PROMOTING CURRICULUM CHOICES: CRITICAL THINKING AND CLINICAL JUDGMENT SKILL DEVELOPMENT IN BACCALAUREATE NURSING STUDENTS

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ABSTRACT

Critical thinking and clinical judgment have been identified as essential skills for practicing professional nurses (American Association of Colleges of Nursing, 2008; National League for Nursing, 2006). Nurses utilize critical thinking and clinical judgment in their practice every day. While critical thinking and clinical judgment are essential to professional nursing practice, research has indicated that the majority of graduate nurses are not capable of meeting entry-level expectations for clinical judgment (del Bueno, 2005). Nursing educators need to continue to develop and refine educational strategies that promote the development of critical thinking and clinical judgment skills that meet the learning needs of nursing students as well as the health care needs of the public.

Tanner's Theory of Clinical Judgment (2006) provided a framework for this investigation. The purpose of this study was to evaluate the effectiveness of grand rounds as an educational strategy to develop critical thinking and clinical judgment skills in baccalaureate nursing students. Lasater's (2007b) Clinical Judgment Rubric

was used to assess clinical judgment. Assessment Technologies Institute's (ATI) Critical Thinking Assessment was used to assess critical thinking skills.

An experimental, pre-, post-test, mixed method research design was employed in this study. A convenience sample of 22 Level II baccalaureate nursing students from a Midwest nursing program provided the sample. There were four groups that received the teaching strategy and one comparison group that did not receive the strategy. Investigation results were statistically analyzed with Spearman's rho correlation to evaluate the strength of the relationship between critical thinking and clinical judgment. Paired *t*-tests evaluated the differences between critical thinking assessment scores. Independent *t*-tests were utilized to evaluate the difference between critical thinking assessment scores at the second session and clinical judgment scores. Qualitative analysis assessed interviews conducted with participants.

Results indicated there was no significant relationship between critical thinking and clinical judgment. Results also indicated there was no significant difference between participants' scores on the ATI Critical Thinking Assessment at the beginning of the nursing program and at the conclusion of the study. Data indicated there was no significant difference between the intervention groups' scores and the comparison group' scores for the second ATI Critical Thinking Assessment. A significant difference was indicated between intervention groups' and the comparison group's clinical judgment scores, $p < .10$. Qualitative analysis indicated students preferred this strategy to other strategies currently in use at this school.

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CHAPTER I - INTRODUCTION

Critical thinking and clinical judgment have been identified as essential skills for practicing professional nurses (American Association of Colleges of Nursing, 2008; National League for Nursing, 2006). Nurses utilize critical thinking and clinical judgment in their practice every day. They are presented with information provided by the client, assessment findings, clinical lab reports as well as implementing physicians' orders for each client. The nurse must distinguish normal versus abnormal findings, validate findings, group relevant from irrelevant information, recognize inconsistencies, identify patterns, prioritize the findings, develop hypotheses, and act upon the findings (Cruz, Pimenta, & Lunney, 2009; Fero, Witsberger, Wesmiller, Zullo, & Hoffman, 2009; Scheffer & Rubenfeld, 2000). If a nurse gives a client medication for their high blood pressure when their blood pressure is already low, the nurse places the client at risk for more serious consequences by administering the medication. Nurses rely on theoretical and experiential knowledge as well as their intellectual ability in application of critical thinking to healthcare situations (Jarvis, 2008).

Statement of the Problem

We do not need to look far to find examples of nurses who did not employ critical thinking and adequate clinical judgment in the care of the client. Actor Dennis Quaid and his wife struggled to understand how their newborn twins could be dealing with a heparin overdose while in the hospital (ABC News, 2007). The bottle of heparin flush used in the incident looked remarkably similar to regular dose

heparin in a multiple dose bottle. The heparin flush is a mixture of unfractionated heparins, an anticoagulant to help prevent clotting, which is used to maintain patency of intravenous tubing (Thomas, 1997). Regular heparin is 10,000 times more potent than heparin flush. The nurse who administered the overdose did not read the multiple dose bottle correctly. Before administering a medication, a nurse should read the package label to assess for the correct medication, correct route, and correct dose. The nurse in the Dennis Quaid twins' example failed to identify the correct medication. A report by the Institute of Medicine (2000) cited the storage of full-strength medications that can be toxic on nursing units as one of the conditions that has led to a high rate of mistakes in hospitals. Hospital errors account for 44,000 to 98,000 deaths each year. These rates are higher than death rates for breast cancer, motor vehicle accidents, or acquired immunodeficiency syndrome (AIDS).

Nurses in professional practice use critical thinking and clinical judgment on a daily basis in all aspects of their practice. The nursing clinical reasoning process (Jarvis, 2008) is the format that guides nurses in their decisions. Nursing clinical reasoning involves assessment, diagnosis, outcome identification, planning, implementation, and evaluation. At each phase nurses must assess and evaluate how well the client is functioning, and meet the client's healthcare needs. At the interpretation phase, nurses assess subjective as well as objective information to assess the overall functioning of a client. For a client who has arthritis pain, objective information would be: Lab values associated with arthritis, physical assessment of enlarged or warm joints, and immobility of joints. Subjective

information that the nurse would collect include: What makes the pain worse or better; how would the client describe the pain, e.g. burning, throbbing; how would the client rate the pain on a scale of 0-10 with 0 being no pain; where is the pain and does it radiate to another location; and when does it occur, e.g. after activity, early in the morning, or late in the afternoon.

Following assessment, the nurse identifies and groups relevant data to interpret the information. Nursing diagnoses are approved by the North American Nursing Diagnosis Association (Jarvis, 2008) and provide a standardized method of communicating among nurses. For the client with arthritic pain, an appropriate nursing diagnosis would be: Chronic pain related to arthritis as evidenced by client reports of pain. When a nurse identifies a nursing diagnosis appropriate for the client, the nurse will then identify what the desired outcome would be for the client. For the client with arthritic pain, an appropriate outcome would be: Client reports pain levels less than 3 on a scale of 0-10 following administration of pain medication. Once a nursing diagnosis has been identified, interventions are developed to address the nursing diagnosis and it is then implemented.

One client will typically have several nursing diagnoses and it will then be the responsibility of the nurse to prioritize the nursing diagnoses with the most important diagnosis implemented first. Following implementation, the nurse will evaluate if the plan was effective or requires modification. The nursing clinical reasoning process is not a linear progression. The nurse will often return to an earlier step if the client's condition warrants. Perhaps the nurse overlooked pertinent

assessment findings in the first phase that led to an incorrect nursing diagnosis or the interventions that were developed for the nursing diagnosis were not appropriate. Wherever the nurse is in the clinical reasoning process, critical thinking and clinical judgment play an important role in determining the effectiveness of the process and if adjustments need to be made (Flanagan & McCausland, 2007).

However, while critical thinking and clinical judgment are essential to professional nursing practice, research has indicated that the majority of graduate nurses are not capable of meeting entry-level expectations for clinical judgment (del Bueno, 2005). Nursing educators have implemented a variety of teaching strategies to enhance critical thinking and clinical judgment skills with mixed results (Adams, 1999). While nursing students are capable of critical thinking, the focus in preparation programs has traditionally been on mastering content rather than applying critical thinking to situations (del Bueno; Fero, Witsberger, Wesmiller, Zullo, & Hoffman, 2008; Walsh & Seldomridge, 2006). Nursing educators need to continue to develop and refine educational strategies that promote the development of critical thinking and clinical judgment skills that meet the learning needs of nursing students as well as the health care needs of the public.

Purpose of the Investigation

The purpose of this investigation will be to evaluate the effectiveness of grand rounds as an educational strategy to develop critical thinking and clinical judgment skills in baccalaureate nursing students using Lasater's Clinical Judgment Rubric.

Significance of the Investigation

Critical thinking and clinical judgment are essential to professional nursing practice (AACN, 2008; Hoffman, 2008; Vacek, 2009). Students have been assisted in their development of this skill in the past through clinical experiences and classroom experiences (Hoffman, 2008; Anderson & Tredway, 2009). Research examining the development of critical thinking skills with particular educational strategies such as journaling, simulation, case studies, questioning, and concept maps has been small and often has not been replicated (Ellermann, Kataoka-Yahiro, & Wong, 2006; Fonteyn, 2007; Hoffman, 2008; Lasater, & Nielsen, 2009; Ravert, 2008). Often critical thinking exercises and questions follow an instructional method, but students are not actually taught how to use critical thinking and clinical judgment in a healthcare situation. These teaching strategies often do not assist the student in understanding and applying the clinical reasoning process or students struggle to transfer the learning to new situations.

Also, many studies did not reveal significant changes in critical thinking, information about the change, or results were inconsistent (Abel & Freeze, 2006; Daly, 2008; McMullen & McMullen, 2009; Walsh & Seldomridge, 2006). Some studies have revealed no change in critical thinking skill development in nursing students during a nursing program (Adams, 1999; Riddell, 2007; Vaughan-Wrobel, O'Sullivan, & Smith, 1997). Research on critical thinking skills has often focused on practicing nurses' use of critical thinking rather than development of the skill. As a result, many nursing faculty continue to teach as they were taught with a strong

emphasis on content (National League for Nursing, 2003). Despite all this research regarding the development of critical thinking, studies show that only approximately one-third of new graduate nurses have adequate critical thinking skills for entry-level practice (del Bueno, 2005).

Simulation has been shown to be effective in developing students' confidence and cognitive skills (Brannon, White, & Bezanson, 2008; Dillard, Sideras, Ryan, Carlton, Lasater, & Siktberg, 2009). A Simulation Laboratory provides a realistic setting for students to develop their nursing skills in a safe environment. The patient is an interactive, full-body manikin that is controlled via computer. Simulation provides an active environment involving the student in a healthcare situation and allows more time for teacher and student interaction (Brannan, White, & Bezanson, 2008). Students in a Simulation Learning Laboratory are provided with a patient scenario, presenting symptoms, medications, and healthcare provider orders. Typically, three to five students form a group in a simulation learning activity. Following an initial review of the scenario as a group, the students begin caring for the patient. Each student is assigned a role such as medication nurse, documentation nurse, assessment nurse, primary nurse, or communication nurse. With students fulfilling different aspects of the nursing role, not all learning can be comparable. One student may gain more knowledge and confidence in administering medications, but experience limited growth in assessment. Gaps in learning may be evident as well as student understanding of the situation which would affect development of critical thinking and clinical judgment. Following the completion of the scenario,

the students meet with the instructor to review what transpired during the scenario in what is called a debriefing. It has been my experience that students appreciate this period the most. Relating their actions to patient outcomes and interpreting laboratory test results and medication administration enables the students to realize the interconnectedness of all these factors. This reflection on action has been identified by Tanner (2006) as part of clinical judgment and inherent in the learning process.

While students appreciate this alternative educational practice, there are drawbacks to simulation education. In my personal experience, students often voice difficulty with the artificial situation. While the manikin is lifelike, it is not a real person. Students struggle to differentiate between body sounds, such as heart sounds, from the mechanical aspects of the robotics. Also, while the human patient simulator does provide for flexibility in providing a forum for multiple health conditions, a separate manikin needs to be purchased for child scenarios and a separate manikin purchased for a pregnant female. The newest model of Medical Education Technologies, Incorporated (METI) educational manikin costs more than $200,000 (Dotinga, 2004). A more basic model is available at $40,000 but requires much more entry of patient information making it more cumbersome to use. Along with the manikin and hardware that is purchased, software, and employee education are additional costs. Often the number of people who are able to operate the manikin from the computer is limited, since the computer operator requires additional training. Also, there are costs associated with establishing a room-like setting for the

manikin. Another drawback is that the number of students who can be accommodated at one time is limited. Groups are usually three to five students. There are occasions when simulation laboratories accommodate more students by having one group complete the scenario and another group observe the performance. These personnel and financial demands in an educational system with often-limited resources in these areas, often make it unrealistic for a nursing school to establish a simulation laboratory.

A study by Ravert (2008) compared the effectiveness of three educational practices on critical thinking. One group was presented the material through lecture, the second group received the material through simulation, and the third group participated in small group discussions in addition to the lecture. Results indicated that all three groups showed increases in critical thinking with no significant differences between groups. Case studies have been used in nursing to discuss the application of content to a healthcare situation (Hoffman, 2008). However, a limitation of this format has been that the situation-at-hand is discussed. The effects of nursing actions, incorporating laboratory and other test results to represent a more realistic healthcare situation have often been missing. Simulation has provided a more realistic forum for case study material, but has its limitations as well.

Grand rounds has been used in medical education for many years (Mueller, Segovis, Litin, Habermann, & Parrino, 2006). Medical grand rounds provide a forum where critical thinking and clinical judgment skills are developed. Typically one case is presented with current research on the patient's condition, diagnosis, and

management (Lewkonia & Murray, 1995). Medical grand rounds exist in many forms from a primarily lecture format to a small group discussion. Current research and information on the topic is presented followed by collaboration and discussion. Often, medical students are in the same room with physicians who are specialists or generalists, which promotes collegiality as well (Lewkonia & Murray).

Even though this type of educational strategy has been used for many years in medical education, nursing has rarely adopted this practice. Nursing grand rounds have been found to be effective for continuing education (Wolak, Cairns, & Smith, 2008). Providing an alternative learning forum within the practice setting promoted the acquisition of knowledge that is essential to continuing nursing practice. However, no research was found examining the use of grand rounds in nursing education.

While many instructional and curriculum strategies have been developed to facilitate the development of critical thinking and clinical judgment skills, their application appears to be inadequate since the majority of entry-level nurses are not competent in these skills. This investigation will assess the effectiveness of grand rounds as an educational tool to promote critical thinking and clinical judgment skills in nursing students. A few qualitative studies have used content analysis of nursing student verbalizations of their clinical judgment to evaluate critical thinking of a situation (Jones, 2008; Lasater & Nielsen, 2009). Developing effective curriculum that promotes the development of critical thinking and clinical judgment skills is essential to the preparation of future professional nurses.

Theoretical Framework

As an instructor in a baccalaureate nursing program, I have been involved with preparing our future nurses in the clinical setting and classroom. The semesters in nursing school are identified by levels. Level I students are first semester juniors. Level II students are second semester juniors. Level III students are first semester seniors. Level IV students are second semester seniors. It has been rewarding to watch the students develop from nervous and anxious individuals who fear they will harm their client more than help them to independent practitioners able to handle complex situations. While working as an adjunct instructor prior to my fulltime appointment, I supervised students in all four levels of nursing school, from those in their first clinical experience to those about to practice as professional nurses in our healthcare settings. It was fascinating to watch their development as critical thinkers. There was a noticeable growth in the students' critical thinking ability and clinical judgment skills between the second and fourth levels. It would seem that during that period of time, all the preparation that led the student to that point finally came together.

My teaching responsibilities at a baccalaureate school of nursing are Physical Assessment in the first Level of nursing school and also Simulation Laboratory supervision for Levels one through three. My association with students in their first semester of nursing school in a laboratory course that allows me to interact informally with the students often provides a base to a lasting friendliness throughout their nursing program. Working with students in the Simulation Laboratory allows

me to continue to work with students in Levels I, II, and III. Since the Simulation Laboratory is not a graded activity and my associate and I try to provide a relaxed atmosphere, students are able to learn in a less stressful environment. Even though I am on faculty at the nursing school where I will be conducting the investigation, I do not have any influence on students' grades. Therefore, even though I am involved with the students to a certain extent, bias in this area should be limited.

Education Theory. John Dewey (1948) advocated an educational system that facilitated learning through experience. His ideas were so revolutionary that they came to be known as progressive which today denotes a learning environment that incorporates hands-on learning in the natural environment related to the needs and characteristics of the learner. This active involvement in the learning process enables the learner to become more independent and develop his or her own thinking ability. Dewey advocated for experiences in the educational milieu that increased meaning and led to intellectual growth. By having the student more involved in their learning experiences, he argued that students would increase their inquiry ability, thus supporting an inquiring nature through critical thinking. Dewey also supported the idea that reflection was essential to the learning process. This reflection on practice enabled the learner to critically examine their actions and their consequences and to learn from the process.

Research by Brannan, White, and Bezanson (2008) support this education theory. Their study showed that cognitive skills as well as confidence were increased with the use of a human patient simulator. Critical thinking was one of the

components of the cognitive skills assessed. Providing the instruction in a realistic setting enhanced learning in this situation.

Learning Theory. Constructivist theory incorporates experience with learning, enabling the learner to develop his or her own knowledge (Baxter Magolda, 2004; Peters, 2000). Constructivist theory does not represent learning as the accumulation of knowledge, but rather the learner applies what they know to a situation allowing them to interpret the situation. Constructivist theory provides a framework for learning in the nursing school today (Houser, 2007; Schweitzer & Stephenson, 2008). It portrays learning as an active process where the learner is able to build on their prior experience (Holaday & Buckley, 2008; Rothgeb, 2008). Constructivist theory in nursing education is evident in the questioning and discussion practices that help students reflect on their assessments and subsequent implementation of a plan that promotes the development of critical thinking skills.

