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# Comparison of a residency-based educational model with a traditional clinical education model on perceived clinical decision-making competencies in undergraduate nursing students

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# COMPARISON OF A RESIDENCY-BASED EDUCATION MODEL WITH A TRADITIONAL CLINICAL EDUCATION MODEL ON PERCEIVED CLINICAL DECISION-MAKING COMPETENCIES IN UNDERGRADUATE NURSING STUDENTS

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Dissertation Abstract

# Comparison of a Residency-Based Educational Model with a Traditional Clinical Education Model on Perceived Clinical Decision-Making Competencies in Undergraduate Nursing Students

This study compared the clinical decision-making competencies of nursing students trained in the residency-based clinical teaching approach with nursing students who are prepared using the traditional instructor-led clinical group before and after completion of a one-semester clinical course. Student satisfaction with their clinical instructor or preceptor and overall clinical experience was evaluated. The effect of such variables as prior clinical experience and age on perceived competency in clinical decision making also was investigated. This study used the Clinical Decision Making in Nursing Scale (CDMNS) to assess nursing students' perceived competencies around gathering and synthesizing data in order to make clinical decisions. The CDMNS was administered at the beginning and at the end of the academic semester. A satisfaction tool was completed by students at the end of the semester and results were used to identify differences between student experiences in the traditional instructor-led clinical group and the residency-based clinical group. Using Benner's theory of Novice-to Expert as a framework, students were expected to improve perceived competencies in clinical decision making after engaging in the clinical experience over the course of the semester.

There were no statistically significant differences on CDMNS change scores between students in the residency-based clinical course and those in the traditional

clinical course. There was a greater change seen from pretest to posttest in the residency-based group when compared with the traditional group. Statistical analysis examining change scores for each of the four subscales showed that no statistically significant differences between students in the residency-based and traditional clinical course were identified. The same pattern of change found for the total was found for the two groups of residency-based students on the subscales. Results addressing traditional and residency-based student satisfaction with the clinical experience showed no statistically significant differences. This study examines a number of critical issues within the current clinical nursing-education model including student perception of clinical decision-making competence and student satisfaction with the clinical experience. Further research focusing on methods of fostering clinical decision making in nursing education continues and the development of effective tools for the assessment of clinical decision making is essential.

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This dissertation, written under the direction of the candidate's dissertation committee and approved by the members of the committee, has been presented to and accepted by the Faculty of the School of Education in partial fulfillment of the requirements for the degree of Doctor of Education. The content and research methodologies presented in this work represent the work of the candidate alone.

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# CHAPTER I

# INTRODUCTION

## Statement of the Problem

Clinical education in the field of nursing historically has consisted of instructor-led groups of students, rotating through different hospital units. The most common structure of a clinical group is one instructor and 10 nursing students. The instructor's role is to identify appropriate patients for whom the student may care, to guide the students in the practice of their nursing skills, and to assess the students' clinical competencies. The instructor essentially is given the charge of instructing all 10 students in clinical nursing. There is an inherent logistical challenge in this structure wherein a clinical instructor is limited to working with one student-patient dyad at a given time. In the instructor's absence, the other nine students are encouraged to work closely with the registered nurse who is caring for the patients the students have been assigned. Students, however, most often work with different nurses each clinical day, thus creating a disjointed experience with regard to role modeling (Diefenbeck, Plowfield, & Herrman, 2006).

In the existing clinical-teaching model, the students focus on learning nursing skills such as head-to-toe assessments, intravenous (IV) catheter insertion, and urinary catheterizations. Although skill acquisition of this type is necessary for safe nursing care, the learning experience can often be a fragmented one where students focus on the task but fail to take in the larger picture of managing the care of a patient or patient load. Being able to step back and view the patient as a whole, instead of as a series of tasks, is part of the progression of clinical competency (Benner, 1982).

The current clinical-education model, however, does not provide the most effective pedagogical framework to promote this inclusive approach.

The present healthcare environment is one in which there is an increasing shortage of registered nurses (American Association of Colleges of Nursing [AACN], 2007; National League for Nurses [NLN], n.d.). New graduates must be able to function safely and independently from the moment they begin working (Oermann, 2004). In response to the needs of this environment, a new residency-based clinical-teaching model was proposed. The clinical-teaching model was implemented in the undergraduate nursing curriculum and created a clinical learning environment in which students were (a) placed within one healthcare facility or consortium for the majority of their undergraduate clinical experience and (b) paired with nurse preceptors for each of their clinical rotations. The hypothesis was that within the residency, students not only will learn necessary nursing skills but also will be able to model their thinking and decision-making on that of their nurse preceptors. Instead of the fragmented clinical practice many students currently experience, where they work with different nurses every clinical shift and focus mainly on task competency, the residency will provide the opportunity for students to view the practice of nursing as a holistic endeavor.

With the number of nurses prepared to fill the need for skilled healthcare providers decreasing, nurses who do enter into clinical work must be able to perform at a safe and competent level as soon as they graduate from a nursing-education program. Decisions made in the clinical environment directly affect patient outcomes. Nurses can create positive outcomes for a patient by recognizing salient

changes in health status or the efficacy of a medication and making decisions that synthesize this information into more informed nursing care. Alternatively, nurses can create negative consequences by failing to make an appropriate decision based on health assessment data and not redirecting the course of care or alerting the health-care team when a patient is in need of life-supporting assistance. The decisions made by novice nurses involve the same amount of consequence as decisions made by veteran nurses. Patients' well-being, and often their lives, depend on the clinical abilities and decision-making skills of nurses. The burden of adequate preparation in clinical decision making is placed necessarily on nursing education thus it is essential that nursing education develop the most effective methods of clinical preparation possible (Jenkins, 1985b).

## Purpose of the Study

The purpose of the study was to compare the clinical decision-making competencies of students trained in the residency-based clinical teaching approach with students who are prepared using the traditional instructor-led clinical group after completion of a one-semester clinical course. Student satisfaction with their clinical instructor or preceptor and overall clinical experience was evaluated. The effect of such variables as prior clinical experience and age on perceived competency in clinical decision making also was investigated.

This study used the Clinical Decision Making in Nursing Scale (CDMNS) (Jenkins, 1985a) to assess nursing students' perceived competencies around gathering and synthesizing data in order to make clinical decisions. The CDMNS is divided into four subscales that assess students' perceived ability for recognition and assimilation

of new information while developing awareness that the data belong to a larger pattern. This awareness enables the student to make a decision that synthesizes new clinical information with information that has been experienced previously. As the CDMNS was administered to students at the beginning of their first semester-long hospital-based clinical rotation and at the end of this rotation, it was anticipated that students should have demonstrated improved CDMNS scores across all four subscales over the course of the semester.

The high level of patient acuity and the complexity of the healthcare delivery system demand that nurses are prepared to think critically and make sound decisions as soon as they enter the clinical setting. The residency-based approach can be a key component of the solution toward preparing safer, more competent new graduate nurses. The research supports the notion that when students are able to remain in one clinical setting for the duration of their clinical training and to work one-on-one with a nurse preceptor they can achieve higher levels of clinical competency. Few studies, however, have investigated the effect of precepted, residency-based clinical education on perceived clinical-decision-making competencies of undergraduate nursing students.

## Background and Need

In order to understand the contextual variables surrounding the preparation of student nurses for practice, especially with regard to clinical decision-making skills, a presentation of past and current issues in the nursing profession and in nursing education is necessary. Particular attention will be paid to the present health-care environment, clinical-judgment competencies, student preparation, the clinical

residency model, academic-service partnerships, and clinical decision making as an essential skill to nursing practice.

