nursing Education Conference, Durham, NC.	*	November, 2012
Phillips, B. Nursing faculty: Learning from our mistakes. Presented at the 2013 ATI National Nurse Educator Summit, Las Vegas, NV.	*	April, 2013
Gordon, G. & Phillips, B. Involving students in course design & management. Presented at 2013 Pursuing Radical Transformation in Nursing Education Conference, Durham, NC.	*	November, 2013
Oermann, M. (moderator); Valiga, T., Phillips, B. , & Gordon, H (panelists). Facing the challenges of transforming nursing education – open dialogue. Panel presentation, 2013 Pursuing Radical Transformation in Nursing Education Conference Durham, NC.	*	November, 2013
Sabol, V. K., Molloy, M., Phillips, B. C. , & Silva, S. (2014). Measuring entry-level providers' self-efficacy, attitudes and knowledge related to the care of bariatric patients. Poster, 2nd Annual US-Sino Forum: Advancing Nursing Research and Education Across the Globe, Durham, NC.		March, 2014
Phillips, B. Good faculty ... bad feedback. Podium Presentation, 2014 ATI National Nurse Educator Summit, Orlando, FL.	*	April, 2014

<u>Presentations: National, Regional, & State</u>	<u>CEU</u>	<u>Date</u>
Sabol, V. K., Molloy, M., Phillips, B. C. , & Silva, S. (2014). Measuring entry-level providers' self-efficacy, attitudes and knowledge related to the care of bariatric patients. Poster, Interdisciplinary Research on Long-term Care and Healthy Aging Conference, Durham, NC.		April, 2014
Valiga, T. & Phillips, B. (2014). It's Time We Stop Settling for Mediocrity in Nursing & Start Expecting Excellence. 2014 Nurse Educator's Conference in the Rockies. Breckenridge, Colorado	*	July, 2014
Phillips, B. & Valiga, T. (2015). It's Time We Stop Settling for Mediocrity in Nursing & Start Expecting Excellence. ATI National Nurse Educator Summit, San Diego, California	*	April, 2015
Phillips, B. , Kuhl, L., & Kuhl, H. (2015). The Cultivation of the Nurse: A view from school to practice. ATI National Nurse Educator Summit, San Diego, California	*	April, 2015
Phillips, B. Excellence in nursing education: Spotlight on virtual learning environments. Presented at Duke University School of Nursing Alumni Weekend Symposium, Durham, NC.		April, 2010
Phillips, B. From expert clinical to novice teacher: changing role and role boundaries. Presented at Duke University School of Nursing Clinical Instructor Intensive, Durham, NC.	*	August, 2010
Phillips, B. Use of the simulation laboratory in nursing education. Presented at Duke University School of Nursing Clinical Instructor Intensive, Durham, NC.	*	August, 2010
Phillips, B. Optimizing learning experiences: innovative partnerships. Duke University School of Nursing Clinical Instructor Intensive, Durham, NC.	*	August, 2010
Phillips, B. From expert clinical to novice teacher: changing role and role boundaries. Presented at Duke University School of Nursing Clinical Instructor Intensive, Durham, NC.	*	January, 2011
Phillips, B. Organizing the day. Presented at Duke University School of Nursing Clinical Instructor Intensive, Durham, NC.	*	January, 2011
Phillips, B. Information Technology Report to entire campus-wide committee: Virtual Environments. Duke University, Durham, NC		March, 2011
Phillips, B. From expert clinical to novice teacher: Changing role and role boundaries. Presented at Duke University School of Nursing Clinical Instructor Intensive, Durham, NC..	*	August, 2011
Phillips, B. Organizing the day. Presented at Duke University School of Nursing Clinical Instructor Intensive, Durham, NC.	*	August, 2011

<u>Presentations: National, Regional, & State</u>	<u>CEU</u>	<u>Date</u>
Phillips, B. Duke Education and Learning in Virtual Environments (DELVE). Presented at Duke University School of Nursing Board of Advisors Meeting, Durham, NC.		October, 2011
Phillips, B. Duke Education and Learning in Virtual Environments (DELVE). Presented at Duke University School of Nursing ABSN Family and Friends Day, Durham, NC.		March, 2012
Lombardi, M. M. (moderator); Turner, B. S., Phillips, B. C. , & Holt, J. E. (panelists). The spirit of innovation. Panel presentation, Duke University School of Nursing Alumni Weekend Symposium, Durham, NC.		April, 2012
Sherwood, G., Phillips, B. , Smith, N., Conner-Kerr, T., Bethea, D., & Darby, R. Interprofessional education [panel]. The Council for Allied Health in North Carolina, Chapel Hill, NC.		September, 2012
Phillips, B. Good faculty... bad feedback. Teaching Conversations, Duke University School of Nursing, Mediasite link: http://mediasite.nursing.duke.edu/Mediasite/Play/c046d7cb02554e36abc10e8...#sthash.HuJDK0pb.dpuf	*	November, 2013

Professional awards and special recognitions

<u>Date(s)</u>	<u>Award / recognition</u>
2009	Faculty Excellence in Teaching Award (Selected by graduating class), Duke University School of Nursing.
2010	Nominated for Distinguished Teaching Award, Duke University School of Nursing FGA.
2012	Distinguished Teaching Award Recipient, Duke University School of Nursing.
2014	Chapter Innovation Award, Sigma Theta Tau International-Beta Epsilon Chapter Faculty Excellence in Teaching Award (Selected by graduating class), Duke University School of Nursing.

Editorial Review

2007 – present	Reviewer for McMaster University for Evidence-based Journals
2009	Reviewer for <i>The Neighborhood, Level 3</i> , Pearson Health Sciences
2012-present	Reviewer for <i>Nursing Education Perspectives</i> , National League for Nursing
2015	Reviewer for <i>Nurse Educator</i> Reviewer for <i>Journal of Nursing Education</i> Abstract reviewer for ATI Education Summit Poster Submissions Abstract reviewer for 6th International Nurse Education Conference