A study by Jones (2008) utilized problem-based learning as an intervention to increase critical thinking skills in nursing students. Problem-based learning builds on prior knowledge and incorporates that with a framework to address a problem or situation. Her research revealed that nursing students' critical thinking skills improved with this method.

Nursing Theory. Betty Neuman's theory of nursing is a systems-based model (Neuman & Fawcett, 2002). The client is viewed as an open system that interacts with the internal and external environment. Through the processes of interaction, the

person strives for equilibrium that is equated with health. Critical thinking is evident in the process to assess the impact of the internal and external environment stressors.

In a review of teaching strategies aimed at developing critical thinking ability in nursing students, Hoffman (2008) advocated the use of case studies and questioning methods to promote the development of critical thinking. With case studies as well as questioning in the clinical setting, students are required to address the impact of the body systems and how they are impacted by medications, treatments, and nursing care. These methods emphasize the systems approach as outlined by Neuman.

Critical Thinking Theory. Critical thinking as a skill has been investigated, but since definitions for critical thinking vary, it has been challenging to compare research in this area. Facione (1990) of the American Philosophical Association provided one of the earliest definitions of critical thinking that is frequently referenced. Professionals with expertise in critical thinking participated in the process to develop a definition of critical thinking which resulted in cognitive skills and affective dimensions that reflected a practitioner to be "habitually inquisitive, flexible, orderly in complex matters, and diligent in seeking relevant information" (Facione, 1990, p. 2).

Scheffer and Rubenfeld (2000) utilized the same process as Facione to develop a definition of critical thinking in nursing. The results were categorized as "habits of mind" and "cognitive skills" with accompanying definitions to clarify the critical thinking process. The "habits of mind" requisite for critical thinking in

nursing included: "confidence, contextual perspective, creativity, flexibility, inquisitiveness, intellectual integrity, intuition, open-mindedness, perseverance, and reflection" (Scheffer & Rubenfeld, 2000, p. 357). The "cognitive skills" that were identified were: "analyzing, applying standards, discriminating, information seeking, logical reasoning, predicting, and transforming knowledge" (Scheffer & Rubenfeld, 2000, p. 357). Rubenfeld and Scheffer emphasized the importance of context and the practitioner's prior experiences with a situation when using critical thinking. Lasater (2007) also stressed the value of context and experience as applied to critical thinking and clinical judgment when developing the Lasater Clinical Judgment Rubric.

The American Association of Colleges of Nursing (AACN) is an advocacy body for nursing students and baccalaureate schools of nursing. As part of the essentials skills expected of all graduate baccalaureate nurses, critical thinking has been identified as "all or part of the process of questioning, analysis, synthesis, interpretation, inference, inductive and deductive reasoning, intuition, application, and creativity" (AACN, 2008, p. 36). The National League for Nursing (NLN) is an accrediting body for schools of nursing. The NLN Accrediting Commission has identified critical thinking as a program outcome for graduate nurses (NLN, 1997). Outcomes identified by the NLN include challenging other points of view or information provided and constructing alternate ways of knowing. Since professional nursing involves caring for patients with complex problems and the patient's response to treatment is varied, it is imperative that nurses are able to

critically evaluate a healthcare situation and devise a plan to address the issues. In a survey conducted by Henscheid (2008), one-third of employers rated new college graduates as unprepared to employ critical thinking to new situations. This is similar to research by del Bueno (2005) who found only 35% of new graduate nurses capable of using critical thinking adequately.

The California Critical Thinking Disposition Inventory (CCTDI) and the California Critical Thinking Skills Test (CCTST) were developed by Insight Assessment (n.d.) to assess an individual's disposition to think critically and critical thinking skills, respectfully, as they were defined by the American Philosophical Association. Outcomes related to critical thinking and an individual's disposition to think critically were documented as: "truthseeking, open-mindedness, analyticity, systematicity, critical thinking self-confidence, inquisitiveness, and maturity of judgment" (Insight Assessment). The CCTDI was standardized for the general population and is appropriate for individuals in the tenth grade or older. The CCTST was standardized for the general population and is designed for college age or older. The CCTDI and CCTST have been used to assess critical thinking in several nursing studies (Giddens & Gloeckner, 2005; McMullen & McMullen, 2009; Ozturk, Muslu, & Dicle, 2008; Ravert, 2008; Stewart & Dempsey, 2005; Walsh & Seldomridge, 2006; Wheeler, & Collins, 2003). However, since the identified critical thinking aptitudes are not nursing specific and do not relate to the clinical reasoning process, its ability to assess nursing critical thinking in nursing research is limited.

The Watson-Glaser Critical Thinking Appraisal (WGCTA) is another assessment tool for critical thinking utilized in nursing research (Magnussen, Ishida, & Itano, 2000; Vaughan-Wrobel, O'Sullivan, & Smith, 1997; Walsh & Seldomridge, 2006; Zurmehly, 2008). The WGCTA was standardized on the general population and assesses problem solving ability and critical thinking skills of an individual (Watson & Glaser, 1994). The competencies assessed have been identified as: making inferences, assumptions, deductive reasoning, analysis, and evaluation. As with the CCTDI and CCTST, the WGCTA was not based on the clinical reasoning process. Its appropriateness for nursing research is limited.

Assessment Technologies Institute (ATI) (2003) developed the Critical Thinking Assessment (CTA) to assess critical thinking skills of nursing students. The CTA was standardized on nursing students and follows the clinical reasoning process: Interpretation, Analysis, Evaluation, Inference, Explanation, and Self-Regulation. While the use of the ATI Critical Thinking Assessment in research is limited (Whitehead, 2006), it is often utilized by nursing programs to assess students' critical thinking ability at the beginning and end of their nursing program as part of program evaluation.

Clinical Judgment Theory. Clinical judgment was defined by the American Association of Colleges of Nursing (AACN) (2008) as "outcomes of critical thinking in nursing practice." Tanner (2006) developed a clinical judgment model to illustrate the processes used by practicing nurses. Tanner stated that she used the terms clinical judgment and critical thinking interchangeably rather than making critical

thinking a requisite skill employed within clinical judgment. Her flexible model includes the areas of noticing, interpreting, responding, and reflecting to illustrate the process. Tanner's Clinical Judgment Model is illustrated in Figure 1.

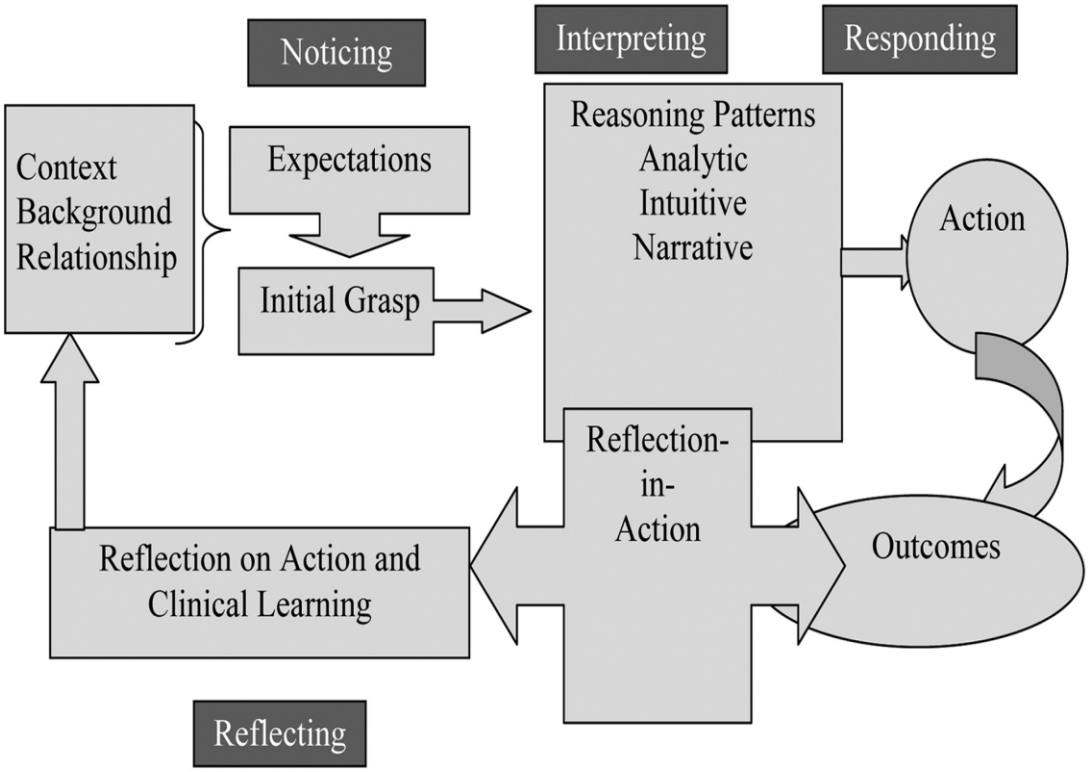

Figure 1. Clinical Judgment Model.

Reprinted with permission from SLACK Incorporated: Tanner, C.A. (2006). Thinking Like a Nurse: A Research-Based Model of Clinical Judgment in Nursing. *Journal of Nursing Education*, *45*(6), 204-211.

Noticing is an expansion of the assessment phase to refer to the nurse's expectations for the situation. This is based on their prior experience in working with patients who have a similar situation, contextual cues, and information learned in courses. When the nurse approaches a patient situation, he or she has already determined expected assessment findings and abilities of the patient based on the history and information in the chart and from the report from the previous nurse caring for the patient. For a patient who has had surgery in the morning, the nurse would anticipate in the afternoon that the patient will probably have strong pain, an incision with scant to moderate drainage, the color of the drainage, and possibly that the patient is nauseous. When the nurse meets the patient and upon assessment determines that the patient has a large amount of drainage with a foul odor and the incision is very red, this deviates from what the nurse anticipated. The nurse also determines on assessment that the patient rates their pain as "5" on a scale of 0-10 with 0 being no pain, their lung sounds are clear, the heart sounds are regular and without extra sounds, and the patient is able to turn in bed with assistance from the nurse. These assessment findings do not deviate from what the nurse expects given the situation. The nurse would also be expected to collect subjective information from the patient regarding their situation. To exhibit appropriate Noticing skills, the nurse would determine that the incision and drainage are not what was expected, but the remaining assessment findings were within the normal range.

Interpreting involves recognizing patterns, differentiating normal from abnormal symptoms to form hypotheses. The nurse needs to understand all the

information that is presented. In the scenario presented previously, the nurse knows that an incision should not show signs of infection and that the amount of drainage is more than expected. Even though the patient is reporting pain, the data regarding the incision takes precedence and requires intervention from the nurse immediately.

Responding refers to how the nurse reacts given the hypotheses formed. When the nurse assesses the inflamed incision with foul drainage, he or she responds calmly to the situation. It is not expected that the nurse would make disparaging remarks or alarm the patient. From noticing and interpreting the information from the patient, the nurse determines that wound care would be appropriate, informs the patient of the intervention, and completes the wound care with expected skill. It is not expected that the nurse would begin the intervention without having all the necessary supplies for wound care or that the intervention would be initiated without informing the patient. It is expected that the nurse would know the steps for appropriate wound care and completes them without difficulty.

Reflection is the nurse's evaluation of the care provided given the situation. This would include how the patient reacts to care provided based on the hypothesis. If the patient did not improve in the management of their pain, then the nurse would interpret the situation given this new information, which would guide their response. This evaluation process is ongoing and continues while the patient is receiving nursing care. The nurse also evaluates their performance and strives to improve. Each phase of the Clinical Judgment Model interacts with the other phases. As with the clinical reasoning process, the progression is not linear with the Clinical

Judgment Model. A nurse may return to an earlier phase if the intervention is not effective or the client is not responding as expected.

The Lasater Clinical Judgment Rubric (Lasater, 2007b) (Appendix A), based on the Tanner Clinical Judgment Model (Tanner, 2006), was developed through extensive observations of nursing students in the Simulation Laboratory. The Lasater Clinical Judgment Rubric has been used as a formative assessment tool for students in Simulation Laboratory as well as communication with clinical faculty regarding students' clinical judgment skills (Cato, Lasater, & Peeples, 2009; Dillard, Sideras, Ryan, Carlton, Lasater, & Siktberg, 2009; Nielsen, 2009).

Research Questions

For the purpose of this investigation the following questions are developed:

1. How do nursing students use critical thinking skills and clinical judgment to resolve a healthcare dilemma?
2. Does grand rounds as an educational strategy promote development of critical thinking and clinical judgment in nursing students?

Assumptions

For the purpose of this investigation, it is assumed:

1. Nursing students in baccalaureate nursing programs have made successful progression through nursing curriculum.
2. Nursing students in baccalaureate nursing programs present a range of abilities and experiences.

Delimitation

For the purpose of this investigation, the following delimitation is applied:

1. The participants constitute a purposeful sample that limits transferability to other populations.

Limitations

For the purpose of this investigation, the following limitations were identified:

1. Since this is a study at one nursing school, results may not be reflective of critical thinking and clinical judgment skills development at other professional nursing schools.
2. Causal relationships cannot be established with a non-experimental design.

Definitions of Variables

Critical Thinking. For this investigation, critical thinking was theoretically defined with the AACN definition as "all or part of the process of questioning, analysis, synthesis, interpretation, inference, inductive and deductive reasoning, intuition, application, and creativity" (AACN, 2008, p. 36). Critical thinking was operationally defined with the ATI Critical Thinking Test.

Clinical Judgment. For this investigation, clinical judgment was theoretically defined with the AACN definition as "outcomes of critical thinking in nursing practice" (AACN, 2008, p. 36). Clinical judgment was operationally defined with the Lasater Clinical Judgment Rubric.

Summary

Baccalaureate nursing programs have the responsibility of preparing graduates to function as professional nurses. A professional nurse utilizes critical thinking and clinical judgment in their practice multiple times daily. However, research has indicated that the majority of graduates are not capable of meeting entry-level expectations for critical thinking and clinical judgment. Research in these areas has highlighted aspects of different educational strategies that have yielded inconsistent or inconclusive results or results that show modest gains. Grand rounds as an educational strategy provides for learning in a realistic environment with reflection on practice that were emphasized by Dewey. Tanner also recognized the importance of reflection on practice in developing clinical judgment. Constructivist theory and Tanner's Theory of Clinical Judgment both highlight the importance of building on previous learning. This investigation will examine the effectiveness of grand rounds as an educational strategy in developing critical thinking and clinical judgment.

CHAPTER II – LITERATURE REVIEW

Critical thinking and clinical judgment have been identified as essential to nursing practice. This chapter will review current research on critical thinking and clinical judgment. Since these skills are often referred to interchangeably, research regarding both skills will be examined together. Educational and teaching strategies that have been created to promote the development of these skills will also be reviewed.

Critical Thinking and Clinical Judgment

Throughout any given day, a nurse uses thinking in a variety of situations. Thinking is a process and is not necessarily linear in form. Costa (1985, p. 141) identified traits that are to be found in thinking as: "remembering, repeating, reasoning, reorganizing, relating, and reflecting." Critical thinking differs from general thinking in that the nurse now applies reason or logic to the situation to question the circumstances, seek additional evidence, and to evaluate the outcomes or process. In a study by Ellermann, Kataoka-Yahiro, and Wong (2006) students identified logical thinking and logical reasoning as important in critical thinking and clinical judgment. Logic was rated higher than other forms of thinking such as inductive reasoning or conceptual linking.

Scheffer and Rubenfeld (2000) utilized the Delphi technique to develop a definition of critical thinking in nursing. The results were categorized as "habits of mind" and "cognitive skills" with accompanying definitions to clarify the critical thinking process. The "habits of mind" requisite for critical thinking in nursing

included: "confidence, contextual perspective, creativity, flexibility, inquisitiveness, intellectual integrity, intuition, open-mindedness, perseverance, and reflection" (Scheffer & Rubenfeld, 2000, p. 357). The "cognitive skills" that were identified were: "analyzing, applying standards, discriminating, information seeking, logical reasoning, predicting, and transforming knowledge" (Scheffer & Rubenfeld, 2000, p. 357). Rubenfeld and Scheffer emphasized the importance of context and the practitioner's prior experiences with a situation when using critical thinking. Lasater (2007a) also stressed the value of context and experience as applied to critical thinking and clinical judgment when developing the Lasater Clinical Judgment Rubric which is based on the Tanner Clinical Judgment Model (2006). In many nursing studies, critical thinking and clinical judgment are used interchangeably. However, despite research and implementation of teaching strategies designed to increase critical thinking and clinical judgment skills, research by del Bueno (2005) and Henscheid (2008) has indicated that the majority of graduate nurses do not meet entry-level expectations for critical thinking. This finding was similar to results of graduate nurses and critical thinking ability research by del Bueno (1990) in an earlier study.