*Present Healthcare Environment*

There exist increasing challenges to nurses in the current healthcare-delivery system (del Bueno, 2001; Joel, 2002). Patients on acute-care units require progressively more complex care, and nurses must be able to provide safe and competent nursing care. Nursing practice combines technical ability with the ability to recognize changes in patient status and the necessity of managing the patient's care as key part of the larger healthcare team (del Bueno, 2005). Issues such as increased use of technology, more focus on cost-containment, and a move toward providing care in the community where nursing care is necessarily more autonomous confront nurses on a daily basis (Joel). Nurses also must collaborate as part of an interdisciplinary team to ensure coordination of patient care and effective quality assurance. Given this professional climate, there is a critical need for nurses who are highly functioning and able to engage in independent decision-making (Joel).

Using the novice-to-expert (Benner, 1982) theoretical framework, nurses do become proficient at providing the complex care necessary for the current health-care environment. This level of proficiency, however, occurs after several years of nursing practice (Benner). According to the novice-to-expert theoretical model (Benner), when nurses first begin to practice, they are rule-bound and task-oriented and are not able to recognize the larger patient picture. Regardless of where nurses are in their level of proficiency when they practice, the fact remains that all nurses are responsible for numerous clinical decisions that affect the health and safety of their

patients each day. The expectation for timely and accurate decision making is the same for novice nurses as it is for expert nurses. Not having had the years of experience deemed necessary for development of enhanced clinical judgment by Benner, new graduates are at a distinct disadvantage when it comes to safe nursing practice, as are their patients.

*Clinical-judgment Competencies*

Evaluations of new graduate nurses have indicated that they are "deficient in clinical skills and judgment and [have] unrealistic expectations of the work environment" (Haas et al., 2002, p. 519). Specifically, del Bueno (2005) found that upon graduation from a nursing program, only 35% of new registered nurses meet expectations for clinical judgment. These findings are based on results of the Performance Based Development System (PBDS), a tool used since 1985 to evaluate new employees in several areas of nursing care that require clinical judgment. The PBDS was developed to provide a qualitative evaluation of competency in practicing nurses. It includes video simulations of patient situations in which nurses are required to make assessments and decisions about care. The ability of new graduates to identify accurately a patient's current or changing health status, initiate action to prevent further harm, act in a timely manner, and provide rationale for actions is assessed using the PBDS (del Bueno). That 65% of new graduates do not meet employer expectations for entry-level clinical-judgment competencies is an enormous concern for health-care organizations, the nursing profession, and, of course, patients. In the current health-care environment of increased acuity and complexity of care, patients depend on nurses to act as their advocates (Joel, 2002). When a portion of

the nurses providing care are unable to meet performance expectations, such as recognizing change in health status or initiating action, the public safely can assume that neither advocacy or safe patient care is taking place.

The current shortage of registered nurses is contributing to the problem of hiring new graduate nurses who may not be ready to function at the expected level of competency. In order to fill vacant positions, healthcare organizations must make choices between availability and quality. Although availability of large amounts of unfilled positions does not preclude quality applicants, the nursing shortage creates a market in which the need for competent applicants often exceeds the supply (del Bueno, 2001). Hospitals are finding that, although new nursing graduates successfully have passed the National Council Licensure Examination (NCLEX), or nursing board examination, passing necessarily does not indicate that they are safe to practice. Health-care organizations, therefore, are driven to assess their new graduate employees to ensure that they are providing safe and competent nursing care. New graduates are able to pass the NCLEX indicating that they are proficient in content but are unable to, or have difficulty with, applying theory to practice (del Bueno, 2005). Of additional concern is the fact that PBDS findings indicate that the competency level of new graduate nurses is declining. The percent of new graduates meeting entry-level competency expectations have fallen from a high of 43% in 1996 to 30% in 2004 (del Bueno, 2001, 2005).

Although experienced nurses, defined as those with more than one year of active clinical experience, demonstrate higher levels of competency on the PBDS (66% met competency expectations in 2004; del Bueno, 2005), a key finding from the

PBDS data shows that increased years of nursing experience necessarily do not lead to higher levels of competency. When competency in specific areas of clinical practice were compared with other clinical services such as the medical-surgical unit, intensive-care unit, general obstetrics, and mental health, del Bueno (2001) found that nurses in labor and delivery, emergency services, and the operating room demonstrated a higher level of acceptable competency results. Benchmark data showed nurses in the first three specialty areas exhibiting results from 80% to 85%, whereas their counterparts demonstrated competency levels of 40% to 65%. These findings not only suggest that competency levels may be patient-population specific but also that years of experience in nursing does not necessarily lead to increased competency. This view is supported by the description of competency development in Benner's (1982) Novice to Expert framework. Some nurses, regardless of how long they have practiced, do not progress to the expert or even proficient level. The question that then arises is why some nurses are able to move successfully through the stages of skill acquisition and competency whereas others become situated in an arrested level of professional development. One key factor is the educational preparation received by nurses from the schools of nursing they attend.

*Student Preparation*

Nursing education provides the foundation from which nurses learn the art and science of their profession. Content underpinning health assessment, nursing interventions, pharmacology, therapeutic communication, and management of patient care forms the core of nursing curriculum and is necessary for safe nursing practice. Metacognitive strategies, such as knowing how one best learns and continual

reflection on strengths and limitations, however, also need to be emphasized in order to facilitate life-long professional growth. Pedagogical practices that emphasize questioning of rationales for actions can facilitate development of decision making, especially in the clinical setting. Nursing is a "practice art" (del Bueno, 2001, p. 281), and students need to be able to apply content they have learned in a setting that provides real-world circumstances and variability. There is a trend in nursing education to focus on content and not application, and nursing faculty continually are adding new and vital content to curricula often without deleting existing content (Adams, Valiga, Murdock, McGinnis, & Wolfertz, 2004). The emphasis on students learning content is overshadowing the importance of content application. The result of these two trends is a content-heavy curriculum in which opportunity for synthesis and application of content continually is being reduced (del Bueno, 2005).

The clinical practicum component of the nursing curriculum is where students are meant to be able to apply content learned in theory classes to real-life practice situations. The traditional clinical-education model that is still used in the vast majority of nursing programs is that in which an academic faculty member performs all clinical teaching and evaluation with a small group of students. There is minimal research, however, to support the effectiveness of this type of clinical teaching model (Oermann, 2004). Furthermore, this model of clinical education is expensive for nursing programs and adds stress to the faculty role (Oermann, 1998). Among stressors cited by faculty members was the multitude of roles for which they were responsible as clinical instructor (e.g., assignment planning, student teaching and evaluation, acting as a liaison with clinical staff, expectation of maintaining clinical

competence with little time to do so, and teaching students who were not adequately prepared; Oermann). The lack of data clearly supporting the current model of clinical teaching coupled with findings showing that new graduate nurses are ill-prepared to take on the role of professional clinician indicate that it is time for a new form of clinical education to be considered.

Graduation from a school of nursing does not guarantee the technological or decision-making skills necessary for new graduate nurses to function in the clinical environment (Oermann, 2004). In response to the call for more effective models of clinical teaching, recommendations have emerged from nurse faculty and nursing and health-care organizations. One suggestion focuses on restructuring clinical activities to meet the learning needs of the students and to facilitate the development of knowledge and competencies instead of concentrating solely on number of hours in the clinical setting (Oermann; Tanner, 2006). The quality of the clinical experience and the opportunity for engagement in nursing care at a level appropriate to the student's learning needs are more important than sheer quantity of time in the clinical setting if the learning needs are not being met.