Critical thinking as a component of clinical reasoning that leads to clinical judgment is essential to professional nursing practice (AACN, 2008; Hoffman, 2008; Vacek, 2009). Students have been assisted in their development of these skills in the past through clinical experiences and classroom experiences (Hoffman; Anderson & Tredway, 2009). In clinical experiences, students function as a nurse while being

supervised by a clinical instructor or a preceptor. In the clinical setting, students perform nursing skills ranging from health promotion such as blood pressure screening clinics to postsurgical care. As the student's knowledge base increases, they are able to care for patients with increasing acuity. In the first clinical experience, students are focusing on basic patient care such as oral care and bathing. They are not administering medications at this point since they have not had that content in the classroom. Critical thinking and clinical judgment are required for all nursing actions, however. If the student attempts to ambulate a patient for the first time following surgery, they will need to consider the patient's state at that time. If the patient is in severe pain, dizzy, or nauseous, then the student will need to attend to those patient needs prior to ambulation. Nurses view the patient holistically, considering the disease process, current status, and patient desires when planning and implementing care (Lasater, 2007a). This purposeful thinking process proceeds on a novice to expert continuum, with expert nurses responding automatically with intuition rather than proceeding through a series of steps to make appropriate clinical judgments (Martin, 2002).

Tanner (2006) reviewed approximately 200 studies and developed the following conclusions regarding clinical judgment: 1) personal history including theory preparation will influence a nurse more than objective data; 2) communication with the patient is as valuable as well as what the nurse expects given the patient condition and disease process; 3) the mileu of the nursing unit impacts the judgments made; 4) many different thinking processes influence clinical judgment;

5) evaluating the patient's response to care as well evaluating personal performance in a situation is vital to improving clinical judgment. Nurses take not only didactic information, but their prior experiences with similar patient conditions to assess a situation. This also includes their personal experience with a situation. If a nurse has a son who is diabetic and relies on insulin to regulate his blood sugar, then he/she may recognize similar symptoms in a patient more readily than a nurse who does not know anyone personally with diabetes. The ability of nurses to communicate effectively with patients is vital to their care. A nurse who interacts with a patient in a hurried manner, while being technically correct, fails to establish a working partnership with the patient. In this way, the patient may be reluctant to disclose information that would influence their situation. Different nursing units exhibit a variety of personalities. If the atmosphere of a nursing unit is collaborative and supportive, a nurse is more likely to seek advice or discuss a patient situation with other professionals, which would enhance patient care. However, if the atmosphere on the unit is punitive or stresses completing patient care without seeking assistance from others, then the nurse does not benefit from the knowledge and experience of other nurses. In addition to logic, nurses use a variety of processes including inductive and deductive reasoning when making clinical judgments. Reflection on practice is vital for improvement. Recognizing how a patient responded to the treatment and care provided contributes to development of clinical judgment. Also, evaluating personal performance enables a nurse to improve his or her own abilities.

Given that critical thinking and clinical judgment are multifaceted, Lasater (2007b) developed a rubric to assess clinical judgment based on the research of Tanner (2006). By identifying the concepts involved in the processes, outcomes could be clearly delineated. Lasater also identified four levels of each clinical judgment concept from *beginning* to *exemplary*. In this way progress can be more readily evaluated. The Rubric can also facilitate communication between faculty and students regarding expectations. When the Rubric is used consistently, students are able to develop a structure for critical thinking and clinical judgment.

Healthcare content is constantly changing and evolving. New research dispels former practices. One example is infant placement in cribs. In 1980, the accepted practice was to place a newborn infant on the abdomen when resting to lessen the chances of aspirating. However, more recent research has shown that infants have a decreased chance of aspirating and sudden infant death syndrome when placed on their backs in the crib. It is nearly impossible, also, for faculty to cover all content in the nursing curriculum. Therefore, it is more relevant to teach students to be lifelong learners. The more nurses practice, the more they realize how much they need to know. Inherent in this process is teaching critical thinking and clinical judgment to nursing students as principles to follow when providing care (Martin, 2002; Nielsen, 2009; Walsh & Seldomridge, 2006).

Teaching Strategies

Given its importance and relevance to nursing practice, it is no surprise that many teaching strategies have been developed to promote critical thinking and

clinical judgment in nursing students. However, often the research is weak or the results conflicting which limits its application in the educational forum (Adams, 1999; Staib, 2003; Walsh & Seldomridge, 2006). The evidence is often inconclusive or anecdotal which limits its applicability to current practice. Critical thinking skill research has often focused on practicing nurses' use of critical thinking rather than development of the skill. As a result, many nursing faculty continue to teach as they were taught with a strong emphasis on content (National League for Nursing, 2003). Lecture is the easiest method to convey a large amount of content within a limited time frame. Even if question and answer periods are allowed, the learning style is passive which limits the students' opportunity to question or for the students' assertions to be challenged. The outcome is that students do not learn how to think critically, but focus more on learning facts that can be recalled easily (McMullen & McMullen, 2009; Neuman & Fawcett, 2002).

Research examining the development of critical thinking skills with particular educational strategies such as journaling, simulation, case studies, questioning, and concept maps has been small and has not been replicated (Adams, 1999; Ellermann, Kataoka-Yahiro, & Wong, 2006; Fonteyn, 2007; Hoffman, 2008; Lasater, & Nielsen, 2009; Ravert, 2008). A comparative analysis of research in critical thinking by Adams yielded several weaknesses. Deficiencies in the research include lack of a comparison group, nonrandom sampling, and small sample sizes (Adams). Also, although instruments to assess critical thinking are available, most are applicable to the general population and do not assess critical thinking within the clinical

reasoning process (Ravert). Often critical thinking exercises and questions follow an instructional method, but students are not actually taught how to use critical thinking and clinical judgment in a healthcare situation. These teaching strategies often do not assist the student in understanding and applying clinical judgment or students struggle to transfer the learning to new situations. Vacek (2009) postulated that current nursing curriculum disempowers students. She theorized that rather than becoming independent thinkers who could critically evaluate a situation, students actually become more dependent and obedient. In nursing practice it is essential that nurses are able to process multiple problems, analyze a situation, critically evaluate evidence, and be assertive in the process. Nursing curriculum often discourages these traits in students.

Reading Comprehension. Reading is a large component of nursing education. Students are expected to read large amounts of material and comprehend the text with each class meeting. Prior to the clinical day, the students research the pathophysiology of the patient's condition, the medications the healthcare provider has ordered for the patient, laboratory and diagnostic tests for the patient, and has developed nursing diagnoses based on the information from the chart. Students need to be able to apply content to new situations.

Hoffman (2008) examined the effects of reading comprehension on critical thinking, successful matriculation, and initial pass rates on the licensing examination, the National Council Licensure Examination for Registered Nurses. Reading

comprehension was found to be significant in relationship to the variables and emphasizes the relevance of students' ability to comprehend, understand, and apply the material. Hoffman reviewed various instructional strategies to assist students in the development of their reading ability and critical thinking. Assorted prompts can be used to promote the students' ability to critique the assigned reading rather than reading merely for comprehension. Examples of the strategies include: researching material not understood in the reading; constructing questions to address the deficiencies in their understanding of the reading; and summarizing the material read. Prompts support the development of critical thinking by challenging the student to critique, evaluate, and analyze the material. These enhance cognitive skills that have been associated with critical thinking.

Reflective Writing. Dewey (1948) was the first to recognize the importance of reflection on action as a means to reinforce learning. Reflection on nursing practice has been identified as essential to developing clinical judgment (Tanner, 2006; Vacek, 2009). Providing students with a guide or template for evaluating clinical judgment can assist students in developing those skills. Dillard, Sideras, Ryan, Carlton, Lasater, and Siktberg (2009) assessed the journals of 25 nursing students for evidence of clinical judgment with the Lasater Clinical Judgment Rubric (2007b). The Rubric provided a format to evaluate students' skills. The study revealed that students tend to focus more on tasks than on the clinical reasoning process. The Lasater Clinical Judgment Rubric has also been used by students to monitor their progress (Lasater and Nielsen, 2009). Faculty are able to apply an

objective measure to identify weaknesses or misperceptions of students. In this manner, corrections in practice and clinical judgment can be remediated sooner rather than allowing students to develop erroneous patterns.

Writing assignments that focus on concepts have also been used to develop critical thinking and clinical judgment (Ellermann, Kataoka-Yahiro, & Wong, 2006). In their writing, students develop their clinical reasoning ability, which enhances their clinical judgment. Students are also able to demonstrate critical thinking skills such as logical reasoning and critiquing which provide a base to developing nursing practice.

Questioning. Nursing instructors often use questioning techniques to evaluate students' readiness for practice or to validate understanding. Prior to the start of the clinical day, the clinical instructor questions the student. The student needs to demonstrate an understanding of factors affecting the patient including the disease process, diagnostic tests, and appropriate nursing interventions. During the clinical experience, the clinical instructor questions the student about their patient and how their patient is progressing in their treatment. This type of critique and self-reflection has been shown to develop critical thinking (Williams, 2001). It provides an open dialogue for students learning to think like a nurse.

Nursing education is often content laden, but it has become evident that students also need instruction in the process of thinking (Forneris & Peden-McAlpine, 2009). Forneris and Peden-McAlpine studied new graduates over the six months post-graduation and found that this open dialogue promoted critical thinking.

The new graduates reported greater comprehension of the clinical judgments. Walsh and Seldomridge (2006) supported this practice with nursing students as a way to model clinical reasoning. Murphy (2004) advocated open dialogue with nursing students to promote clinical reasoning, as nursing is such a process. It is essential that students have an understanding of the content in healthcare, but since research keeps evolving the body of knowledge, it is also imperative that nurses understand the processes involved.

However, the cognitive level for the questions has to be considered. Students often use questions to answer specific questions rather than seeking or clarifying information that would provide more information. By challenging students with open-ended questions, students are then more likely to respond with higher-level thinking (Walsh & Seldomridge, 2006). When students apply higher-level thinking, they are more likely to continue this practice once they are working as a professional nurse. Walsh and Seldomridge also related the inverse relationship of critical thinking: That if students make poor decisions, the consequences of those decisions should be allowed to unfold. However, the decisions should not be allowed to negatively impact patient care. Sometimes, though, the best lessons learned are from the mistakes that are made.

Concept-based Learning. After the clinical experience, students must incorporate all the information relevant to the patient into a concept map. The concept map is based on objective as well as subjective information of the patient. Concepts maps provide a visual representation of a patient's condition, disease

process, and treatments (Daley, 1999; Ellermann, Kataoka-Yahiro, & Wong, 2006). Students are able to graphically present material and identify relationships among patient factors. Daley asserted that since students' were better able to develop a concept map over the course of a semester, their critical thinking skills had increased. However, while student comments regarding the intervention revealed an increased ability to recognize relationships, students also cited the mechanics of completing a concept map as contributing to their improved ability at constructing a concept map. Abel and Freeze (2006) achieved similar results in their comparison of two concept map constructions by nursing students. The researchers associated an improved ability at constructing concept maps with improved critical thinking skills. While this may be true, no evaluation of critical thinking skills was included in these studies. In this study, researchers graded the concept maps and assigned a score based on the student's ability to identify the patient needs and to correctly illustrate the relationships among the patient needs. The mean scores for the concept maps increased each semester of study. Paired *t* tests were completed that resulted in a value of -4.75, $p = 0.05$.

Concept papers have also been used to develop critical thinking and clinical judgment. Recognizing connections with concepts assists students to move beyond focusing on content and to understand the impact of clinical judgment on patient care (Ellermann, Kataoka-Yahiro, & Wong, 2006; Nielsen, 2009). Nursing is a practice discipline and it is important to understand the processes involved. Facts and procedures often change in healthcare as research repudiates beliefs and practices or

new information comes to light. If a nurse has a good understanding of the concepts involved, that information can be applied to multiple situations rather than relying on procedures. Concept-based learning enhances student understanding of the processes involved. Nielsen (2009) has used concept papers to develop students' critical thinking and clinical judgment. The papers allowed students to identify the concepts, interpret the concept as applied or exhibited in the patient, and then to evaluate the patient responses or outcomes to nursing action. Concept papers facilitate inquisitive nature and to challenge conventional thought through exploration of ideas. Nielsen (2009) used concept-based learning to assess students' clinical judgment. Nielsen based her research on Tanner's Clinical Judgment Theory (Tanner, 2006) and assessed development with the Lasater Clinical Judgment Rubric (Lasater, 2007b). Tanner explained in her theory that she used the terms clinical judgment and critical thinking interchangeable. While specific gains were not reported, examples of growth and attainment of course objectives were provided that demonstrated increased critical thinking.

Problem-based Learning. In problem-based learning (PBL), students are provided a patient and context to work individually or in groups to resolve the problem presented in the situation. PBL can be either concept or content focused with a specific problem to identify and determine a course of treatment. Through Socratic questioning, faculty are able to assess development of students' critical thinking. Jones (2008) used PBL to assess critical thinking skill development in nursing students utilizing Bloom's Taxonomy of cognitive domains. The

intervention group showed increases in cognitive ability, which has been associated with gains in critical thinking skills, as well as critical thinking skills, $p < 0.000$. PBL allows students to develop collaboration skills as well by working in groups. Anderson and Tredway (2009) theorized that involving students in the learning process increased students' understanding of the material. Jones also concluded that by working in groups, students were able to learn from each other and were more likely to posit questions.

Case Studies. With another form of problem-based learning, case studies, students are presented with a patient in context and analyze the situation. Case studies allow students as a group to identify problems in the situation, develop a course of care, and discuss potential problems. Faculty can help facilitate the discussion as well as pose questions that would stimulate critical thinking and foster development of clinical judgment. Through Socratic questioning faculty can challenge students' thinking and help them develop working hypotheses in an environment that is less stressful than the clinical environment (Riddell, 2007; Sandstrom, 2006). Students are able to apply what they have learned in theory to resolve patient situations, which makes them a more active participant in their learning. Case studies can be used with a whole class, but small groups of three to six students allow for more student participation. Working in small groups allows for greater participation. Students are also able to learn from each other and to learn to work together, which are essential to successful nursing practice (Sandahl, 2009).

Learning is reinforced by faculty reviewing the case study to emphasize the important concepts or points of the case study (Hoffman, 2008).

Stuenkel (2009) used case studies in the classroom to develop students' ability to recognize important aspects of the case, prioritize the concerns, and formulate what additional information would be required. No formal assessments of critical thinking were obtained, but anecdotal evidence suggested this method enhanced student learning. Cruz, Pimenta, and Lunney (2009) used case studies to assess critical thinking skill development. Two case studies were presented and the nursing students' ability to correctly identify information and make interpretations was assessed. The responses were assessed with a Likert scale used in prior case study research to determine the participant's ability to match expected criteria from pretest to posttest scores. Scores for case study number one were significant (z = -2.63, p = .008), as were scores for case study number two (z = -2.04, p = .042). Critical thinking skills were not assessed. However, the assessment tool measured the participant's ability to adequately assess the case study, which is a cognitive skill that is associated with critical thinking skills.

Simulation. Simulation is the newest educational strategy that has its roots in problem-based learning, cooperative learning, and case study. Students, typically in groups of three to five participants, are presented with a lifelike manikin controlled by computer that represents an actual life event. There are three phases to a simulation: pre-simulation, simulation, and debriefing. During pre-simulation,

students discuss the disease process of the patient, laboratory tests, medications, and expected course of treatment. During the simulation, students interact with patient, which is a computer-controlled manikin, as a nurse. Typically, each student fulfills a different role of a practicing nurse: assessment, administering medications, documentation, and communicating with healthcare providers regarding patient status. In the debriefing phase, students discuss with faculty how the scenario unfolded. During this time, students are able to process their feelings and come to a better understanding of the situation. In this safe environment, they are able to practice and make mistakes without negative consequences for patients. For a patient with congestive heart failure, they are able to talk about their apprehension of caring for someone who is having difficulty breathing. They are also able to come to an understanding that, given this respiratory distress, the healthcare provider did not want to increase the delivery of oxygen for the patient, but instead ordered medications to be given that would promote removal of fluid from the lungs to facilitate breathing. Students have reported they appreciate the collaborative learning environment that simulation provides (Lasater, 2007a). Participants are able to learn from each other's experiences as well as the questions that other students pose. Learning is further enhanced by faculty's reinforcement of key concepts and critique of the students' performance (Lasater, 2007b). While simulation is a form of case study, the realistic environment encourages greater participation of the students which reinforces learning (Stuenkel, 2009). Simulation allows students to apply and practice critical thinking and clinical judgment as well as content learned in theory

courses. This direct learning of the processes involved in nursing practice has been cited as a reason why students are deficient in these skills (National League for Nursing, 2003; Neuman & Fawcett, 2002; Thompson & Bonnel, 2008).