Another proposal considered to be the most critical intervention that can be implemented for improved clinical judgment or clinical decision making is for a student to work with a preceptor who teaches and guides through asking questions rather than simply providing information and answers (del Bueno, 2005; Tanner, 2006). Questions such as "What evidence do you have (primary/secondary source, objective/subjective) or need to collect to determine the effectiveness of your intervention?" (del Bueno, p. 282) can be asked of students in order for them to

engage in the process of thinking critically about the rationale behind their assessment and plan of action. Using this strategy as part of the remediation process for nurses who do not meet competency levels on the PBDS has shown to be very effective. In a study of seven groups of inexperienced registered nurses who initially were assessed using the PBDS and then remediated either with a traditional internship in the hospital setting (n = 3) or with the question-focused model of coaching (n = 4), the latter groups all showed a marked increase in competency upon reassessment (del Bueno). Clinical competency comes with years of experience according to the novice-to-expert framework (Benner, 1982).

Results from the PBDS remediation techniques, however, show that competency can be enhanced by student engagement with a preceptor who instructs and guides using a question-based approach. If students are to be successful clinical decision makers upon graduation from nursing school, perhaps it is time to look at the progression of clinical competence as one that can be better facilitated through innovative clinical-education models that help prepare new graduate nurses to begin functioning at a more advanced level along the novice to expert continuum.

*Clinical-residency Model*

The clinical-residency model was proposed to fit this need for early experience with a nurse preceptor through which nursing students can gain not only technical skill but also the clinical-decision-making proficiencies needed for safe and competent nursing practice. Clinical education in nursing historically consisted of hospital-based training or diploma programs. Emphasizing technical proficiency over theory, diploma programs were structured to prepare student nurses for clinical

competency. Students completed a large number of hours in one hospital setting as part of an apprenticeship model and graduated well prepared to take on the challenges of rigorous clinical practice. When nursing education moved from hospital-based training into the higher-education model that emphasized theory, physicians, hospitals, diploma nurse educators, and graduates opposed the change (Nelson, 2002). Associate- and baccalaureate-degree programs are now the predominant form of nursing education. Clinical competency of new graduates, however, is an issue that the nursing profession continues to face. As seen from the competency data of new graduates, students graduating from the current nursing programs are not meeting employers' expectations of clinical performance (del Bueno, 2001, 2005).

The reasons for the decrease in competency are manifold and include greater patient acuity, understaffing of nurses leading to higher patient loads, and increasing complexity of patient presentations and of the healthcare system itself. As part of the exploration into the reasons behind decreased levels of competency, however, nursing also must revisit how students are prepared clinically in nursing school. The historical apprenticeship model of clinical training provided nurses who were prepared to function safely and competently upon graduation. Currently, new graduate nurses are not well prepared and very often participate in a new graduate training program in which their clinical skills and conceptual understanding of the nursing care to be provided are honed by clinical preceptorship and didactic instruction. These new graduate training programs are hospital-sponsored, can run anywhere from 6 weeks to one year, and are expensive for the hospitals providing them.

In response to the need of the nursing profession for clinically competent new graduate nurses, it is time to reconsider the apprenticeships model. A residency-based clinical approach has been a recommended transformation for clinical education in nursing (Tanner, 2006) and has been proposed and implemented by a small number of schools of nursing, including the University of South Florida and the University of Delaware. At the University of Delaware, the Nurse Residency Model was put into practice with the core philosophical components of enhanced socialization for student nurses, facilitation of the transition into practice, and greater student accountability (Diefenbeck, Plowfield, & Herrman, 2006). The Nurse Residency Model also aimed to instill a passion for lifelong learning and involvement in mentoring relationships.

The structure of the model incorporated an innovative approach toward clinical education. Instead of spending clinical rotations in acute-care settings, of which placements increasingly are difficult to procure due to the rise in demand from the growing number of nursing schools, the definition of clinical education under the Nurse Residency Model was expanded to include traditional instructor-led inpatient hospital rotations, simulation laboratory experiences, independent field experiences, and clinical-work requirements or student-nurse externships (Diefenbeck et al., 2006). The independent field experiences were coordinated and supervised remotely by faculty. Students, however, were supervised directly by designated staff of the clinical agency in a preceptor model. The shift to remotely supervised clinical experiences was difficult for some faculty and agencies but inherent in the transition was increased responsibility of nursing students for completing field experiences.

The shift was positive also in that it alleviated the burden of clinical-teaching hours for the academic faculty allowing for more allotted time to teaching of theory and research endeavors. The clinical-work requirements stipulated that students complete two one-unit courses of 80 hours in which they were to work at an outside health facility. Completed in the junior year, the aim of the courses was to increase student-patient contact, familiarity with the workplace, and a greater understanding of the operations of health-care facilities (Diefenbeck et al.).

A clinical immersion year comprised the final two semesters of the nursing program. Students were required to complete 24 hours per week rotating through six clinical areas, followed by a precepted clinical experience in an area of the students' choosing. As students were seniors, there was increased expectation of a high level of independent clinical preparation. Enhanced socialization and accountability and greater ease with the transition to practice was achieved through the completion of all the clinical experiences, culminating in the intensive clinical immersion year. Self-directed clinical learning experiences that were threaded throughout all of the students' clinical experiences allowed for fostering of internal motivation and locus of control. The clinical experiences outlined in the Nurse Residency Model can act as a guide for successful preparation of nursing students to be lifelong learners and thus better prepared upon graduation to meet the rapidly evolving conditions of the current healthcare environment.

Residency-based clinical experiences also can be structured in such a way that there is a partnership agreement between an academic and healthcare institution in which students train consistently within one hospital setting. This type of partnership

can foster adherence to the education-care continuum and can help address the long-term challenges of providing a nursing workforce that is sufficient in number and skill (O'Neil & Krauel, 2004).

*Academic-service Partnerships*

In order for residency-based programs to work, there must be mutually recognized benefits for each of the partners. Bleich, Hewlett, Miller, and Bender (2004) outlined several points to be considered when forming an academic-service partnership. Among the considerations is that there must be shared goals and outcomes benefiting each participant, a balanced exchange of resources, and established methods of measuring growth and success. Collaboration can take on many forms, but recommendations for success include standardized, in-depth curricular offerings, uniform development and sharing of clinical placements, standardized use of technology such as simulation stations, and students training at a single hospital site instead of rotating (O'Neil & Krauel, 2004). Such efforts would have the effects of easing the transition from education to practice and improving education outcomes thus increasing student participation in such a program.

Academic-service partnerships have provided benefits for both the participating university and hospital. A collaboration effort between the University of North Carolina at Chapel Hill School of Nursing and the University of North Carolina Hospitals (UNCH) resulted in the ability of faculty to influence promotion of evidence-based practice in the hospital setting. The hospital also gained increased exposure of nurse administrators and expert clinicians to graduate and undergraduate nursing students resulting in an increased number of senior-student practicums and

graduate-student mentorships. Additionally, hospital providers were able to participate in academic advisory committees and had the opportunity to influence curricular design. To further bridge the gap between academia and service, a strategic recruitment plan was set up for nursing students who had completed their clinical rotations at UNCH in which students entered an employment contract in exchange for funding for undergraduate-student tuition and fees. The recruitment strategy has ensured a stable flow of highly qualified new graduate nurses for UNCH (Smith & Tonges, 2004).

Studies have shown that improved patient outcomes are related to increased staffing levels of registered nurses, nurse educational levels, and professional-practice environments (Cronenwett, 2004). Academic-service partnerships can help contribute to better patient outcomes through increased recruitment and retention of qualified new graduate nurses and promotion of a professional-practice atmosphere (Smith & Tonges, 2004). Staff nurses who participate in the training and mentoring of new students form the backbone of the academic-service partnership. The staff nurse who expresses commitment to student learning can provide an environment that is both supportive of student learning and demonstrative of professional practice (Palmer, Cox, Callister, Johnsen, & Matsumura, 2005). In academia, some senior nursing faculty are becoming increasingly removed from nursing practice and, as a result, have limited knowledge about the complex realities of the delivery of care in the current healthcare system (Cronenwett). In order to answer the recent call by the Institute of Medicine for curricula that prepare nurses for practice in this complex environment, it is essential that academic-service partnerships, in which staff nurses

guide the practice of students, are pursued. Practicing staff nurses not only can facilitate proficiency with technical nursing skill but also can help foster student ability to navigate healthcare delivery in a complex system and the clinical decision-making skills necessary to provide safe and effective patient care in an ever-changing practice environment.

*Clinical Decision Making in Nursing*

As a profession, nursing embodies knowledge and skills unique to the discipline (Joel, 2002). Nursing requires cognitive artfulness in which it is essential to demonstrate the ability to manipulate mentally circumstances that have not yet been experienced and to draw relationships between these situations where none obviously may exist (Joel). One key area in clinical decision making is identifying inconsistencies in a given situation. It is through these inconsistencies, or deviations from what is expected, that other explanations are posited and a diagnosis ultimately can be made. In clinical decision making, nurses must identify the deviations from a normal clinical picture of health or illness in order to accurately perform a patient assessment and make a decision based on the data presented.

People are thought to adjust their beliefs to accommodate inconsistencies or deviations from an expected scenario. To explore the actual processes by which individuals identify inconsistencies, Johnson-Laird, Legrenzi, and Girotto (2004) proposed a model in which inconsistencies are identified when people are unable to accommodate a proposition (an observation or assertion) into an existing mental model. In the mental model, each proposition is considered true. If the observation or assertion encountered is consistent with the mental model, it too is considered true.

Otherwise, an inconsistency is noted. Once the inconsistency is identified, the next step is to change one's belief, and, by doing so, one also must create an explanation that resolves the inconsistency. The process by which explanations are formulated is an area that is still being explored.

Cognitive reasoning skills do not develop purely as a result of exposure to clinical nursing experiences (Kuiper & Pesut, 2004). Strategies that foster development of critical reasoning must be implemented in order to promote its development. It is accepted widely that both cognitive and metacognitive skills are necessary for this development. Even though numerous strategies have been used in nursing education, critical reasoning always does not result. Kuiper and Pesut proposed that self-regulated learning theory, which embraces both cognitive- and metacognitive-skill development, could be an effective method of fostering development of clinical reasoning in nursing education. Reflective clinical reasoning can be fostered through teaching learning activities focused on self-regulated-learning theory. In the self-regulated-learning approach, learners are encouraged to self-monitor through such processes as self-observation of performance, self-judgment of competence, and self-correction of goals. Nursing instruction that makes these processes explicit and values the integration of both cognitive and metacognitive skills can be the most effective method of fostering clinical reasoning in student nurses.

In an exploration of current thought on clinical decision making, pattern recognition, decision-analysis theory, hypothetico-deductive reasoning, and intuition were examined, and a description of appropriate applications of each process

explained (Evans, 2005). With the expansion of nursing autonomy in healthcare, effective clinical decision making is critical. Clinical-decision-making skill particularly is critical in the emergency department as triage nurses must make decisions of care based on a minimum of information. Pattern recognition is essential in generating hypotheses, and, with experience, this type of hypothetico-deductive reasoning can become a subconscious or intuitive process. Clinician's experience is a vital factor in determining which type of decision-making process is used. Evans described four major types of decision making and explains the benefits and limitations of each.

Pattern recognition is used to categorize patients by the similarity of their symptoms to other patients who already have been categorized. The more experience the clinician has had the more similarities will be seen and the better this process becomes. Pattern recognition works well with straightforward clinical cases. Decision-analysis theory breaks decisions down into components that can be evaluated in terms of likelihood and seriousness. Arguments against this theory include the fact that it is not practical in acute situations and that its usefulness depends on the amount of clinician experience. It also might create errors in estimating probabilities. Hypothetico-deductive reasoning uses cues from presenting situations to generate hypotheses about a possible diagnosis. Further cues are then used to confirm or refute the hypothesis. The significance of the cues is then used for final determinations. This method is best used for complex cases. Intuition is the fourth decision-making process reviewed. Intuition is described as an unconscious process based on experience (Evans, 2005). Faculty awareness of the different

cognitive and metacognitive processes used by students is necessary for promotion of enhanced clinical decision making. Nursing faculty can make explicit these processes in nursing instruction and can foster student development of decision-making skills through role modeling and think-aloud analyses of clinical scenarios.

Hammond's Cognitive Continuum Theory (1981) is rooted in cognitive psychology and provides an accessible framework to examine and identify key components of the clinical decision-making process. It is through this transparency that the process can become familiar and also can be taught to novice nursing students. Considered a middle-ground theory, it contains explanations of general and specific relationships between cognition and tasks and also of specific relationships between the nature of a given task and means of cognition. The theory offers a framework for judgment and decision making and has been used in the medical sciences and, currently, in nursing to examine clinical-decision-making processes. Cader, Campbell, and Watson (2004) proposed that there is evidence of the theory as a useful framework for decision making in nursing and other clinical disciplines. Cader et al. stated that, in the current evidence-based practice arena, in which decision-making needs to be transparent and readily explained, the Cognitive Continuum Theory provides an explanation for how nurses use a mix of intuition and analysis depending on the task.

Responding to recommendations promoting the adoption of Hammond's cognitive continuum theory, Harbison (2001) made the case that, although the continuum does allow for a middle ground in nursing theory to be met, it does not include quality of nursing judgment. It does provide, however, a framework for

collaboration across disciplines and leads toward an inclusive multidisciplinary approach toward nursing practice. Hammond's theory is middle ground thus inclusive of many of the polar ends of nursing science.

In order to understand the activity of clinical decision making, nursing science has to draw from a wide array of disciplines, ranging from cognitive and social psychology to philosophy and statistical theories. The cognitive continuum holds its value in potentially bridging existing divisions of nursing theory. Nursing theory that is inclusive rather than exclusive or polarizing is necessary for the advancement of the profession. Hammond's cognitive continuum theory poses a middle ground that allows for cognitive processes spanning analysis and intuition. Nursing science draws from many disciplines thus should be multidisciplinary in its approach. Hammond's theory can provide the framework for this collaboration.

As a cognitive process, clinical decision making is an essential nursing competency. Decision making is a skill that can be learned and the potential for an individual to become an effective decision maker is improved through education and practice (Jenkins, 1985b). Clinical decisions are framed by one's values and assumptions and the existing clinical environment form the framework or context for each decision. Clinical decision making is a cognitive process in which a series of steps are followed to arrive at a conclusive action. Steps in clinical decision making include the search for alternative options, information seeking and assimilation, determination of probable results from each course of action with an evaluation of related risks and benefits, consideration of viable options, and, finally, a selection and implementation of the best alternative (Jenkins). According to Jenkins, although

decision making is often a rational process, there are times when decisions are made without rational deliberation. This assertion fits well with Benner's (1982) novice-to-expert progression of skill acquisition as nurses in the earlier part of the progression are deliberate in their actions but move toward intuition as they gain expertise. Education implications for the development of effective clinical decision making would be for clinical instructors to prompt deliberate clinical decision making through a series of prompts or questions. This technique also has been recommended for the development of clinical judgment and decision making by del Bueno (2005). Providing a learning environment that is open and in which risk taking is rewarded can be conducive for the development of clinical decision making (Jenkins).

Ultimately, once a commitment has been made to integrate clinical decision making in the curriculum, it is the responsibility of the school of nursing to provide as many opportunities for application and practice of decision making as possible. Participation in a academic-service partnership in which there is shared responsibility for student preparation and students are able to complete required clinical rotations in a single setting with a designated nurse preceptors makes student acquisition of effective clinical decision-making skills a distinct reality.