Research by Bambini, Washburn, and Perkins (2009) revealed that students reported an increased level of confidence and improved clinical judgment with the use of simulation. Lasater (2007b) demonstrated improvement in students' clinical judgment with the use of simulation. Lasater based her definition of clinical judgment on Tanner's Model of Clinical Judgment which used the terms critical thinking and clinical judgment interchangeably. A study by Ravert (2008) assessed the development of critical thinking skills with simulation. Her results indicated growth in critical thinking skills as assessed with the CCTDI and CCTST, but the non-simulation group and simulation group scores were not statistically significant. It was theorized that the small sample size was a limitation in the study. Research by Brannan, White, and Bezanson (2008) revealed cognitive skills growth with the use of simulation. When compared with students who received comparable content through a lecture format, participants in the simulation achieved significantly higher scores on the cognitive skills test. Research by Thompson and Bonnel (2008) with simulation showed increases in pretest and posttest scores, although it was not reported if these gains were statistically significant. Increases in cognitive skills are associated with increases in critical thinking and clinical judgment.

Performance Based Development System. The Performance Based Development System (PBDS) is an assessment tool that has been applied to practicing nurses to evaluate their critical thinking and clinical judgment skills. The PBDS was used by del Bueno (1990; 2005) in her studies evaluating critical thinking and clinical judgment of entry-level nurses. The PBDS results range from "unacceptable" to "exceeds expectations." Entry-level nurses are expected to be able to complete assessments, recognize deviations, analyze data, prioritize problems, and collaborate with other healthcare professionals as part of safe practice. PBDS has also been used with new graduate nurses. When paired with a clinical coach, the new graduate is able to receive individual instruction and feedback regarding critical thinking and clinical judgment. This approach has been shown to be more effective than group internships (del Bueno, 2005). With hospital-sponsored internships, new graduates meet periodically, typically over a period of six to 12 months. PBDS gains in critical thinking and clinical judgment were realized within ten to 12 weeks. Research by Fero, Witsberger, Wesmiller, Zullo, and Hoffman (2008) also supported the use of PBDS with new graduates. A strength of using this system is that it can also identify individual learning needs. This type of approach would be more effective than the group approach where everyone receives the same instruction.

Summary

Nursing is not so much accumulation of knowledge, but being able to apply that knowledge to new and varied situations by way of a process that is enhanced with critical thinking. Much of the research on critical thinking and clinical judgment has not used nursing students but practicing nurses. Small sample sizes and the lack of standardized instruments have limited the impact of research results for development of critical thinking and clinical judgment. Other weaknesses in research have been no random assignment of the sample to a study group and no control group (Adams, 1999).

While the various instructional strategies presented have benefit for learning content and applying their knowledge to novel situations, the results do not indicate that the strategies are effective since the majority of graduate nurses do not meet entry-level expectations for critical thinking. Research has indicated that students prefer to learn in groups as in simulation, problem-based learning, and case study. Research has shown that students' critical thinking ability increases with questioning by the instructor. Simulation has been shown to increase confidence, critical thinking, and technical skills, but the costs involved in establishing a simulation learning laboratory can be prohibitive for many nursing programs with tight budgets.

Students have shown they are capable of learning copious amounts of information. However, students also need experience in learning the process of clinical judgment and learning how to apply critical thinking to their judgment.

Teaching strategies that are effective in developing critical thinking and clinical judgment are most effective when students are active participants in the learning process. However, many strategies are largely passive. Research with better rigor is needed to develop effective teaching strategies that promote development of critical thinking and clinical judgment in nursing students.

CHAPTER III – METHOD

Effective teaching strategies for developing critical thinking and clinical judgment skills in nursing students need to be examined through research. This chapter will provide a review of the research method utilized in this study. Factors than enhanced the validity of the qualitative portion of the study will be presented followed by a description of the sample for the study. Also presented here are the data collection procedures and data analysis of the research.

An experimental, pre-, post-test, mixed method research design was employed in this study. In this investigation trustworthiness was supported in a variety of ways. While collecting data through interviews, participants had the opportunity to review the transcripts for accuracy and suggest changes as appropriate. Multiple sources of data including observations, interviews, and document reviews of school critical thinking assessments were utilized. Also, the Simulation Laboratory Coordinator assisted in the evaluation of participant responses. The Simulation Laboratory Coordinator also provided for colleague collaboration regarding the investigation process and limited bias. Transferability was enhanced with a representative sample for the study. Baccalaureate nursing students in their second semester of study in a university program provided the sample. Students volunteering to participate were representative of the nursing program. Since entry to the nursing program is competitive, the study sample may possess different characteristics from nursing students at a comparable point in their education. Dependability was enhanced by videotaping of the sessions with the

participants. Video recordings were transcribed. As students worked through the healthcare dilemma, I identified themes and clarified with the students their intent in order to appropriately assess the process with the rubric. Participants had the opportunity to review the transcripts and verify accuracy. Pseudonyms were assigned to the participants. Transcripts and videos on digital video disc (dvd) recordings are maintained in a locked file cabinet in my work office. Tools used to assess participants' statements are retained with other research data. Detailed records including any notes are maintained with research data. Confirmability depended on my ability to objectively approach the research process and interpret the results. Colleague consultation and consultation with my dissertation adviser addressed this threat to trustworthiness.

Sample

Sampling method. Subjects were a convenience sample of volunteers from the Level II nursing class from a Midwest baccalaureate school of nursing. This baccalaureate nursing program consists of two years of fulltime study after the student has completed two years of prerequisite courses. A level designates each semester of study. Level II students are second semester juniors who have completed the first semester of the program.

Inclusion criteria. Investigation participants were baccalaureate nursing students in the second Level of their nursing program at the university.

Exclusion criteria. Investigation participants did not include nursing students from other Levels at this baccalaureate school of nursing. Investigation participants

did not include nursing students from other baccalaureate nursing programs. Investigation participants did not include nursing students from associate degree nursing programs.

Protection of Human Subjects

The Institutional Review Boards at The University of Kansas and Baker University approved this investigation (Appendix F). Following being informed of the investigation and its intent (Appendix B), signed consent was obtained from participants (Appendix C). Participants were allowed to decline to be involved in the investigation at any time. No risks or discomforts were associated with this investigation and there were no identified monetary benefits. Students who participated in the study or those who completed the self-study modules received a 1% bonus to their grade in the Level II medical-surgical course.

Data Collection

Following a short presentation regarding the study (Appendix B), volunteers were solicited. Students who elected not to participate but wanted to receive the 1% bonus to their grade were provided with the option of completing self-study modules. The modules were part of the Assessment Technologies Institute skills modules that included: Medication Administration 4, Blood Administration, Physical Assessment-Adult, Pain Management, and IV Therapy. Participants then signed an informed consent form that also explained the research (Appendix C). Participants retained a copy of the informed consent. Participants were randomly assigned to an intervention group or the comparison group by drawing names from a hat. A group

of three to six students comprised an intervention group. There were four intervention groups. A separate group of four students comprised the comparison group. The intervention groups met twice during their Level II semester in nursing school. The comparison group met once during their Level II semester. As a group, the students were asked to resolve a healthcare dilemma verbally. The healthcare dilemmas were taken from the Medical Educational Technologies, Incorporated (METI), Program for Nursing Curriculum Integration (PNCI). The session was videotaped. Information was provided to students at the beginning of the session that described a patient's healthcare status that included physical assessment data, healthcare provider orders, laboratory results, x-ray results, and medications. The PNCI used for the instructional session for the intervention groups was "Postoperative Hemorrhage" (DuBose & Karmel, 2008). The PNCI used for the intervention and comparison groups was "Postoperative Care of the Patient with a Ruptured Diverticulum" (Doyle & George, 2008). Content validity has been established by METI. Both of the PNCIs were designed for Level II nursing students. Through interaction with each other, the students worked through the dilemma. The researcher was present to answer questions and to provide updates on the patient's condition or test results. At the end of the first session with the intervention groups, discussion concluded the session using Lasater's Clinical Judgment Rubric as a format to relate how well the students were able to notice important aspects of the patient's condition, the effectiveness of how well the students interpreted the information and responded to the situation, and the students'

reflections of the situation. After the second session participants were interviewed regarding critical thinking and clinical judgment, their perspective of the effectiveness of the educational strategy as well as teaching strategies shown to develop these abilities, and their perspective of how this strategy has influenced their class performance and clinical practice (Appendix E). Participants completed the Assessment Technologies Institute's Critical Thinking Assessment at the completion of the study. Current scores on the Critical Thinking Assessment were compared to the scores on the same Critical Thinking Assessment that students completed at the beginning of their nursing program to assess growth. The comparison group did not receive the educational strategy from the researcher or discussion following the scenario. The reasoning used by individual students in the comparison and intervention groups to resolve the dilemma was assessed using Lasater's Clinical Judgment Rubric.

Interviews were recorded and transcribed by the researcher to ensure accuracy. Clinical judgment data were analyzed using content analysis by the researcher and the Simulation Lab Coordinator using Lasater's Clinical Judgment Rubric. The Simulation Lab Coordinator who is a registered nurse, is familiar with nursing students and Simulation Laboratory learning as well as Tanner's Clinical Judgment Model and Lasater's Clinical Judgment Rubric. Documents were reviewed to obtain grade point averages and ages of participants. Review of documents at this program were examined to evaluate the growth of critical thinking

skills of all baccalaureate nursing students through pre-program and post-program assessments currently conducted by the nursing school.

Instruments

Critical Thinking Assessment. Assessment Technologies Institute (ATI) (2003) developed the Critical Thinking Assessment (CTA) to assess critical thinking skills of nursing students. The CTA is a 40-item, multiple-choice assessment that was standardized on nursing students and follows the clinical reasoning process: Interpretation, Analysis, Evaluation, Inference, Explanation, and Self-Regulation. Assessment results for the ATI Critical Thinking Assessment are converted to a composite score that can be compared with program and national result. CTA results also generate a percentile rank at the program and national levels. While the use of the ATI Critical Thinking Assessment in research is limited (Whitehead, 2006), it is often utilized by nursing programs to assess students' critical thinking ability at the beginning and end of their nursing program as part of program evaluation.

Lasater Clinical Judgment Rubric. The Lasater Clinical Judgment Rubric (Lasater, 2007b) (Appendix A), based on the Tanner Clinical Judgment Model (Tanner, 2006), was developed through extensive observations of nursing students in the Simulation Laboratory. For each of the four dimensions identified by Tanner, Noticing, Interpreting, Responding, Reflecting, descriptives were formulated to describe developing clinical judgment skills. The Lasater Clinical Judgment Rubric has been used as a formative assessment tool for students in Simulation Laboratory as well as communication with clinical faculty regarding students' clinical judgment

skills (Cato, Lasater, & Peeples, 2009; Dillard, Sideras, Ryan, Carlton, Lasater, & Siktberg, 2009).

Data Analysis

Interviews were assessed qualitatively through content analysis by identifying patterns, themes, and processes (Merriam, 2009). After the interviews were transcribed, recurring patterns were noted in the margin of the transcript, and sorted into categories. Once recurring patterns were noted, themes or processes were developed that captured the interview content. Lasater's Clinical Judgment Rubric was converted to an ordinal scale with 1 representing *beginning* clinical judgment and 4 representing *exemplary* clinical judgment. The researcher and the Simulation Lab Coordinator scored participants' performance during the session with the Lasater Clinical Judgment Rubric Scoring Sheet (Appendix G) (Lasater, personal communication). The same researcher who developed the Lasater Clinical Judgment Rubric developed Lasater's Clinical Judgment Rubric Scoring Sheet. The two Lasater Clinical Judgment assessment tools provided a structured format to assess the students' performance that reduced subjectivity from the researcher. Inter-rater reliability was 98.49%. Participant scores' on the ATI Critical Thinking Assessment at the beginning of the nursing program and at the end of the study were evaluated with paired *t*-tests (Polit & Beck, 2004). Participants' scores between groups on the second ATI Critical Thinking Assessment were evaluated with independent *t*-tests. Spearman's rho was used to assess the relationship between clinical judgment and

critical thinking (Polit & Beck). Participants' scores on the Lasater Clinical Judgment Rubric were assessed with independent *t*-tests. The data were analyzed with the Statistical Package for the Social Sciences (SPSS), version 16.0.

Summary

The Institutional Review Boards at the University of Kansas and Baker University approved this study. Level II baccalaureate nursing students at a Midwest baccalaureate school of nursing provided the convenience sample for this investigation. Participants were randomly assigned to either an intervention group or the comparison group. Groups were comprised of 3-6 students. There were four intervention groups and one comparison group. Through group discussion, the participants resolved a healthcare dilemma together. A scenario from the Program for Nursing Curriculum Integration through Medical Educational Technologies, Inc., was the healthcare dilemma. Participant performance in clinical judgment was assessed by the researcher and the Simulation Lab Coordinator with the Lasater Clinical Judgment Rubric. All participants completed the Assessment Technologies Institute's (ATI) Critical Thinking Assessment. This was the same assessment that students completed at the beginning of the nursing program. Participants' scores between the first and second administration of the ATI Critical Thinking Assessment were assessed with paired *t*-tests. Independent *t*-tests assessed the difference between groups for the two administrations of the ATI Critical Thinking Assessment. Spearman's rho was used to assess the relationship between critical thinking and clinical judgment. Independent *t*-tests assessed the difference between

groups on clinical judgment. Participants from the intervention groups were individually interviewed following the educational strategy.

CHAPTER IV – PRESENTATION OF FINDINGS

This investigation examined the processes nursing students use to resolve a healthcare situation. More specifically, the processes of critical thinking and clinical judgment were evaluated. Also included in this study was whether grand rounds as an educational strategy enhanced the development of critical thinking and clinical judgment in nursing students. The research questions developed for this study were:

1. How do nursing students use critical thinking skills and clinical judgment to resolve a healthcare dilemma?
2. Does grand rounds as an educational strategy promote development of critical thinking and clinical judgment in nursing students?

In this chapter, the investigation sample is described followed by the findings for each research question.

Participants in the intervention groups completed a semi-structured interview (Appendix E) which provided the data to answer these questions. Interviews were assessed qualitatively through content analysis by identifying patterns, themes, and processes (Merriam, 2009). After the interviews were transcribed, recurring patterns were noted in the margin of the transcript, and sorted into categories. Once recurring patterns were noted, themes or processes were developed that captured the interview content. Clinical judgment data were analyzed using content analysis by the researcher and the Simulation Lab Coordinator using Lasater's Clinical Judgment Rubric (2007b). Participant scores' on the Assessment Technologies Institute Critical Thinking Assessment were evaluated with paired *t*-tests (Polit & Beck,

2004). Spearman's rho was used to analyze the relationship between clinical judgment and critical thinking (Polit & Beck). Participants' scores on the Lasater Clinical Judgment Rubric were assessed with independent *t*-tests. The data were analyzed with the Statistical Package for the Social Sciences (SPSS), version 16.0.

Sample Characteristics

Following a brief presentation of the study, 22 Level II nursing students volunteered to participate in the investigation. Of the volunteers, 19 of the participants were female and three were male. Since the sample size was small, caution should be used to evaluate and interpret the results. Students' ages ranged from 19 years to 50 years (M = 27), for the intervention groups and 20 years to 33 years (M = 24.5) for the comparison group. Students' grade point average (GPA) ranged from 2.50 to 4.00 on a 4.00 scale for the intervention groups and 2.75 to 3.75 for the comparison group.

Findings

Research Question One

The first question stated: How do nursing students use critical thinking skills and clinical judgment to resolve a healthcare dilemma? Participant interviews regarding their thoughts on critical thinking, clinical judgment, and teaching strategies to promote development of those skills were used to answer this question. Also, participant responses in resolving the healthcare dilemma as assessed with the Lasater Clinical Judgment Rubric were assessed with content analysis to determine how the participants resolved the dilemma. Included here is an explanation of the

concept or concepts identified through content analysis followed by excerpts from the participant interviews that support the identified concept.

Participants identified critical thinking as including the habits of mind that direct the individual to think in a different way when faced with a difficult situation. Habits of mind included logical reasoning, deductive reasoning, thinking outside the box, looking at the problem from different angles, and abstract thinking.

> Able to come up with a solution or deductive reasoning, thinking outside the box, it's not black and white, it's not clear cut. You have these symptoms, it could be this, this, or this. A little more research and you're able to narrow down and logically come up with a solution. (Drew)
>
> You have to look at every situation and look at, like one situation there could be hundreds of possibilities. Your job is to narrow it down, and by using critical thinking, you can narrow it down hopefully to the right treatment, diagnosis, whatever. (Skylar)
>
> When you're able to look at something in an abstract way, from all different angles of a problem and you're able to solve it by, I don't know, sometimes you think outside box or take a lot of things into consideration and coming up with a solution to a problem, you don't really think along a line, try and see something from all different angles. (Dallas)
>
> Looking at a situation from multiple, different vantage points and then coming to the best idea or answer that you feel you have by taking in everything that you can, all the information. (Tyler)
>
> Using all of, like looking all of the dimensions of it and then pulling from it different ways to, kind of problem solving, to come up with an answer. But not just using concrete thinking, using abstract thinking. (Stacy)
>
> Being able to think of things from different angles; being able to think outside the box, to think of things in different ways, maybe just than what it appears to be. (Alex)
>
> Being able to think outside the box. Making sure that you can put all the pieces of the puzzle together and connecting the dots, but mostly thinking outside the box. How the person presents may not be what's going on. So

> you have to be able to connect all the dots and focus in on what's important, from their symptoms and stuff. (Jess)

Critical thinking is based in previous life experiences. This includes knowledge gained from the classroom as well as outside activities. Students' experience can be gained in the clinical setting, in simulation, or through work. Many nursing students work in a healthcare environment, but others also work in other service industries.

> Critical thinking, to me, is taking the knowledge you've amassed, in school or from life experiences, and having a problem set in front of you, and then applying that knowledge to that problem. (Chris)

> Being able to think on your feet. Being able to apply the book work we learn in class and make it work for the individual situations that you're put in. Be able to make sound decisions and trust what you're going to do it the right thing to do. (Ellis)

> You would make an educated decision, not just a fly-by-the-seat-of-your pants decision. Hopefully you would be able to think about it and come up with a correct decision based on your experiences and learning. (Taylor)

> The ability to have the knowledge and apply it when it's necessary in the situations you come to. (Sydney)

Critical thinking also means identifying relevant information, examining it within the context of the patient and their condition as well as expected findings, and determining a correct course of action.

> Not everything is clear and finite in nursing, you have to kind of look at a lot of the parameters of what your patient has going on, so this leads to that. It's almost like how we do concept maps. Like you just have to kind of follow what's going on and analyze your patient and then think, ok if this happens then this happens. You almost have to be one step ahead of yourself so that you can anticipate what's coming next. (Pat)

> Being able to differentiate between information relevant to a situation and information that's not relevant and figuring out what's the most important to a particular moment or situation and applying it. (Robin)

> Probably being able to take a bit of information and analyze it, in all different aspects, to think of different scenarios, about what could happen. Like, if you're given this patient and they get this kind of medication, like, anticipating what could happen, you know, different things. (Terry)

> When our patient is in a situation then it's not always going to be a direct answer. Every situation's different. Every patient's different. You just have to think, how am I going to treat this patient versus how you would treat a different patient. (Alex)

Critical thinking allows for identifying relevant information and clinical judgment is then that decision that is made and how the course of action to be taken to handle the situation. A practitioner needs to possess good critical thinking skills to identify the needs of a patient so an appropriate course of action can be initiated.

> The way I see clinical judgment is kind of like seeing the problems in the clinical setting and then making a diagnosis, if you will, of that problem. And then on top of that, judging what to do. I guess just figuring out what to do whenever you're faced with a problem; making a choice, a decision on the best approach to take to the situation. (Chris)

> Assessing the situation and then using your knowledge and previous experience to determine what you need to do. (Jamie)

> Being able to make good decisions based on the circumstances in a situation. You have to have good insight into what to do, how to prioritize things. (Dallas)

> Being able to make decisions based on knowledge that you already have and being able to make the right judgment based on that. (Terry)

> Based on the information given, making a choice regarding the best choice or treatment for the patient. (Drew)

> I think you'd maybe use critical thinking to put together your judgment but I think you do critical thinking without the judgment portion of it. (Tyler)

> Based off assessments and stuff, figuring out what's going on. (Stacy)

> Every sign and symptom you have with a patient, you have to determine if this is a critical thing, if this is something that's going to go away in five minutes and then I don't have to worry about it or is it something that could kill them in ten minutes if I don't pay attention to it. (Robin)

> I think they'd have to have critical thinking to have a clinical judgment because if you don't know how to change and adapt to the situation then your clinical judgment is just going to be the standard that you were taught in school but don't know how to apply it. (Ellis)

> When you're in practice, using good judgment as far as working within an ethical sort of boundary and proper protocols, you know, like hospital regulations. (Jess)

For some students, critical thinking and clinical judgment are inter-related and difficult to distinguish from each other. Both skills relate to patient care, identifying needs, and developing a plan of care.

> Clinical judgment, I think, they parallel each other but they might not be the exact same thing. They overlap in certain areas but I think they differ just slightly in the way that you think. (Pat)

> Kind of the same thing as critical thinking, making the right decisions. Your judgment is based on how you think about each situation, so hopefully if you're a good critical thinker, you'll get to the right point. (Skylar)

> It would be a lot like critical thinking. It's just more in a clinical setting. Sometimes in different situations, things that might be really important may not be very important in another situation and something else if it's an emergency situation. So you just have to use your better judgment to determine if that's really the most important issue at the time or if it's something else that's more important. So if you can't think critically, then your judgment's going to be completely off. You don't have a clue. Conversely, if you're a good critical thinker and think through every situation, then when you get in that clinical situation, you'll be able to better pinpoint that issue's that's pressing. (Robin)

> You have to have good critical thinking to make good precise and accurate clinical judgment. (Terry)

Participants in the intervention groups were more likely to discuss openly the concerns they identified in the healthcare dilemma. They accessed resources more often such as their iPod to assess laboratory values or a medical-surgical textbook to better understand the disease process and what to anticipate. Participants in the intervention groups worked as a group to address the healthcare problems by frequently dividing the tasks in accessing information. This was done as a group process without one person taking responsibility or delegating tasks. Through open dialogue and discussion, participants in the intervention groups would problem-solve bringing into play material learned in class or through experience. Participants would often develop a course of action together before advancing to the next patient state.

This group processing stimulated thinking in other members of the group. Often, it seemed as if what one participant said enabled another participant to recall material from class or their clinical experience that could help clarify or provide more questions to resolve the healthcare dilemma. This helped all group members recognize that they were all part of the team and that it was not just one student in class answering a question. Group processing of the healthcare dilemma also provided an example to participants with lower clinical judgment ability of the type of thinking that is involved or the questions to ask and the information to seek.

Participants in the intervention groups achieved higher scores on the Clinical Judgment Rubric than the comparison group. In the intervention group 33% of the responses were at the *beginning* level compared to 77% for the comparison group.

Clinical Judgment scores' percentages at the *developing* level were higher for the intervention groups, 38%, than the comparison group, 16%. The comparison group had no responses that could be categorized as *accomplished* or *exemplary*. This contrasts with the intervention groups who had 24% responses at the *accomplished* level and 5% of the responses at the *exemplary* level.

A variety of teaching strategies are used at the nursing school that these students attend. Concept maps enable students to realize the connectedness of factors in patient care and to anticipate problems. The concept maps require quite a bit of time for students to construct them. So, even though participants sometimes view the concept maps as time consuming, they eventually came to realize the benefit of completing them.

> At first I thought it was more busy work but as I started doing it, it really does help you to think, not really putting it together but when you're connecting all the lines, it really does get you to think then. (Pat)
>
> It does tie everything together. You know you have to have this leading to this. It helps you think of all those things. (Terry)
>
> On top of that, I think the concept mapping helps out a lot as well because it maps out potential complications and then you have to put in interventions and what you might do in the event that something does happen. (Chris)
>
> Once I get it done, I see it, but pulling it all together, I can see it with the lines and rationales. (Robin)
>
> I really do, especially just for figuring out how it all fits together. You can see how it all fits together. You know, what was wrong with your patient, what was going on, how they're all related. (Dallas)
>
> They gave me a possible cause and effect, show linkages between things which could be helpful. (Drew)

> Yes, you look at your patient from different angles, like what ties to which thing, and how they all relate. (Stacy)

> I could identify what the nursing diagnoses are the problem and then in terms of the interventions and the meds and stuff, it all just kind of flows together. At the end then you've got all of the potential complications or things that could impact the patient. (Kelly)

> They helped you see how things can cause other things and how they all tie together. (Alex)

> I think that they help you connect different areas to other areas; that pain can relate to something else, that risk for infection can relate to pain. They're all intertwined in certain ways. (Jess)

A few students did not feel the concept maps were helpful for developing critical thinking and clinical judgment. This may be reflective of learning style. Some students felt the benefits of concept maps did not continue into the second Level of nursing school.

> I don't think concept maps helped that much, unless you were just breaking it down to see why you had this nursing diagnosis. (Bailey)

> Concept maps helped with labs, but as far as interventions, never really, I guess I just got it and concept maps were just a waste of time. (Jamie)

> I'm not tired of them, it just doesn't really help me that much. Sometimes you anticipate certain things but you can't put a specific name to them but then when you do a concept map you have to have a specific thing. Like the interventions you write down are pretty usually common sense type of things, like not even thinking. They help maybe the first semester but I don't think they've helped this semester that we've done. (Tyler)

Many students did not feel that case studies were beneficial. Reasons cited for this were it did not fit with their learning style, too specific, or were too brief. Nursing students also feel pressed for time with all the demands of their classes. So, if this learning activity was optional, it tended to not be completed.

> Those helped out a bit but it was kind of hard because they were so fast-paced that it was hard to really focus on it and then there was so much other stuff going on, you know. (Chris)

> Just because it basically was outlining what we learned in class already, like the signs and symptoms, so a lot of case studies were just straight out like, ok this person has this signs and symptoms, this, this, and this, and I had already learned that. So to me it didn't really help too much. (Tyler)

> I think there's just so much in nursing school, you just want to get the bases of stuff. It feels like we just have enough time to learn the material and all those other things probably would help but we don't have time for it. When we actually sit down and do that stuff it helps. (Skylar)

> Sometimes [helpful]. I don't do a lot of them because I'm not a writer so I'd much rather discuss it than have to write it down and turn it in. I don't do as well with writing. (Ellis)

Participants who thought case studies were beneficial related that it provided an opportunity to apply information learned in class. Students who felt they were helpful typically limited their benefits. Case studies were not as valuable as other learning strategies.

> Yea, I think for me, most case studies required research. You know if I had a case study, I'd go back and try and come up with something, read about symptoms or come up with a best course of action on research. It usually wasn't cut and dried, you'd have to use some of that deductive reasoning based on what the question was. (Drew)

> You kind of go through the motions without the patient involved. It can give you more difficult situations than you do in clinical, more than what you'd feel comfortable with, and do stuff and learn. (Alex)

> Those were helpful just because you could read it all out. It's harder for me to learn that way when it's on paper and it's not the patient sitting in front of you, cause I infer more just being in a room and if a person says it to me rather than reading it. (Pat)

> I love case studies. That's how I learn. (Jamie)

> Yes, I like them, just not as much as concept maps and being there. I find it harder on a piece of paper than, you know, hands on. Usually case studies are looking at one specific thing than a broad thing. (Terry)

> Because you can sit down and discuss it and look at every little detail and part of a situation, I think that does help. (Robin)

> I do think that they're helpful, but personally I would rather learn hands-on. (Kelly)

Reflective journaling is not utilized in many classes. This lack of exposure and experience with journaling may affect how this activity is perceived by students. For students who also journal in their daily life, this reflective activity helped them process and learn from the experience.

> I think that journaling is helpful for just kind of reflecting on maybe different things that you might had done throughout the day. (Chris)

> For me it is because I love to write and I journal things throughout life anyways cause it just helps give it a clearer perspective on it. I think after you experience something and you go back and you have to reexperience it again to journal about it. It's like getting a second look at it and you kind of sometimes think you know this occurs to you after the fact but you know next time I'm going to do this or if this happens again now I know what I want to do. (Pat)

Students recognized great value in the questioning from their instructors. In a way, this activity gave them some structured experience in critical thinking. The instructor was able to ask about the relevance of a lab result or the connectedness of the patient's condition with medications and lab that helped students put the information together in a meaningful way.

> Yes, you do your research the night before clinicals, you know you look all that stuff up, then you retain it and they ask about it; you go in and they question you about it, maybe you overlooked something and your clinical instructor, you know, you can look at that. And you're like, oh, yea. (Terry)

It just gets you thinking about, not only have a little knowledge base to it, but potential things you could come across and what potential outcomes could be. It just gets you thinking and that all impacts and affects your interaction with the patient and you just want to always feel the best prepared as you can be. (Kelly)

Postclinical, like in postclinical you discuss. For me, I think to talk about it and then to go do it, I think that helps me a lot. (Robin)

Yea, because it makes you think back and figure out what you've been taught, maybe a specific medication or procedure and kind of think through it. So it kind of helps you think, because not everything's the same procedure-wise or medication. (Drew)

A lot of it gets you ready for clinical, especially the first day when you're not sure what to expect, give you a heads-up; kind of a pregame talk. Postclinical is good if they see something you could be doing or even if you did something well, they'll talk about it. (Sydney)

I think it does help because you have an idea what you're looking for, for side effects, if you're giving somebody a diuretic and their blood pressure bottoms out and it's been like 30 minutes since you gave it, you'd be looking for symptoms, signs. I think it's important for critical thinking for a dressing change or whatever, to review it before you do it. (Jess)

I think with the meds, definitely. Because sometimes meds have drug-drug interactions or you can't give it if, you can't give high blood pressure medication if their blood pressure is too high, or too low; stuff like that. The meds especially, because you don't always think about all that stuff. It's your natural reaction to just give it and you need to learn that you can't just do that. (Alex)

Yea, I mean even when you have lab values that don't make sense or you don't see how they could be off and then you talk to your instructor and then you kind of, make you think about it more in a different way. (Dallas)

Yes, the pre and also the post [clinical] because you learn a lot from those also. You know, the post, you kind of bring everything in from the day. (Corey)

I really think when we look at lab values for our concept maps and putting stuff together, one of the things they ask is 'why is this lab off'. So your iPod

> will give you a list of things that could be wrong but you kind of have to apply it to your patient and what would pertinent. There's just a lot of things I think with that questioning and they're always, ok well what's next, what if this happened. Even if it wasn't something necessarily occurring, just a lot of prompting to get you to think. (Pat)

> I think by making us talk through our situations and by making sure we know before we go in what's going then we can start to make judgments on what we're going to have to do during the day. (Ellis)

Simulation appeared to help students feel comfortable in the clinical setting but did not necessarily assist in the development of critical thinking and clinical judgment.

> Especially before that very first clinical, you don't feel quite as uncomfortable with everything. (Alex)

> I think those just help, those experiences just help you feel that you could handle those things that come up in clinical and look at all the little details that are essential to care. (Kelly)

> Yea, I think it's really helpful especially in first level, you had a chance to be around a patient without being around a patient. I know the first time we left, we thought it was a helpful experience, just because you got to do a lot of things. (Drew)

> I like simulation because, this semester mainly because it happened at the very beginning of the semester for me, and after having a break from first semester and clinicals, I found that it was a great way to jump back into the clinical nursing setting. (Chris)

> I think it's most helpful in the first semester because you really don't know what you're getting into and it really kind of helps you before. Like I had it before I went into any clinical so it really helped kind of set a foundation what you're really going to see and anticipate 'cause I don't think people know what to expect. So it helps you put things together and then when you sit down and talk about it afterwards it helps draw lines. (Pat)

> Simulation lab was great. Because we did the parts, but I just didn't feel comfortable with it. I don't feel comfortable knowing what to do. I'm used to having someone telling me what to do, not figure it out on my own. (Corey)

> The second time going in this semester I was a little more prepared what to expect and that helped and I also feel that we also did the discussions in our groups that didn't apply to the Meti-man, like, how to think while you're in the Meti-man and what to look for and just pulling out the clinical experience from last semester. I was thinking, hey, I kind of understand this now or I know how to chart this now. (Robin)

Simulation enhanced learning by meeting students' learning style. The realistic and interactive environment provided a forum where students could learn by doing and discuss the situation with their peers and instructor.

> It's a little bit different as far as, when you're on the floor and you actually have a real patient, sometimes you're a little bit more, you're a little bit more nervous that something would go wrong. I think with Meti man or like what we did here was more, you're with different people and you're able to discuss it with your peers and it kind of opens things up and you kind of feed off each other. Yea, like even when we're on the floor, to talk about our patients, what's going on, feed off each other, talk with our instructor. (Dallas)

> To get to have that and then go on the floor. I think you learn a lot. At least that's how I learn, doing rather than watching. (Taylor)

> I do better with hands-on learning, I don't do much by reading something, I don't really grasp it that much. I'm more of just listening to somebody say something or seeing it first-hand. (Tyler)

> One thing about that, afterwards we go and talk about everything and things like that help your critical thinking. (Stacy)

> I think it helps make things stick and you have time to make them stick and figure out how to make it better next time. (Ellis)

> Yea, I think so because you have to think, the night before you have to look over and have to know what's expected; like how to give the med; like the chest tube we had to know what we were looking for. (Bailey)

> Meti-man is good because you're dealing with a patient who's talking to you and you've got to interact and in lab it's not so much. (Jess)

Students volunteered that clinical experiences provided an optimal experience for learning. Clinical provided opportunities to apply knowledge gained in the classroom. Also, clinical instructors acted as a valuable resource to address their concerns. Many students related that they learn best in a hands-on environment. So clinical provided a valuable forum for them that was preferred over lecture.