## Theoretical Rationale

This study used the CDMNS to assess nursing students' perceived ability to gather and synthesize data in order to make a clinical decision. Using Benner's (1982) novice-to-expert progression of skill acquisition as the theoretical framework for this study, it was expected that as students gain experience in the clinical setting, they became more competent in making clinical decisions. Benner's theory posits that as

clinical experience increases, students are able to move from deliberate, rule-based decision making to a process in which decisions are made through integration of past experience and newly-presenting information. Essentially, salient clinical features of the new situation are noted and similar past decisions are identified as potential contributors to the decision-making process. Pattern recognition thus contributes to decision making through integration of new data and past experience.

The CDMNS is divided into four subscales that assess students' perceived ability to recognize and assimilate new information while recognizing that the data belong to a larger pattern. This recognition enables the student to make a decision that synthesizes new clinical information with information that has been experienced previously. As the CDMNS was administered to students at the beginning of their first semester-long hospital-based clinical rotation and at the end of this rotation, these nursing students, according to Benner, should have demonstrated improved CDMNS scores across all four subscales over the course of the semester.

To underscore ways in which pedagogical practices and academic-service partnerships can promote advancement to higher competency levels of clinical practice, the theoretical framework on which this study is based should be explained. Benner's (1982) seminal research examining the acquisition of proficiency in nursing provided the theoretical foundation of this study. Using the Dreyfus Model of Skill Acquisition (1980) as a framework, Benner sought to assess if the nursing practice adhered to the competency progression as outlined in the model. The Dreyfus model delineated five levels of proficiency: (a) novice, (b) advanced beginner, (c) competent, (d) proficient, and (e) expert. In order to evaluate if the model applied to

nursing, Benner conducted interviews and performed participant observations with 51 experienced nurse clinicians, 11 new graduate nurses, and 5 senior nursing students. Interviews and observations were performed at six different sites: two community hospitals, two teaching community hospitals, one inner-city teaching hospital, and one university medical center. From the interviews and observations, each level of competency was described as it related to nursing practice. Quotes from participant interviews were included to illustrate clinical experiences and perceptions at each level. Neither the interview questions nor the procedures for participant observation, however, were described. The method for recruiting participants also was not stated explicitly. A major strength of the study, however, was the introduction of a new model of nursing-skill acquisition that allowed practitioners and educators to understand the progression from a task-oriented, rule-based novice nurse to that of an expert nurse who was able to integrate multiple pieces of data and act largely on intuition.

*Instruction Within the Theoretical Framework*

When first beginning a nursing program, students are at the novice stage in the novice-to-expert progression proposed by Benner (1982). They have no experience with clinical situations, thus instruction is by necessity very concrete. Tasks are delineated into elemental steps and are context-free. Students are able to function in the unfamiliar clinical setting as their focus in simply on completing the required tasks. At this stage of competency, students are not able to prioritize tasks or determine when they must deviate from the concrete task in order to best respond to a patient's needs.

Through increased experience in the clinical setting and exposure to different types of scenarios, students move toward the advanced-beginner level. It is at this stage that students begin to understand the salient features of a clinical situation. Prior experience allows for aspect recognition and determination of the appropriate nursing action to take. Instruction at this level of competency can coach student's care by forming guidelines for action that are based on these aspects. As students now have the ability to recognize the important features of clinical scenario, use of aspect-based guidelines is more effective for development of student competency than the instructor simply stating the tasks that need to be completed (Benner, 1982). At this level of competence, however, there is still little ability to prioritize aspects. Each aspect is treated as equally important regardless of the presenting scenario. Both nursing students in the later semesters of a nursing program and new graduate nurses can fall into the advanced-beginner level. Implications for nursing-program-based clinical instruction or new graduate-training programs are that they must include support by competent-level nurses that helps advanced beginners set priorities (Benner). A move from a fragmented viewing of a clinical situation to one that embraces contingencies and reads the situation as a whole reflects the progression of clinical competency from novice to expert. When engaged in problem solving, novice nurses consciously and deliberately consider all elements of the situation, whereas expert nurses read the situation as a whole and are able to target the relevant features of the problem (Benner, 1983).

Although nursing students develop the advanced-beginner level of competency through experience, it follows that recognition of salient features and

prioritization of aspects are skills that can be facilitated by working with a nurse preceptor who functions at least at the competent level. Role modeling on how the nurse preceptor identifies important features of clinical situation, prioritizes assessment findings and actions, and essentially makes clinical decisions are learning activities that are essential to the development of skill acquisition (Benner, 1982). Although still at the novice stage, nursing students conceivably can engage in this form of role modeling from the first or second semester of their nursing program. Early exposure and experience with this kind of nursing potentially can enable students to move through the progression of novice to advanced-beginner level of clinical competency in a more rapid manner, culminating in a better-prepared new graduate nurse.

## Research Questions

There are two major research questions and nine minor research questions. The major research questions are as follows:

1. To what extent is there a change in Clinical Decision Making in Nursing Scale (CDMNS) scores from pretest to posttest after student participation in a residency-based clinical course?
2. To what extent is there a difference in CDMNS change scores for students in a residency-based clinical course and students in a traditional instructor- focused clinical course?

The minor research questions are as follows:

1. To what extent is there a difference in the CDMNS Subscale A (Search for Alternatives or Options) change scores for students in a

residency-based clinical course and students in a traditional instructor-focused clinical course?

2. To what extent is there a difference in the CDMNS Subscale B (Canvassing of Objectives and Values) change scores for students in a residency-based clinical course and students in a traditional instructor-focused clinical course?

3. To what extent is there a difference in the CDMNS Subscale C (Evaluation and Reevaluation of Consequences) change scores for students in a residency-based clinical course and students in a traditional instructor-focused clinical course?

4. To what extent is there a difference in the CDMNS Subscale D (Search for Information and Unbiased Assimilation of New Information) change scores for students in a residency-based clinical course and students in a traditional instructor-focused clinical course?

5. To what extent do nursing students participating in the residency-based clinical education model and in a traditional instructor-focused program differ in their satisfaction with the experience?

6. To what extent is there a relationship between age and student change scores on the CDMNS and CDMNS subscales?

7. To what extent is there a relationship between amount of clinical experience outside of nursing school and student change scores on the CDMNS and CDMNS subscales?

8. To what extent is there a difference between student ratings of the instructor in the traditional clinical course and the student ratings of the preceptors in the residency-based clinical course?

## Significance of the Problem

Effective clinical decision making is an essential skill for nurses at all levels of clinical proficiency to possess. Regardless of lack of clinical nursing experience, new graduate nurses need to be able to function as safe and competent clinicians as soon as they begin providing care for patients, and decision-making ability is a defining aspect of their care. The onus is on nursing education to prepare new graduate nurses to meet the demands of the current health-care system. Development of clinical-decision-making competencies is a vital part of this preparation. New pedagogical approaches toward clinical education are attempting to enhance development of decision-making skill in nursing students. With an aim toward developing educational strategies to better prepare new graduate nursing students, this study investigated the effects of a residency-based approach in clinical education on nursing students' perceptions of their clinical decision-making abilities.

## Definition of Terms

There may be more than one way to define the terms below, but the definition given is the one that will be used in the dissertation.

*Clinical decision making:* A conscious, cognitive sense of how an individual engages in making decisions (Jenkins, 1985a). Decisions made in the clinical setting that directly affect patient outcomes and the ability of the health care team to function effectively.

*Clinical Decision Making in Nursing Scale (CDMNS):* A research tool developed by Jenkins (1985a) to measure perceptions of clinical decision making in nurses. The tool was used initially to guide instruction of clinical decision making to nursing students. The CDMNS has four subscales: (a) search for alternatives or options, (b) canvassing of objectives and values, (c) analysis of consequences, and (d) search for information and unbiased assimilation of new information.

*Clinical experience:* A challenge, refinement, or refutation of preconceived notions through interaction with an actual clinical situation (Benner, 1983). Clinical experience is a subjective experience unique to the student and occurs through engagement in clinical nursing education.