> It's one thing to do it on paper when we get prepped for it but to go out and do our clinical. You know you have certain cases and when you're kind of in the act of like, well your client's pulse ox is dropping, you have to make an immediate action with your proctor normally or whoever's there with you. In that experience you remember, 'cause you almost had this anxious moment of like, oh my gosh this is actually happening. Everything I've experienced has added to my knowledge. (Pat)

> The first time you take care of a patient, how do you do things, how do be observant, communicate. (Alex)

> The clinical is by far the best learning experience. You're able to talk with your instructor and ask questions. (Skylar)

> Clinical helps with that too, helping you apply what you learn in the classroom, like actually doing it to a patient. (Stacy)

> Being on the floor, the foundations of your learning, apply that to a situation, better than on a piece of paper. (Taylor)

An unexpected learning activity for development of critical thinking and clinical judgment were tests. Nursing educators often write questions reflective of the style of questions that graduates will find on NCLEX, the licensing examination. Even though these questions are often in a multiple-choice format, students still need to possess a good understanding of the concepts and apply them to novel situations. Also, this nursing school uses Assessment Technologies Institute (ATI) materials to assess and monitor student learning throughout the nursing program.

> As far as the test questions, there's more than one right answer. So you have to pick the best answer and you've got to do that based on your experience and what you've been taught. (Drew)

> I remember with the test questions at the beginning of school when we looked at some sample ATI questions and I remember thinking I could look at all four options and could rationalize each of the four and I remember that being really frustrating and scary that I couldn't decipher that difference and at the beginning of the semester I had an aha moment. I just had one this semester, where, wow, it's evolving, thank you, it's changing. (Kelly)

> Our exams, it's rarely just one answer. There's always like the best answer. (Alex)

> But also, like in general, the ATI NCLEX style questions on tests, just seeing those over and over and sit there, alright, are they breathing, do they need oxygen. Being able to start thinking, you know, like Maslow's, and you know, going through multiple choice questions like that, you know, they are bleeding profusely and that's the next most important thing and I guess just doing that over and over again really helps. (Robin)

> How to look at a question differently because everyone can perceive a question differently. Going over all the different ways, the critical thinking part of it. (Skylar)

> I think in class the test and the different things that we do help foster our thinking. (Ellis)

To summarize, participants recognized the importance of critical thinking and clinical judgment in the healthcare setting. This includes abstract thinking, thinking outside the box, inductive and deductive reasoning. Critical thinking and clinical judgment can be difficult to distinguish from each other as both are involved in determining patient needs and developing a plan of care. Participants in the intervention groups processed the healthcare dilemma in more depth than the comparison group by accessing resources, discussion, and group processing. Participants discussed teaching strategies used at this school of nursing. While the

majority of strategies appear to promote development of critical thinking and clinical judgment, students relate that they prefer more active learning styles rather than passive instruction such as lecture. The hands-on activities or those that require working with others are better at reinforcing learning.

Research Question Two

The second question stated: Does grand rounds as an educational strategy promote development of critical thinking and clinical judgment in nursing students? Participants' scores on the ATI CTA at the conclusion of the study were compared between groups to assess differences between the groups. Participants' scores on the Assessment Technologies Institute (ATI) Critical Thinking Assessment (CTA) at the first week of nursing school and at the conclusion of the study were compared for growth. The relationship between critical thinking and clinical judgment scores was assessed. Finally, participants' scores on the Clinical Judgment Rubric were assessed to compare differences between groups. Participant interviews regarding their thoughts on grand rounds as an educational strategy to promote development of those skills were used to answer this question. Included here is an explanation of the concept or concepts identified through content analysis followed by excerpts from the participant interviews that support the identified concept.

Summaries of the data are presented in Tables 1 and 2. Participants completed the Assessment Technologies Institute Critical Thinking Assessment the first week of nursing school (CTA-1) and at the conclusion of the study (CTA-2). Included in the tables are participant CTA-1 composite scores national percentile

Table 1

Critical Thinking Assessment (CTA) and Clinical Judgment Scores: Intervention Groups

CTA-1	%ile	CTA-2	Difference	Clinical Judgment
75.0	76	65.0	-10.0	45
72.5	67	82.5	10.0	18
75.0	76	75.0	0.0	39
87.5	99	87.5	0.0	50
77.5	84	75.0	-2.5	34
77.5	84	80.0	2.5	44
62.5	33	75.0	12.5	18
82.5	94	67.5	-15.0	42
77.5	84	75.0	-2.5	22
82.5	94	77.5	-5.0	32
67.5	49	80.0	12.5	72
82.5	94	80.0	-2.5	38
80.0	90	87.5	7.5	54
80.0	90	82.5	2.5	52
75.0	76	65.0	-10.0	18
70.0	58	72.5	2.5	20
75.0	76	70.0	-5.0	22
85.0	97	87.5	2.5	34

Note. CTA-1 = Critical Thinking Assessment, first administration. %ile = national percentile rank of CTA-1. CTA-2 = Critical Thinking Assessment. Difference = Difference in scores between CTA-1 and CTA-2. Clinical Judgment = Participants' scores as assessed with Lasater Clinical Judgment Rubric.

Table 2

Critical Thinking Assessment (CTA) and Clinical Judgment Scores: Comparison Group

CTA-1	%ile	CTA-2	Difference	Clinical Judgment
67.5	49	82.5	15.0	22
87.5	99	72.5	-15.0	18
70.0	58	72.5	2.5	18
75.0	76	60.0	-15.0	30

Note. CTA-1 = Critical Thinking Assessment, first administration. %ile = national percentile rank of CTA-1. CTA-2 = Critical Thinking Assessment. Difference = Difference in scores between CTA-1 and CTA-2. Clinical Judgment = Participants' scores as assessed with Lasater Clinical Judgment Rubric.

ranking. Participants' scores on the Assessment Technologies Institute Critical Thinking Assessment at the conclusion of the study (CTA-2) were compared with their Critical Thinking Assessment (CTA-1) scores obtained during the first week of nursing school and evaluated with paired *t*-tests to measure significance of change. There was no significant difference between groups between the first CTA (CTA-1)

and the second CTA (CTA-2), $t = .285$, $p = .794$. While some students' scores in the intervention groups revealed no change or an increase, 44% of students' scores decreased. The mean of the differences in the intervention groups' scores between CTA-1 and CTA-2 is 0 (see Table 1). In the comparison group, students' scores indicate a decrease in critical thinking ability as assessed with the Critical Thinking Assessment. The mean of the differences in the comparison group's scores between CTA-1 and CTA-2 is -3.125 (see Table 2). In other words, students who received the educational strategy exhibited less decline in critical thinking than students in the comparison group, although this change was not significant.

Participants' scores on the CTA (CTA-1) during the first week of nursing school were higher in the intervention groups ($M = 76.95$, $SD = 6.28$) than the comparison group ($M = 75$, $SD = 8.90$). Participants' scores on the CTA (CTA-2) at the conclusion of the study were higher for the intervention groups ($M = 76.95$, $SD = 7.20$) than the comparison group ($M = 71.88$, $SD = 9.21$). An independent *t*-test was used to assess the difference between groups on the Critical Thinking Assessment when administered in the first week of nursing school and at the conclusion of the study. There was no significant difference between Critical Thinking Assessment scores for the first administration, $t\ (df = 20) = 5.22$, $p = .607$, or the second administration, $t\ (df = 20) = 1.217$, $p = .238$. However, even though the difference was not significant, the scores for the second session indicated greater gains in critical thinking skills for the intervention groups.

An ordinal scale was applied to Lasater's Clinical Judgment Rubric (Lasater, 2007b). Scores on the Rubric for the intervention groups (M = 36.33, SD = 15.16) are higher than scores for the comparison group (M = 22, SD = 5.66). A Spearman's rho correlation was used to evaluate the relationship between clinical judgment and critical thinking. There is no significant relationship between clinical judgment and critical thinking for the intervention groups indicating these may be independent skills, $\rho = .163$, $p = .518$. There is no significant relationship between clinical judgment and critical thinking for the comparison group, $\rho = -.282$, $p = .718$. However, there is a slight positive relationship for the intervention groups while there is a negative relationship for the comparison group. In other words, as critical thinking ability increased, so did clinical judgment for the intervention groups. In contrast, as critical thinking ability increased, clinical judgment decreased for the comparison group. Neither one of these relationships was significant.

An independent t-test evaluated the difference in clinical judgment scores. A significant difference was found between the intervention groups' clinical judgment scores and the comparison group's clinical judgment scores, t (df = 20) = 1.833, $p = .082$. Students were enthusiastic regarding the grand rounds strategy. Being able to work as a group and learning from each other while working through a realistic patient situation were cited as benefits of grand rounds. Participants appreciated the changes in patient status that provided for a realistic setting. In nursing, it is important for practitioners to feel comfortable to reflect on their practice with other

nurses. Participants were typically much more verbal in relating their appreciation of grand rounds than other strategies.

> For me, it's harder to read and think about it so it was helpful because the group part of it was helpful for me, to kind of bounce off my peers. (Pat)
>
> Like using, it was really good to see a set of assessments and then decide what's going on and then what else you would want to know. And then getting the next set of assessments and they're changing, figuring out why they're changing. So I think that really helped putting a real situation together. (Stacy)
>
> Yes, I wish I could work with four people or five people all the time, because I think some people pick up on certain aspects that other people may not pick up on. So it's awesome when you can get together and seem to play off each other like that and realize that you can draw up different conclusions. You don't have to come up with all of it on your own. (Taylor)
>
> I wish we did more of those situations, because you have to think about it, what's the diagnosis, what have you given, you know, what are you looking for. I think it just re-iterates what you should be doing. It helps support what you should be doing. (Jess)
>
> The main thing was to learn from each other and work together as a group. I think in nursing you are independent but you work as a team. So you learn to work together. (Terry)
>
> When you're in a group and you go over something, I think it helps because you learn from each other. (Corey)
>
> With the group, they think of things you don't think of, or see what you don't see or see it differently. So it's nice to hear everybody's input. (Alex)

Students relate that having peers providing explanations was valuable as the peer often understands where the student is struggling to understand a concept. Since all students bring a different background to a situation, they are able to help each other, to learn from each other. Learning to listen to other students' critical thinking and clinical judgment in process, helps develop those skills in students.

> Cause even if they don't necessarily know the answer they might say something that kind of like would spark something that I was thinking so it helps me keep progressing towards an outcome or a solution. (Pat)
>
> Everybody brings different backgrounds and strengths to the group and so we all learn from each other. (Kelly)
>
> Yes, you can feed off your peers, you know, and get their insight to things you hadn't thought of. You know, that makes sense, you know, maybe something you hadn't thought of, somebody else gave a little extra knowledge. (Terry)
>
> I really think it's helpful to do that and to work in groups because in a clinical setting, you're not the only nurse there, you're not the only person in the situation so it helps make sure you're listening to other people's thoughts to come up with the best options for your patient. (Ellis)
>
> While this is more of a learning experience because you are processing what you're talking about; you're red-flagging what is important. It made me more aware of the clinical judgment part of it, what really is important, what to look for, and also to use your peers. The instructors are great but your peers understand it at your level. So sometimes it easier for them to explain it to you because they understand it in terms you know. Sometimes someone will remember this from one class and someone else remembers this from another class and you're like, oh, that's what's going on. And you didn't remember that other part. So it's really hard, like, I'm missing something, they can fill that blank in. (Robin)

Advantages of grand rounds as recalled by participants were the discussion with classmates and instructor, group processing, and the small group size. In a small group, students who are less likely to speak in a regular class, now feel comfortable to express themselves. During one session, one student remarked to another student, "Wow, I've never heard you talk so much before. Keep going!" Participants in the intervention groups accessed reference materials more frequently and talked more among themselves than did the control group.

> I like groups especially when it comes to things like that because it really stimulates how we would work if we had a setting like that and somebody had a question about what was going on with their patient. (Ellis)

> Being able to talk amongst yourselves in a group setting, smaller groups, kind of helped us all open up more. (Dallas)

> The small group stuff I think is a lot better, and situations that change over time, that's really helped out a lot. (Skylar)

> I mean the simulation is good, but your giving us the information and talking about it for the things and the time frames type of situation. It helps a lot. It was helpful to talk about it because I remembered that a lot better than just from class. (Sydney)

Limitations of grand rounds were reflective of working in groups. These included that one member of the group might dominate the discussion or the group progressed faster than the participant was able to follow. Every student brings a different knowledge base to the situation. Those who are more experienced will process information quicker which can hinder the developing practitioner to arrive at the same conclusions.

> Sometimes others would pick it up quickly and then there's the rest of us that it takes awhile longer. When somebody throws the answer right out and you don't have time to think about it. Sometimes you didn't get a chance to think it through yourself. (Alex)

> Asking individuals what they thought because sometimes, like one person might know what was going on, but the other person talks more. (Stacy)

> When we had a session and somebody did most of it really quick, then it takes away from you trying to figure out. So you didn't always have time to process. (Corey)

> I could see where some people are a little more quiet in groups and some people have more extensive experience. So sometimes there might be personalities that are more dominant in the situation and other people might

> feel that they don't have an opening and get in there or they just naturally hold back. (Kelly)

To summarize, there was no significant relationship between critical thinking and clinical judgment scores. There was no significant difference between groups between the first administration of the Assessment Technologies Institute Critical Thinking Assessment during the first week of nursing school and at the conclusion of this investigation. There was no significant difference between groups between Critical Thinking scores at the conclusion of the study. There was a significant difference between groups on the clinical judgment scores, t (df = 20) = 1.833, p = .082. Qualitative analysis revealed participants valued the grand rounds teaching strategy for developing critical thinking and clinical judgment skills. Participants cited the small group size, discussion with peers and instructor, and learning from each other as benefits.

Summary

The purpose of this investigation was to evaluate the effectiveness of grand rounds as an educational strategy in development of critical thinking and clinical judgment skills in baccalaureate nursing students. The first research question stated: How do nursing students use critical thinking skills and clinical judgment to resolve a healthcare dilemma? Participants identified abstract thinking, inductive and deductive reasoning, and thinking outside the box as characteristics of critical thinking. Participants in the intervention groups processed the healthcare dilemma in more depth than the comparison group by accessing resources, discussion, and group

processing. While the majority of strategies appear to promote development of critical thinking and clinical judgment, students relate that they prefer more active educational practices rather than passive instruction such as lecture that reflected their learning style. The hands-on activities or those that require working with others are better at reinforcing learning.

The second research question stated: Does grand rounds as an educational strategy promote development of critical thinking and clinical judgment in nursing students? The results of the data analysis indicated there was no significant difference between groups between the first CTA (CTA-1) and the second CTA (CTA-2), $t = .285$, $p = .794$. There was no significant difference between Critical Thinking Assessment scores for the first administration, $t = 5.22$, $p = .607$, or the second administration, $t = 1.217$, $p = .238$. The results of the data analysis indicated there was no significant relationship between clinical judgment and critical thinking skills for the intervention groups, $\rho = .163$, $p = .518$, or the comparison group, $\rho = -.282$, $p = .718$. There was a significant difference in clinical judgment scores following the intervention, $p < .10$. However, given the small sample size, caution should be used when evaluating and interpreting the results. Qualitative analysis revealed participants valued the group processing, small group size, and discussion aspects of grand rounds in resolving a healthcare dilemma.

CHAPTER V – DISCUSSION

A discussion of the investigation is presented in this chapter. Following a summary of the investigation, the study results will be presented accompanied by current research on the topic. The chapter will conclude with a presentation of the limitations of the study and recommendations for further research.

Summary of the Investigation

The purpose of this investigation was to examine the effectiveness of grand rounds as an educational strategy to develop critical thinking and clinical judgment skills in baccalaureate nursing students using Lasater's Clinical Judgment Rubric. Tanner's theory of clinical judgment provided a theoretical foundation for the investigation. The theoretical framework also included Dewey's theory of reflective and cooperative learning as well as the importance of the natural environment in learning, constructivist learning theory, and Neuman's systems-based nursing theory. A quasi-experimental, pre-, post-test research design was employed with this study. The sample consisted of 22 Level II baccalaureate nursing students from a Midwest baccalaureate school of nursing.

Paired *t*-tests were used to assess the differences between participants' scores on the Assessment Technologies Institute's Critical Thinking Assessment at entrance to the nursing program and at the conclusion of the investigation to assess growth of those skills. Independent *t*-test evaluated the difference between groups on the second administration of the Critical Thinking Assessment. Spearman's rho correlational statistic was used to evaluate the relationship of clinical judgment to

critical thinking. Independent *t*-test assessed the differences between the intervention groups' and comparison group's clinical judgment scores. Content analysis of participant interviews and group sessions where students resolved a healthcare dilemma assessed the processes of critical thinking and clinical judgment that students employed. Participants also reflected on teaching strategies used at this school of nursing.

Interpretation of Findings and Conclusions

Research Question One. The first question asked: How do nursing students use critical thinking skills and clinical judgment to resolve a healthcare dilemma? Qualitative analysis revealed that participants identified various habits of mind that are utilized when resolving a healthcare dilemma. These included logical reasoning, deductive reasoning, thinking outside the box, looking at the problem from different angles, and abstract thinking.

> When you're able to look at something in an abstract way, from all different angles of a problem and you're able to solve it by, I don't know, sometimes you think outside box or take a lot of things into consideration and coming up with a solution to a problem, you don't really think along a line, try and see something from all different angles. (Dallas)

> Using all of, like looking all of the dimensions of it and then pulling from it different ways to, kind of problem solving, to come up with an answer. (Stacy)

> Being able to think of things from different angles; being able to think outside the box. (Alex)

These were similar to the habits of mind and skills identified by Scheffer and Rubenfeld (2000) which include: creativity, flexibility, analyzing, and logical

reasoning. Being able to apply logic to case studies was identified also by Ellermann, Kataoka-Yahiro, and Wong (2006) as indicative of emergent critical thinking ability. Tanner (2006) has also identified that nurses use a multiple number of reasoning patterns in their clinical judgment. Tanner uses the terms clinical judgment and critical thinking interchangeably. Some participants also echoed Tanner's assertion that critical thinking and clinical judgment were closely related, if not the same concept.

> Clinical judgment, I think, they parallel each other but they might not be the exact same thing. They overlap in certain areas but I think they differ just slightly in the way that you think. (Pat)

> Kind of the same thing as critical thinking, making the right decisions. Your judgment is based on how you think about each situation, so hopefully if you're a good critical thinker, you'll get to the right point. (Skylar)

Participants also identified the importance of life experiences in critical thinking. Classroom activities as well as outside activities aided in the development of knowledge that enhanced critical thinking ability.

> Critical thinking, to me, is taking the knowledge you've amassed, in school or from life experiences, and having a problem set in front of you, and then applying that knowledge to that problem. (Chris)

> Being able to apply the book work we learn in class and make it work for the individual situations that you're put in. (Ellis)

This correlates with Tanner's (2006) assertion that critical thinking ability is impacted by what a nurse brings to the situation. This includes previous experience with this particular patient and patients with similar conditions.

Critical thinking also means identifying relevant information, examining it within the context of the patient and their condition as well as expected findings, and determining a correct course of action.

> All the time, when you're with your patients and just in their assessments, you would want to know what their medications are, what to look for, what their side effects are, so you can just be present all the time or have an idea what you need to look for in the future, be prepared. (Taylor)

> Being able to differentiate between information relevant to a situation and information that's not relevant and figuring out what's the most important to a particular moment or situation and applying it. (Robin)

Beckie, Lowry and Burnett (2001) related that the content for successful nursing practice was too extensive for students to learn everything. Instead, nursing education should focus on developing graduates who are good critical thinkers. Being able to engage in a novel situation and critically evaluate it, is invaluable to professional nurses.

Participants identified clinical judgment as the application of good decisions in a healthcare setting. Critical thinking is essential to adequate clinical judgment. Nurses need to identify relevant from non-relevant information. Critical thinking allows for identifying that significant information and clinical judgment is then applying a decision based on the conclusions that result from critical thinking.

> Being able to make decisions based on knowledge that you already have and being able to make the right judgment based on that. (Terry)

> I think you'd maybe use critical thinking to put together your judgment but I think you do critical thinking without the judgment portion of it. (Tyler)

Participants in the intervention groups achieved higher scores on the Clinical Judgment Rubric than the comparison group. In the intervention group 33% of the responses were at the *beginning* level compared to 77% for the comparison group. Clinical Judgment scores' percentages at the *developing* level were higher for the intervention groups, 38%, than the comparison group, 16%. The comparison group had no responses that could be categorized as *accomplished* or *exemplary*. This contrasts with the intervention groups who had 24% responses at the *accomplished* level and 5% of the responses at the *exemplary* level. Making appropriate choices and decisions in the healthcare field is referred to as "thinking like a nurse" (Tanner, 2006). Students often do not have the opportunity to practice these decision-making skills except in the clinical environment. Simulation has provided another environment where students can practice these skills. Lasater (2007b) developed the Clinical Judgment Rubric that has been used to assess student performance in clinical judgment as well as for students to evaluate their own performance. Participants in the intervention groups processed the healthcare dilemma in more depth than the comparison group by accessing resources, discussion, and group processing.

The effect of teaching strategies used by this nursing school for critical thinking and clinical judgment skill development were evaluated by participants. Some participants relate that concept maps help them recognize the relatedness of patient variables including physiological and psychological areas. The concept maps do require a great time investment of the student which seems to affect the student's

acceptance of them as a valuable learning tool. Scheffer and Rubenfeld (2000) identified cognitive skills as essential to critical thinking skills. These cognitive skills were also identified by Abel and Freeze (2006) in their study of the use of concept maps with nursing students. Abel and Freeze as well as Ellermann, Kataoka-Yahiro, and Wong (2006) and Vacek (2009) concluded that students become more abstract in their thinking as they develop as critical thinkers and are better able to identify the connections that impact patient care.

Participants related that case studies are a good way to apply information learned in class. However, most students prefer other learning strategies over case study. Case studies have been shown to increase critical thinking skills by applying knowledge (Cruz, Pimenta, & Lunney, 2009; Hoffman, 2008). A patient situation is rarely simple and case studies can be structured to reflect that complexity. However, the case studies that participants were familiar tended to be more focused and another way of presenting material from lecture. Even though this strategy was helpful, some students related that it did not fit with their learning style.

Dewey (1948) was the first to promote reflection on learning as a method to enhance learning. Tanner (2006) also has advocated for reflection on practice as a way to develop clinical judgment. Reflective writing is not utilized very much at this school. Therefore, participants' exposure to this technique is limited. Students who related it as beneficial to developing critical thinking and clinical judgment were typically students who also journal in their personal life. Reflective journaling has been shown to be most effective when structure or prompts are included in the

writing technique (Hoffman, 2008; Jones, 2008; Lasater & Nielsen, 2009). It may be that the strategy has not been implemented correctly or that students do not have adequate experience with the strategy to appreciate or recognize the benefits.

Critical thinking has been shown to improve with effective questioning strategies (Sellappah, Hussey, Blackmore, & McMurray, 1999; Sorensen & Yankech, 2008). Participants related that they do appreciate the questioning from their instructors, especially in the clinical setting. This interactive process helps students recognize connections or to anticipate a patient condition or outcome. However, it is important for optimal student outcome, that the questions reflect a higher cognitive level and not just a recall of content (Hoffman, 2008).

Simulation provides a realistic environment for students to provide care to a patient. Anderson and Tredway (2009) have asserted that critical thinking is developed by practice. Simulation allows for changing patient conditions that are in response to the decisions implemented by students. Simulation also provides an opportunity for students to practice assessment and other psychomotor skills which has enhanced confidence (Horan, 2009; Ravert 2008). Simulation allows for students to be active participants in their learning which is essential in constructivism learning (Rothgeb, 2008). Participants, however, related that simulation helped them prepare for the clinical setting but did not feel it enhanced their critical thinking or clinical judgment. Students shared that simulation met their learning style. They appreciated being able to practice skills and discuss events with their peers and instructor. Clinical experiences were noted by participants also as an optimal

learning environment due to its hands-on nature. It is a precarious relationship in that students need to have a level of education and preparation before entering the clinical environment. Not all learning can occur in the clinical setting as students require a knowledge base to provide safe care, but at the same time, learning is reinforced in the clinical setting.

Research Question Two. The second question asked: Does grand rounds as an educational strategy promote development of critical thinking and clinical judgment in nursing students? A paired *t*-test assessed the difference between groups on the Critical Thinking Assessment score. There is no significant difference between Critical Thinking Assessment scores at the beginning of nursing school compared with scores at the conclusion of the study, $t = .285$, $p = .794$. An independent *t*-test was used to assess the difference between groups on the Critical Thinking Assessment when administered in the first week of nursing school and at the conclusion of the study. There was no significant difference between Critical Thinking Assessment scores for the first session, $t = 5.22$, $p = .607$, or the second session, $t = 1.217$, $p = .238$. However, even though the difference was not significant, the scores for the second session indicated greater gains in critical thinking skills for the intervention groups. A Spearman's rho correlation was used to evaluate the relationship between clinical judgment and critical thinking. Results indicate no significant relationship between clinical judgment and critical thinking for the intervention groups, $\rho = .163$, $p = .518$, or the comparison group, $\rho = -.282$, $p = .718$. However, there is a slight positive relationship for the intervention groups

while there is a negative relationship for the comparison group. Scores on the Clinical Judgment Rubric for the intervention groups, $M = 36.33$, $SD = 15.16$, are higher than scores for the comparison group, $M = 22$, $SD = 5.66$. An independent *t*-test evaluated the difference in clinical judgment scores. A significant difference was found between the intervention groups' clinical judgment scores and the comparison group's clinical judgment scores, $t = 1.833$, $p < .082$.

The critical thinking results obtained are reflective of Critical Thinking Assessment scores for all students at this school when evaluated at the beginning of the nursing program and at the end of the program. Critical Thinking Assessment scores for the past four graduating classes from this nursing program are:

Fall 2008: entrance 50, exit 90

Spring 2009: entrance 86, exit 86

Fall 2009: entrance 68, exit 55

Spring 2010: entrance 57, exit 67

While some classes demonstrated growth, other classes exhibited no growth or a decrease in scores. However, in this investigation, participants who received the educational strategy exhibited more growth, but this change was not significant. It is possible the Assessment Technologies Institute Critical Thinking Assessment is not a good assessment tool for critical thinking skills of nursing students. The Critical Thinking Assessment was selected for this study as it was developed along the lines of the clinical reasoning process that practicing nurses use in their practice. This is an improvement from the California Critical Thinking Skills Test, California Critical

Thinking Disposition Inventory, and the Watson-Glaser Critical Thinking Appraisal as these instruments were developed for the general public. Adams (1999) speculated that nursing students were developing adequate critical thinking skills, but an adequate assessment instrument for nursing students was not available. Another possible explanation is that not enough time had lapsed between administrations of the Critical Thinking Assessment to evidence changes in critical thinking ability.

Although there is no significant relationship between clinical judgment and critical thinking for both the intervention and comparison groups, there is a slight positive relationship for the intervention groups while there is a slight negative relationship for the comparison groups. Tanner (2006) has concluded that clinical judgment relies, in part, on the context of the situation, the culture of the nursing unit, knowing the patient and their typical responses, and the interaction with the patient. Since these variables were not included in the instructional strategy, participants' responses may have been more negatively impacted than if they were actively practicing in a nursing role.

Participants appreciated the instructional strategy utilized in this study. Many commented on being able to work in a small group which enabled them to learn from each other. The status changes of the fictitious patient provided a realistic setting.

> The small group stuff I think is a lot better, and situations that change over time, that's really helped out a lot. (Skylar)

> The main thing was to learn from each other and work together as a group. I think in nursing you are independent but you work as a team. So you learn to work together. (Terry)

> With the group, they think of things you don't think of, or see what you don't see or see it differently. (Alex)

> Everybody brings different backgrounds and strengths to the group and so we all learn from each other. (Kelly)

Research by Lasater (2007a) revealed that students liked working in a group in simulation as this allowed them to hear other students' ideas. This resulted in more flexibility in their thinking as well as learning from others' experiences. Considering other possibilities in the problem-solving process is a hallmark of critical thinking (Walsh & Seldomridge, 2006). Providing alternative environments to the clinical setting to practice and develop critical thinking and clinical judgment are needed in nursing education.

Participants related that they were able to learn from their peers, since the peers are more at their learning level than the instructor. Having other participants explain how their own critical thinking and clinical judgment are at work in a scenario, helped refine the process for other students.

> ….then having my peers there. Cause even if they don't necessarily know the answer they might say something that kind of like would spark something that I was thinking. (Pat)

> I really think it's helpful to do that and to work in groups because in a clinical setting, you're not the only nurse there, you're not the only person in the situation. So it helps make sure you're listening to other people's thoughts to come up with the best options for your patient. (Ellis)

> While this is more of a learning experience because you are processing what you're talking about….The instructors are great but your peers understand it at your level. So sometimes it easier for them to explain it to you because they understand it in terms you know. (Robin)

Cooperative learning is often preferred by students. This collaborative learning method often stimulates ideas and provides support during the learning process (Lasater, 2007a). Peers can often provide an alternate explanation that is more meaningful to students than faculty's explanation as evidenced by peer tutors. Having faculty present to clarify meaning and ensure correct learning is an added benefit. Faculty can also be present to provide an example of how thinking like a nurse would look (Walsh & Seldomridge, 2006).

Participants cited as benefits of grand rounds were the discussion with classmates and instructor, group processing, and the small group size.

> I like groups especially when it comes to things like that because it really stimulates how we would work if we had a setting like that and somebody had a question about what was going on with their patient. (Ellis)

> Being able to talk amongst yourselves in a group setting, smaller groups, kind of helped us all open up more. (Dallas)

Being able to reflect on the clinical reasoning process strengthens clinical judgment (Tanner, 2006). This can be fostered by working in a group (Lasater, 2007a). Participants in the intervention groups accessed reference materials more frequently and talked more among themselves than did the control group. Being in a small group rather than a large class may have encouraged participants in the intervention groups to be more active in their learning and to take more responsibility toward that goal.

While the overall student response was positive, limitations of the strategy were typical of working in a group. Some participants were able to reason and

process the information more quickly, which may have affected the learning by others in the group.

> Sometimes others would pick it up quickly and then there's the rest of us that it takes awhile longer. (Alex)

> When we had a session and somebody did most of it really quick, then it takes away from you trying to figure out. So you didn't always have time to process. (Corey)

Limitations

The following limitations are acknowledged for this investigation:

1. Since only baccalaureate nursing students from one nursing program in the Midwest were included in this sample, the results cannot be generalized to nursing students in other nursing programs.
2. Since only baccalaureate nursing students were included in this sample, the results cannot be generalized to diploma or associate degree nursing students.
3. Since only baccalaureate nursing students were included in this sample, the results cannot be generalized to vocational or practical nursing programs.

Recommendations

Recommendations for nursing practice, nursing theory development, nursing education, and future research are presented in this section. Professional nursing is a function in all these areas and improvements in one area will also improve other areas.

Nursing Practice. Critical thinking and clinical judgment are vital to successful nursing practice. The goal of nursing education is to prepare the graduate nurse for the role of a professional nurse. It is recommended that further research include studies that evaluate the development of these skills. In addition, how do professional nurses perceive their courses in nursing school prepared them to utilize critical thinking and clinical judgment in their daily practice?

Theory Development. Tanner's Clinical Judgment Model (2006) and provided a framework for this investigation. Tanner used the terms critical thinking and clinical judgment interchangeably. Tanner viewed clinical judgment as four phases that are not linear in nature. Providing instruction in critical thinking and clinical judgment that follows this model may provide additional structure that aids nursing students' development of these skills. It is recommended that future research include studies where the Tanner Model is utilized.

Nursing Education. Nursing programs are challenged to provide learning experiences that are evidence-based. It is imperative that quantitative and qualitative research guide nursing faculty in program planning and curriculum development to determine best practices in promoting development of critical thinking and clinical judgment. The goal of nursing education is to prepare the graduate nurse for the role of a professional nurse. In this study, grand rounds showed potential as a possible educational strategy that could be implemented in a variety of settings. It is recommended that future research involve replicating this teaching strategy in other populations.

Critical thinking and clinical judgment have been identified as essential skills as part of professional nursing practice. However, measuring these skills remains a challenge. While the Assessment Technologies Institute Critical Thinking Assessment was developed along the clinical reasoning process as part of critical thinking and clinical judgment, it is a challenge to assess the nuances in decisions made in a healthcare dilemma (Walsh & Seldomridge, 2006). Continued research in developing an appropriate assessment tool for these skills is recommended.

Teaching effective critical thinking and clinical judgment skills to students remains a priority. Strategies have often shown mixed results or results are short-lived. Tanner (2006) and Lasater (2007b) have developed frameworks for developing clinical judgment. Using the framework may be helpful for novice practitioners in the clinical setting. Since it is not plausible to teach students all the content they might need, instructing them in the use of a guiding framework may help them develop their critical thinking and clinical judgment skills. (Walsh & Seldomridge, 2006)

Future Research. Nursing research influences and affects nursing theory which, in turn, guides nursing practice. Recommendations for future research are:

1. Replicate this investigation at other baccalaureate nursing programs with a larger sample size.
2. Replicate this investigation at associate degree and diploma nursing programs.

3. Replicate other teaching strategies that have shown initial potential of developing critical thinking and clinical judgment with larger populations and stricter research design.
4. Conduct qualitative studies examining the professional nurse's perspective on critical thinking and clinical judgment development in nursing education.
5. Investigate the efficacy of using Tanner's Clinical Judgment Model as a structure for teaching critical thinking and clinical judgment.
6. Continue to investigate teaching strategies that promote development of critical thinking and clinical judgment skills in nursing students.
7. Develop and investigate teaching strategies that address students' learning styles.
8. Develop an assessment tool that evaluates the critical thinking and clinical judgment evident in nursing practice.