*Instructor-based clinical education:* Also referred to as the traditional model of clinical education. An instructional model in which one nurse faculty instructs and supervises a group of approximately 10 nursing students in the clinical setting (Roche, 2002). Students work with different nurses for each shift on the unit and move among different healthcare institutions during the nursing program.

*New graduate nurse:* Nurses entering clinical nursing practice for the first time after completing a nursing program. The new graduate nurse is defined in opposition to del Bueno's (2005) characterization of "experienced" nurses who have engaged in at least one active year of clinical nursing.

*Preceptor:* A working registered nurse who by working in tandem with a nursing student in the clinical setting instructs the student in the nursing process as

applied to authentic nursing duties and responsibilities (Myrick & Yonge, 2004). Preceptor training to work with students is inconsistent as preceptors receive varying levels of support, ranging from no preparation to comprehensive training.

*Preceptor-based clinical education:* A clinical education model in which students are paired with a unit-based staff nurse usually for the duration of a one-semester clinical practicum. This model also has been called the Clinical Educator Model (Roche, 2002).

*Residency-based clinical education:* An innovative clinical education approach in which nursing students are placed in one health-care facility for the duration of the nursing program and partnered with a nurse preceptor in a different practice unit every semester.

## Forecast of the Study

To facilitate an understanding of the organization of the study, an introductory chapter (present chapter) is included that presents the background and need of residency-based clinical education. Chapter II, the Review of the Literature, explores clinical decision making in nursing, innovations in clinical nursing education, existing residency-based clinical teaching programs, and research on preceptor-focused clinical education. The research design, general characteristics of the study sample, the development and pretesting of the instruments, and methods of data analysis used to address the research questions are described in Chapter III, Methodology. The results of the data analysis are reported in Chapter IV. Chapter V includes a summary of the research, a discussion of study limitations and a discussion of the results.

Research findings are linked to previous research on clinical decision making and the major theoretical framework in this area of study. Chapter V also includes implications and recommendations for future research and for clinical practice.

# CHAPTER II

## REVIEW OF THE LITERATURE

A residency-based approach to clinical learning is not a novel pedagogy. Disciplines such as occupational therapy, physical therapy, and medicine use this approach to prepare practitioners for patient care. The nursing profession historically used residency-based clinical education but changed to a rotation schedule of clinical sites once preparation moved from a hospital-based environment to one that was university based. Now, however, in attempt to address the need for better prepared nurses at graduation, the nursing profession has begun to look again to using a residency-based approach in which students remain in one hospital setting for the duration of their clinical rotations.

The purpose of this study was to compare the clinical decision-making competencies of students trained in the residency-based clinical teaching approach with students who are prepared using the traditional instructor-led clinical group after completion of a one-semester clinical course. The review of the literature will provide a foundation of research to support the residency-based clinical teaching approach in nursing. This literature review is divided into four sections. Section one explores clinical decision making in nursing and includes identification of thinking processes inherent in decision making, factors that promote effective decision making, and assessment of clinical-decision-making competencies. Section two introduces innovations in clinical nursing education and presents research on novel pedagogical approaches in clinical instruction and collaborative partnerships between academia and service. Section three examines existing residency-based clinical

teaching programs. Finally, section four presents research on preceptor-focused clinical education and focuses on the benefits of the preceptored experience, positive preceptor behaviors, preceptor preparation, and the clinical-education triad consisting of the preceptor, student, and faculty member.

## Clinical Decision Making in Nursing

A main goal of using a residency-based clinical-education model as opposed to the group-environment clinical-instructor-led clinical model is to foster decision-making competencies in nursing students (Roche, 2002). By working one-on-one with a preceptor, students are expected to assume all nursing competencies, albeit in a graduated manner. Clinical-decision-making skill is the foundation of safe and effective nursing care and an awareness of its critical role can encourage its development even in the novice nursing student (Jenkins, 1985b). This section will identify thinking processes inherent in clinical decision making, factors that promote effective decision making, and assessment of clinical-decision-making competencies.

### *Thinking Processes Inherent in Decision Making*

In order to provide an understanding of the nursing outcomes examined in this study, there must first be an examination of thinking process used in clinical decision making. Using a qualitative approach based on participant observation, Manias, Aitken, and Dunning (2004) sought to study graduate nurses' decision-making models when administering medication to patients on a busy medical-surgical floor. Graduate nurses were defined as nurses who were in their first year of licensed clinical practice after completing a 3-year nursing program. Twelve graduate nursing students providing direct patient care participated in the study. Participants were

observed over a 2-hour time period during medication administration to patients. Interviews also were conducted with the participants to obtain further information about their decision-making processes during medication administration. Interviews were coded by the researchers, and the results showed that the nurses most often used hypothetico-deductive reasoning (observed 25 times), followed by pattern recognition (observed 10 times), and then intuition (observed 2 times). Physical assessment was determined to be a key consideration of the decision-making process. The findings also showed that the nurses sought assistance from more experienced nurses and physicians if they had questions about treatment. The researchers pointed out that health-care environments in the 21st century are complex and ever changing and require nurses to make clinical decisions that by necessity must include contextual influences.

Identifying and understanding the driving forces behind clinical decision making when performed by new nurse graduates is critical for nurse educators. Teaching-learning strategies can be focused on ways to foster cognitive processes that contribute to effective clinical decision making. This study of new graduates is especially relevant as the participants are considered to be at the novice or advanced-beginner stage of skill acquisition as defined by Benner (1982) and thus are still very similar to nursing students in level of clinical competence.

Clinical decision making in nursing practice historically has been studied using primarily think-aloud protocols in simulated patient situations. These simulated experiences are not time limited and thus do not reflect accurately the urgency of care in a typical nursing environment. Higuchi and Donald (2002) attempted to study

clinical decision making in an authentic clinical environment. Out of 15 volunteer medical and surgical nurses working in a community hospital, 8 were selected to participate in the study. Nursing notes contained in patient charts were reviewed for three types of information: (a) statements that identified problem situations, (b) previously documented problem situations, and (c) nursing actions. Higuchi and Donald also investigated the specificity of the nursing intervention in their analysis. The content of the nursing notes was then coded into five nursing processes that included description, selection, inference, synthesis, and verification. They found that description was used in 100% of surgical nursing notes and 79% of medical notes. Selection was evident in 69% of medical notes and 88% of surgical notes. Inference could be found in 58% of surgical and 33% of medical notes. Synthesis was seen in 48% of medical and 20% of surgical notes. Finally, evidence of verification was found in 36% of medical and 8% of surgical notes. In the discussion, Higuchi and Donald elaborated on the value explicit analysis of clinical decision making has for nursing practice, one of which was experienced nurses being able to model effectively thinking processes for new graduates and nursing students working on the units. From the results, it is evident that explicit discussion of thinking processes in an authentic clinical environment is more valuable to nursing education than simulated patient situations. Nursing education also can use the study results to provide a decision-making framework that can help guide novice students.

Ritter (2003) used a qualitative design to examine the diagnostic reasoning of nurse practitioners (NP). Ten nurse practitioners who met the inclusion criteria for expert-level practice participated in the study. Inclusion criteria were comprised of

(a) at least 3 years of experience as an NP, (b) master's degree or higher in nursing, (c) current NP licensure, and (d) clinical leadership or experience as a lecturer to professional groups. It is not clear how the NPs were recruited except that they voluntarily participated in the study. To assess diagnostic reasoning, participants were administered two common but complex case studies that had been reviewed by a panel of seven expert NPs for content validity. The researchers did not discuss how members of this panel were selected. Participants were instructed to work through the case studies and explain the rationale for their decisions by thinking aloud. The think-aloud was tape recorded and transcribed for further content analysis.

Components of two models of decision making, the Information Processing Model (IP) and the Hermeneutical Model (H), were used to guide coding. A thorough discussion of the development and past application of each model was included in the review of literature to give context to the theoretical frameworks used. It is not stated clearly who performed the coding, but the researchers do report that to establish interrater reliability, every third transcript was reviewed by a second independent NP. The resulting interrater agreement was 100% (Ritter, 2003). Data from the transcripts were coded generating frequencies and percentages for the components of each model and for individual participants and the group as a whole. By using the two models as frameworks for analysis, the researchers were able to demonstrate findings that were analyzed systematically and presented, thus allowing for a relatively clear and uncomplicated application in clinical education.

Results showed that 99% of participant responses were explained by the two models of decision making: IP and H. The IP was discovered to describe 732, or 55%

of observed themes, and the H model accounted for 589, or 45% of themes. Themes were delineated by the identified components of each of the models with the four highest percentages of occurring themes being gathering facts (32%), generating the hypothesis (11%), confirming the hypothesis (10%), and skilled know-how (25%). The first three themes were part of the IP model, and the remaining theme was a component of the H model. An important finding from this study was that expert nurse practitioners do not adhere exclusively to one model of decision making but draw from both to provided safe and competent patient care. In support of the use of preceptors, the researchers also included a statement extolling the value of preceptors in nurse-practitioner education. The educational implications for awareness of decision-making models should be made explicit in training courses and included in didactic material and preceptor handbooks. In this way, the processes behind decision making and problem solving can be explained and role modeled in their component parts for the novice nurse practitioner by the clinical instructor or preceptor. This study contributed to the growing awareness of the need for making methods of decision making clear to clinical students and newly practicing nurses and nurse practitioners thus allowing for more effective clinical preparation.

Through exploration of other disciplines, it is evident that the process behind clinical reasoning is a pervasive topic of research. As nursing is multidisciplinary by nature, it is appropriate to draw from the literature of other domains to create learning environments that foster effective clinical decision making. Plummer, Morris, Denisenko, and Dunai (2005) explored clinical-decision-making processes used by physiotherapists (PTs) when performing assessments on stroke patients with

unilateral neglect. Fourteen neurological PTs comprising 12 women and 2 men participated in the study; how they were recruited is unknown. Methodology consisted of use of a videotape presentation of an experienced PT assessing a stroke patient with left unilateral neglect; whether they were shown the videotapes individually or in a group environment is unknown. If the presentation were done in a group setting, a concern would be members of the group might influence each other's thoughts and perceptions. Periodically during the video, the tape was paused, and the participants were asked to record their thoughts about the patient at that moment in time. At the end of the video presentation, the participants were questioned further about clinical decisions and also were asked to diagnose the patient's behavior using a glossary of diagnoses. Through analysis of participants' responses, Plummer et al. found that the PTs used both pattern recognition (forward reasoning) and hypothetico-deductive (backward reasoning) models of clinical reasoning. For example, to determine evidence of pattern recognition, the researchers noted that PTs responded to cues in the background medical data in order to generate and evaluate hypotheses. That different types of clinical reasoning or decision making were found to be used in clinical practice supports the notion of clinical faculty who are (a) aware of differences in student decision-making style and (b) well-versed in pedagogical approaches rooted in the understanding of clinical-decision-making theory that help promote decision making.

Hypotheses about the clinical presentation of unilateral neglect were devised by each participant in the early phase of the assessment and were not changed significantly by the majority of participants even with the introduction of new

information. The type of neglect was not observed to be considered in the decision-making process until participants were provided with the diagnosis glossary. Having the glossary allowed for more accurate characterization of neglect behavior, indicating that education may increase clinical reasoning ability of the PTs.

The findings have many implications for nursing education; mainly that in a clinical environment, students use multiple forms of decision-making processes and that instructors can help guide or role model these processes. Additionally, a knowledge set, demonstrated by the use of the glossary in this study, was shown to be effective in helping student identify and define the clinical presentation of a given case. Awareness of the cognitive components of clinical decision making is only a first step in understanding how students make decisions surrounding patient care, however. In order to promote effectively development of decision-making competencies in nursing students, pedagogical factors that enhance decision making in the clinical setting must be explored.

*Factors Promoting Effective Clinical Decision Making*

In order to identify factors that enhance clinical decision making in nursing, Hagbaghery, Salsali, and Ahmadi (2004) used a qualitative, grounded theory approach looking at interactional processes between members of different healthcare teams. Twenty-six nurses of varying levels in professional rank of four large public hospitals comprised the sample. Twelve of these nurses were staff nurses, 12 were head nurses, and 2 were nursing supervisors. Interviews were conducted with each participant in a private room 2 to 3 hours after their shift had started as workload typically decreased in this time period. Interviews were semistructured with

interviewers taking notes and revisiting topics for more clarification if necessary. Interviews included such questions as, "In your opinion, what factors facilitate or inhibit effective clinical decision-making in nursing? Explain some of your experiences in which you have made decisions which you think were effective for your patients or in the practice environment" (Hagbaghery et al., p. 2). Twelve sessions of observation in which the main primary researcher focused on participant interaction with colleagues and patients also were carried out. Particular attention was paid to the nurses' decisions surrounding patient care and the care environment. From the interviews and observations categories emerged, and several key informants were interviewed. Key informants comprised three nurse managers, three nurse trainers, three senior nursing directors, two doctors who were the medical directors of two of the hospitals, and a member of a newly established national nursing organization.

Data analysis was conducted by the researchers along with data collection as dictated by grounded theory. Transcripts were reviewed several times, and coding was used to identify themes. As a result of this method, categories emerged during data collection that allowed the researchers to further pursue interview participants such as with the inclusion of key informants. Five major themes positively impacting clinical decision making emerged from the data: (a) feeling competent in the clinical setting, (b) being self-confident, (c) organizational structure supporting nurses' authority to make decisions, (d) being supported by management, and (e) nursing education. This last theme was commented on extensively by nursing staff and nurse administrators. The majority of participants indicated that clinical decision making

was not taught effectively in nursing education, that there was little opportunity to apply theory to practice, and that the curriculum emphasized rote knowledge instead of decision-making skills.

From the results, the researchers formed a model that emphasized the interrelationship of internal and external variables to clinical-decision-making competence. Internal variables consisted of self-confidence and feeling competent. These internal variables must be bounded by the external variables nursing education and being supported in order for nurses to make safe and effective decisions successfully in the clinical setting. The findings also herald a call to nursing education to emphasize decision-making skill and to provide opportunities for this skill to develop.

White (2003) carried out an interpretive study to examine how fourth-year nursing students learned clinical decision making. The sample was comprised of 17 fourth-year nursing students between the ages of 21 and 37 who were completing the final semester of a baccalaureate program. The researchers used Heideggerian phenomenology and hermeneutical analysis in order to understand the experiences of the nursing students they interviewed. These approaches were used, as it is believed that clinical decision making is couched in everyday nursing student clinical experience. Interviews were audiotaped and interpreted using a seven-step hermeneutic interpretive process developed by Diekelmann and Allen. Data were coded, and five main themes emerged: "gaining confidence in their skills, building relationships with staff, connecting with patients, gaining comfort in self as a nurse, and understanding the clinical picture" (White, p. 115). A constant-comparative

method was used to identify themes. This method involves the shifting of the researcher's focus between identified parts of the data and the whole data. The constant-comparative method ensures interpretation of the parts as they relate to the whole experience conveyed by each of the participants. After completion of the constant comparative method, three students were asked to verify the themes.

A number of critical points arose from the results; two of which have profound implications for clinical preparation of nursing students. The first point that was evident was the importance of staff nurses in the development of students' clinical decision-making skill and the inherent tension that comes from staff nurse clinical responsibilities on the hospital floor and simultaneously having to guide and instruct a nursing student. A second point was how consistency in the clinical environment supports student learning. Student learning, when students are being introduced continually to a new hospital or hospital floor, is more often focused on learning the unit than learning about the patients and nursing care. The findings create support for the residency model of clinical education in which students stay in one hospital for the duration of their clinical rotations thus minimizing the time the students spend learning a new clinical setting.