Summary

This investigation examined the effectiveness of grand rounds as an instructional strategy to promote development of critical thinking and clinical judgment skills in baccalaureate nursing students. The variables for this study were critical thinking skills as assessed with Assessment Technologies Institute (ATI) Critical Thinking Assessment and clinical judgment as assessed with the Lasater Clinical Judgment Rubric. There was no significant relationship between critical thinking skills and clinical judgment. There was no significant difference between

the intervention groups' scores and the comparison group's scores on the ATI Critical Thinking Assessment between the beginning of the nursing program and at the conclusion of the study. There was no significant difference between the second administration of the Critical Thinking Assessment between the intervention groups and the control group. A significant difference was noted between clinical judgment scores between the intervention groups and the comparison group, $p < 0.10$. Qualitative analysis revealed that participants preferred the teaching strategy to other strategies currently in use at this nursing program. Participants cited the small group size, discussion, learning from each other, and the group process as benefits of grand rounds. However, the sample size was small which limits the conclusions that can be drawn from this investigation. Providing a quality nursing education that is evidence-based should be a goal of all nursing programs. Further investigation of these variables and instructional strategies that aid in their development is encouraged.

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Appendix A

Lasater Clinical Judgment Rubric

Dimension	Exemplary-4	Accomplished-3	Developing-2	Beginning-1
Effective noticing involves:				
Focused observation	Focuses observation appropriately; regularly observes and monitors a wide variety of objective and subjective data to uncover any useful information	Regularly observes and monitors a variety of data, including both subjective and objective; most useful information is noticed; may miss the most subtle signs	Attempts to monitor a variety of subjective and objective data but is overwhelmed by the array of data; focuses on the most obvious data, missing some important information	Confused by the clinical situation and the amount and kind of data; observation is not organized and important data are missed, and/or assessment errors are made
Recognizing deviations from expected patterns	Recognizes subtle patterns and deviations from expected patterns in data and uses these to guide the assessment	Recognizes most obvious patterns and deviations in data and uses these to continually assess	Identifies obvious patterns and deviations, missing some important information; unsure how to continue the assessment	Focuses on one thing at a time and misses most patterns and deviations from expectations; misses opportunities to refine the assessment
Information seeking	Assertively seeks information to plan intervention: carefully collects useful subjective data from observing and interacting with the patient and family	Actively seeks subjective information about the patient's situation from the patient and family to support planning interventions; occasionally does not purse important leads.	Makes limited efforts to seek additional information from the patient and family; often seems not to know what information to seek and/or pursues unrelated information	Is ineffective in seeking information; relies mostly on objective data; has difficulty interacting with the patient and family and fails to collect important subjective data
Effective interpreting involves:				
Prioritizing data	Focuses on the most relevant and important data useful for explaining the patient's condition	Generally focuses on the most important data and seeks further relevant information but also may try to attend to less pertinent data	Makes an effort to prioritize data and focus on the most important, but also attends to less relevant or useful data	Has difficulty focusing and appears not to know which data are most important to the diagnosis; attempts to attend to all available data

Making sense of data	Even when facing complex, conflicting, or confusing data, is able to (a) note and make sense of patterns in the patient's data, (b) compare these with known patterns (from the nursing knowledge base, research, personal experience, and intuition), and (c) develop plans for interventions that can be justified in terms of their likelihood of success	In most situations, interprets the patient's data patterns and compares with known patterns to develop an intervention plan and accompanying rationale; the exceptions are rare or in complicated cases where it is appropriate to seek the guidance of a specialist or a more experienced nurse.	In simple, common, or familiar situations, is able to compare the patient's data patterns with those known and to develop or explain intervention plans; has difficulty, however, with even moderately difficult data or situations that are within the expectations of students; inappropriately requires advice or assistance	Even in simple, common, or familiar situations, has difficulty interpreting or making sense of data; has trouble distinguishing among competing explanations and appropriate interventions, requiring assistance both in diagnosing the problem and developing an intervention

Effective responding involves:

Calm, confident manner	Assumes responsibility; delegates team assignments; assesses patients and reassures them and their families	Generally displays leadership and confidence and is able to control or calm most situations; may show stress in particularly difficult or complex situations	Is tentative in the leader role; reassures patients and families in routine and relatively simple situations, but becomes stressed and disorganized easily	Except in simple and routine situations, is stressed and disorganized, lacks control, makes patients and families anxious or less able to cooperate
Clear communication	Communicates effectively; explains interventions; calms and reassures patients and families; directs and involves team members, explaining and giving directions; checks for understanding	Generally communicates well; explains carefully to patients; gives clear directions to team; could be more effective in establishing rapport	Shows some communication ability (e.g., giving directions); communication with patients, families, and team members is only partly successful; displays caring but not competence	Has difficulty communicating; explanations are confusing; directions are unclear or contradictory; patients and families are made confused or anxious and are not reassured

Well-planned intervention/flexibility	Interventions are tailored for the individual patient; monitors patient progress closely and is able to adjust treatment as indicated by patient response	Develops interventions on the basis of relevant patient data; monitors progress regularly but does not expect to have to change treatments	Develops interventions on the basis of the most obvious data; monitors progress but is unable to make adjustments as indicated by the patient's response	Focuses on developing a single intervention, addressing a likely solution, but it may be vague, confusing, and/or incomplete; some monitoring may occur
Being skillful	Shows mastery of necessary nursing skills	Displays proficiency in the use of most nursing skills; could improve speed or accuracy	Is hesitant or ineffective in using nursing skills	Is unable to select and/or perform nursing skills

Effective reflecting involves:

Evaluation/self-analysis	Independently evaluates and analyzes personal clinical performance, noting decision points, elaborating alternatives, and accurately evaluating choices against alternatives	Evaluates and analyzes personal clinical performance with minimal prompting, primarily about major events or decisions; key decision points are identified, and alternatives are considered	Even when prompted, briefly verbalizes the most obvious evaluations, has difficulty imagining alternative choices; is self-protective in evaluating personal choices	Even prompted evaluations are brief, cursory, and not used to improve performance; justifies personal decisions and choices without evaluating them
Commitment to improvement	Demonstrates commitment to ongoing improvement; reflects on and critically evaluates nursing experiences; accurately identifies strengths and weaknesses and develops specific plans to eliminate weaknesses	Demonstrates a desire to improve nursing performance; reflects on and evaluates experiences; identifies strengths and weaknesses; could be more systematic in evaluating weaknesses	Demonstrates awareness of the need for ongoing improvement and makes some effort to learn from experience and improve performance but tends to state the obvious and needs external evaluation	Appears uninterested in improving performance or is unable to do so; rarely reflects; is uncritical or himself or herself or overly critical (given level of development); is unable to see flaws or need for improvement

Appendix B

Recruitment Statement

My name is Jeanne Mann. As a doctoral student working on my dissertation within the School of Education at the University of Kansas, I am assessing nursing students' development of critical thinking and clinical judgment skills. I am inviting you to participate in this investigation that will include Baker University School of Nursing Level II students. To be able to participate, you must be a Level II nursing student over the age of 18.

The study will focus on resolving a healthcare dilemma within a group of your peers during this semester, an interview, and completion of the ATI Critical Thinking Assessment. The time required of you for your participation is approximately four to five hours in divided periods. There is no payment for your participation, but you will receive 1% extra credit in Nursing of Adults Acute. If you do not want to participate in the research but still receive the 1% extra credit, there are 5 ATI study modules that you will complete.

Results from this investigation could assist in curriculum planning and development. The Institutional Review Boards at the University of Kansas and at Baker University have approved this research. Participation in this study is voluntary. All information will be kept confidential. Consent may be withdrawn at any time during the investigation. If you are interested in nursing research, this would be a great opportunity for you. I will contact you later to schedule a time to meet.

Appendix C

INFORMED CONSENT FORM

TITLE OF STUDY: Promoting Curriculum Choices: Critical Thinking and Clinical Judgment Skill Development in Baccalaureate Nursing Students

INTRODUCTION

The Department of Curriculum and Teaching at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You may refuse to sign this form and not participate in this study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect your relationship with this unit, the services it may provide to you, or the University of Kansas.

PURPOSE OF THE STUDY

The purpose of this study will be to evaluate the effectiveness of grand rounds as an educational strategy to develop critical thinking and clinical judgment skills in baccalaureate nursing students.

PROCEDURES

You will be assigned to one of four groups. If you are in one of three groups, you will be asked to resolve a healthcare dilemma within a group of your peers at two separate sessions. The session will be videotaped. The audio portion of the videotape will be transcribed and analyzed. You will be asked to complete a personal interview. You will complete the Assessment Technologies Institute Critical Thinking Test and your results will be compared with your results on the same test you took at the beginning of the nursing program. Your identity will be held in confidence. The time requirement for your participation in one of these three groups will be approximately five (5) hours in divided sessions. If you are in the fourth group, you will be asked to resolve a healthcare dilemma within a group of your peers on one occasion. The session will be videotaped. The audio portion of the videotape will be transcribed and analyzed. Your identity will be held in confidence. You will complete the Assessment Technologies Institute Critical Thinking Test and your results will be compared with your results on the same test you took at the beginning of the nursing program. The time requirement for your participation in this fourth group will be approximately two and one-half (2 ½) hours in divided sessions.

RISKS

There are no risks identified for this study.

BENEFITS

You may benefit from the sessions as it may improve your critical thinking and clinical judgment.

PAYMENT TO PARTICIPANTS

There is no payment for participants in this study. Students who participate in this study will receive a one per cent (1%) bonus for the course NU 385, Nursing of Adults Acute.

PARTICIPANT CONFIDENTIALITY

Your name will not be associated in any way with the information collected about you or with the research findings from this study. The researcher will use a pseudonym instead of your name. The researcher will not share information about you unless required by law or unless you give written permission. By signing this form you give permission for the use and disclosure of your information for purposes of this study at any time in the future.

REFUSAL TO SIGN CONSENT AND AUTHORIZATION

You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from Baker University or to participate in any programs or events of Baker University. However, if you refuse to sign, you cannot participate in this study.

CANCELLING THIS CONSENT AND AUTHORIZATION

You may withdraw your consent to participate in this study at any time. You also have the right to cancel your permission to use and disclose information collected about you, in writing, at any time, by sending your written request to: Jeanne Mann, 3921 Trail Road, Lawrence, KS, 66049. If you cancel permission to use your information, the researchers will stop collecting additional information about you. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

QUESTIONS ABOUT PARTICIPATION

Questions about procedures should be directed to the researcher listed at the end of this consent form.

PARTICIPANT CERTIFICATION:

I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study. I understand that if I have any additional questions about my rights as a research participant, I may call (785) 864-7429 or (785) 864-7385 or write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7563, email mdenning@ku.edu.

I agree to take part in this study as a research participant. By my signature I affirm that I am at least 18 years old and that I have received a copy of this Consent and Authorization form.

_____ _____

Type/Print Participant's Name Date

_____

Participant's Signature

Researcher Contact Information

Jeanne Mann
Principal Investigator
3921 Trail Road
Lawrence, KS 66045
785 764-2369

Dr. Marc Mahlios
Dissertation Committee Chair
Department of Curriculum and Teaching
1122 West Campus Road
University of Kansas
Lawrence, KS 66045
785 864-9721

Appendix D

Lasater Permission Letter

Dear Jeanne,

So great to hear from you and of your interest in using the rubric for your dissertation. Of course, you have my permission to use it for your purposes. In return, I would ask only two things:

--that for whatever purpose you reproduce the rubric, you properly cite it;

--that you let me know how you used it, how it went, and any suggestions you might have for improvement (this helps me as I talk to others about all the various uses it can have—far beyond what I dreamed of; also, I'm thinking just 2-3 sentences, not an in-depth analysis).

I'm attaching an electronic copy as well as a copy of the scoresheet I used for my research; you can modify, delete, or use it as is—your choice.

Best to you,
Kathie
Kathie Lasater, EdD, RN, ANEF
Associate Professor
OHSU School of Nursing
NLN Ambassador
3455 SW Veterans' Hospital Rd., SN-4S
Portland, OR 97239
(503) 494-8325

Appendix E

Interview Questions

1. What stimulated your interest in nursing or motivated you to become a nurse?

2. Have you had any other experience in a healthcare field?

3. What is your definition of critical thinking?

4. How would critical thinking be used in nursing?

5. What is your definition of clinical judgment?

6. How would clinical judgment be used in nursing?

7. How does critical thinking affect clinical judgment?

8. Are there experiences in nursing school, either clinical or in the classroom, that have helped you develop your critical thinking and clinical judgment?

Probes: How did concept maps help you develop these abilities?

How did case studies help you develop these abilities?

How did your instructors' questioning you about your patients help you develop these abilities?

How did simulation lab help you develop these abilities?

9. What are the benefits you have noticed using the grand rounds as a strategy to help you develop critical thinking and clinical judgment?

10. What are the drawbacks to using grand rounds?

11. How has your clinical practice and performance in the classroom been influenced by grand rounds?

Appendix F

KU RESEARCH & GRADUATE STUDIES
The University of Kansas

1/29/2010
HSCL #18442

Jeanne Mann
3921 Trail Road
Lawrence, KS 66049

The Human Subjects Committee Lawrence Campus (HSCL) has received your response to its expedited review of your research project

18442 Mann/Mahlios (C & T) Promoting Curriculum Choices: Critical Thinking and Clinical Judgement Skill Development in Baccalaureate Nursing Students

and approved this project under the expedited procedure provided in 45 CFR 46.110 (f) (7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

The Office for Human Research Protections requires that your consent form must include the note of HSCL approval and expiration date, which has been entered on the consent form(s) sent back to you with this approval.

1. At designated intervals until the project is completed, a Project Status Report must be returned to the HSCL office.
2. Any significant change in the experimental procedure as described should be reviewed by this Committee prior to altering the project.
3. Notify HSCL about any new investigators not named in original application. Note that new investigators must take the online tutorial at http://www.rcr.ku.edu/hscl/hsp_tutorial/000.shtml.
4. Any injury to a subject because of the research procedure must be reported to the Committee immediately.
5. When signed consent documents are required, the primary investigator must retain the signed consent documents for at least three years past completion of the research activity. If you use a signed consent form, provide a copy of the consent form to subjects at the time of consent.
6. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.

Please inform HSCL when this project is terminated. You must also provide HSCL with an annual status report to maintain HSCL approval. Unless renewed, approval lapses one year after approval date. If your project receives funding which requests an annual update approval, you must request this from HSCL one month prior to the annual update. Thanks for your cooperation. If you have any questions, please contact me.

Sincerely,

Mary Denning

Mary Denning
Coordinator
Human Subjects Committee Lawrence

cc: Marc Mahlios

Human Subjects Committee Lawrence
Youngberg Hall | 2385 Irving Hill Road | Lawrence, KS 66045 | (785) 864-7429 | Fax (785) 864-5049 | www.rcr.ku.edu/hscl

BAKER UNIVERSITY
Own Confidence

January 21, 2010

Jeanne Mann
Baker University School of Nursing.
1500 Southwest 10th Street
Topeka, KS 66604-1353

Dear Ms Mann:

The Baker University IRB has reviewed your research project application (M-0079-0113-0121) and approved this project under Exempt Review. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

The Baker University IRB requires that your consent form must include the date of approval and expiration date (one year from today). Please be aware of the following:

1. At designated intervals (usually annually) until the project is completed, a Project Status Report must be returned to the IRB.
2. Any significant change in the research protocol as described should be reviewed by this Committee prior to altering the project.
3. Notify the OIR about any new investigators not named in original application.
4. Any injury to a subject because of the research procedure must be reported to the IRB Chair or representative immediately.
5. When signed consent documents are required, the primary investigator must retain the signed consent documents for at least three years past completion of the research activity. If you use a signed consent form, provide a copy of the consent form to subjects at the time of consent.
6. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.

Please inform Office of Institutional Research (OIR) or myself when this project is terminated. As noted above, you must also provide OIR with an annual status report and receive approval for maintaining your status. If your project receives funding which requests an annual update approval, you must request this from the IRB one month prior to the annual update. Thanks for your cooperation. If you have any questions, please contact me.

Sincerely,

Charmaine B. S. Henry

Charmaine Henry, PhD
Chair, Baker University IRB

P.O. Box 65
Baldwin City, KS 66006
785.594.6451 | 785.594.2522 fax
www.bakerU.edu

Appendix G

Lasater Clinical Judgment Rubric Scoring Sheet

Student Name: Observation Date/Time:
Scenario #:

Clinical Judgment Components	**Observation Notes**
Noticing: • Focused Observation: E A D B • Recognizing Deviations from Expected Patterns: E A D B • Information Seeking: E A D B	
Interpreting: • Prioritizing Data: E A D B • Making Sense of Data*:* E A D B	
Responding: • Calm, Confident Manner: E A D B • Clear Communication: E A D B • Well-Planned Intervention/Flexibility: E A D B • Being Skillful: E A D B	

Reflecting: • Evaluation/Self-Analysis: E A D B • Commitment to Improvement: E A D B	
Summary Comments:	

Lasater Clinical Judgment Rubric Scoring Sheet. Reprinted with permission from Kathie Lasater, Ed.D. ©Developed by Kathie Lasater, Ed.D.; Based on Tanner's Integrative Model of Clinical Judgment (2006).