Hoffman, Donoghue, and Duffield (2004) also looked at factors contributing to clinical decision making. The researchers used a correlational study design to investigate the relationship between clinical decision making and role value, educational level, experience, level of appointment, area of clinical practice, and frequency of decision making. Role value was assessed using an occupation orientation scale that looked at professional, para-medical, and bureaucratic ideology.

Sample items would be whether the profession of nursing or the organization for which someone worked should define nursing duties. Educational level was assessed through collection of participant demographics and ranged from hospital certificate to postgraduate diploma. Experience was assessed through participant-reported years of experience. Level of appointment also was collected through participant demographic data and included registered nurse, clinical nurse specialist, clinical nurse consultant, or nurse unit manager. Area of practice was defined by the type of hospital unit on which participants worked and included either the medical or surgical unit. Finally, frequency of decision making was assessed using a decision-making inventory that included 23 items for perceived decision making and 23 items for normative decision making or decisions nurses say they would like to make. The scale used a 5-point Likert ranging from strongly agree to strongly disagree for each item.

A stepwise regression was performed to weight the importance of each factor in the overall decision-making process. Participants consisted of a convenience sample of all nurses working on a medical-surgical floor in two public hospitals and one teaching hospital. Results from the decision-making instrument consisting of 46-item, 5-point Likert scale questionnaire assessing both perceived and normative factors in decision making were analyzed. The Cronbach's coefficient alpha computed for the perceived scale was .74 and for the normative scale was .75. One hundred and seventy-four nurses were given questionnaires, although only 96 were returned. The researchers defined clinical decision making as decisions nurses undertake in everyday clinical practice.

Data analysis showed that, in contrast to previous studies, no statistically significant correlation between education level or experience and perceived decision making existed. There were, however, statistically significant relationships at the .05 level but weak correlations between professional orientation-role value and perceived decision making (r = .33), level of appointment and perceived decision making (r = .34), and age and perceived decision making (r = .22). There was a statistically significant but weak inverse correlation between area of clinical practice and perceived decision making (r = -.31). The results of the stepwise regression showed that professional values and level of appointment each accounted for 10% of the variability in decision making. Area of practice accounted for 8.5%, and age accounted for 3.9% of variability in decision making. The adjusted $R^2$ for the four variables accounted for 24% of the variability in decision making, indicating that both level of appointment, a rank based on experience and professional values, a quality that faculty can work to instill in nursing students, were influential in decision making. Area of practice also contributed to the variability of decision making indicating that the complexity of patient situations in a given unit may influence decision making. To a lesser extent, age was also a factor in frequency of decision making pointing to the possibility that greater length of experience with recognition of salient situational features and the subsequent decision-making process may influence clinical decision making. The relationship between greater age and increased frequency of clinical decision making, however, was low (Hoffman et al., 2004).

Although the study used multiple regression to investigate a priority list of decision-making factors, the regression analysis lacked statistical conclusion validity due to the small sample size and low power. The findings of the multiple regression, however, are in contrast to the major themes in the literature that state that both age and experience contribute to decision making. The researchers recommended that the study be repeated with a larger sample size to explore fully the relationship between clinical decision making and perceived and normative factors. Following from the examination of factors that contribute to clinical decision making, it is necessary to explore ways in which decision-making competencies are assessed.

*Assessment of Clinical-Decision-Making Competencies*

Although a discussion of factors that contribute to clinical decision making is essential in guiding appropriate instructional approaches, measurement of the efficacy of these educational interventions also must be a part of the development of effective clinical decision making. The following section presents research that assesses perceptions of clinical-decision-making competencies.

Roche (2002) explored clinical decision making in senior baccalaureate students from two nursing programs participating in a pilot study investigating different methods of clinical education. One method of clinical teaching used the traditional model of a faculty instructor who provides supervision for up to 10 students practicing patient-care skills. The second method, the Clinical Educator Model, paired unit-based staff nurses, identified as expert clinicians, with nursing students. The expert staff nurses, or clinical educators, were prepared for their role through a one-day workshop conducted by university faculty that included

information on the Clinical Educator Model, learning environments, and teaching strategies in the clinical setting. Students were assigned to work with one clinical educator for 12 hours per week for 12 weeks. The pilot study took place during the students' senior-year medical surgical rotation. Using a quasi-experimental design, a convenience sample of 50 students (25 in each group) participated in the pilot study. The method by which each group was selected for either the traditional or Clinical Educator Model was not explained.

Each group was administered the *Assessing Nursing Practice: Medical-Surgical Problems* (1992), an instrument developed by the National League for Nursing (NLN) Test Service to measure clinical decision making. The instrument contains a written simulation of an RN assignment of four medical-surgical patients and then individuals respond to 11 open-ended questions concentrating on nursing activities for that assignment. The questions address such content areas as data assessment, outcome evaluation, and choosing and stating rationales for actions (Roche, 2002). Scoring was performed using the norm-referenced guide developed by the NLN Test Service. To establish interrater reliability, a random 10% of the examinations were scored by the researcher and an alternate scorer. Interrater reliability was calculated at .93 for this sample. Data on student age, gender, previous education, and type and extent of previous nursing-related work also were collected.

Results show that students in the Clinical Educator group scored statistically significantly higher (mean = 30.1), on average, on the NLN instrument than students in the traditional clinical education model (mean = 27.0). The demographic data of the sample did not differ statistically significantly from the NLN profile of new

graduate nurses (Roche, 2002). The traditional group was older (mean age = 29.2) than the Clinical Educator group (mean age = 25.8), and there was a statistically significant weak negative correlation between age and clinical decision making (r = -.33). The correlation between amount of nursing-related work and clinical decision making was not found to be statistically significant (r = .11; Roche). In the discussion, the researcher posited that an explanation for the increased decision-making capabilities of the Clinical Educator group could be that students who work one-on-one with an expert nurse clinician may have the opportunity for more clinical experiences and more feedback than students participating in a traditional model of one-instructor per group of 10 students. Additionally, the relationship developed between the student and clinical educator can promote learning about how nurses problem solve and make decisions.

Limitations of the study included no pretest data on student clinical-decision-making ability. The student groups were recruited from two different nursing programs, and it is not known how or to what extent the groups differed prior to participation in the study. Furthermore, proper interpretation of student responses to the open-ended questions of the NLN instrument used to assess clinical-decision-making ability requires considerable judgment on the part of the scorer (NLN, 1992). This judgment introduces the potential for subjectivity in the assessment of student clinical-decision-making ability when using the NLN instrument.

Girot (2000) conducted a quasi-experimental, between-subjects study that evaluated critical thinking and perceived clinical-decision-making skills across nursing students in four stages of a nursing preparation and practice. The sample was

comprised of a convenience sample of 82 student nurses: (a) a comparison group of 32 first-year undergraduate students were used for baseline assessment, (b) 19 students from the final year of a nursing program, (c) 17 graduate practitioners who recently had completed a postregistration degree program, and (d) a group of 15 experienced practitioners who were completing a study-skills program. To assess critical thinking, the Watson-Glaser Critical Thinking Appraisal was used. The appraisal contains 80 items across five subscales: inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments (p. 290), although this study limited participant completion to the inference scale. Participants were asked to evaluate how appropriate each proposition was, although it was not clear on what type of scale the proposition was rated. The Jenkins Clinical Decision Making in Nursing Scale (CDMNS) was used to assess perceived clinical decision-making ability. The CDMNS is comprised of 40 items across four subscales: (a) search of alternative options, (b) canvassing of objectives and values, (c) evaluation and re-evaluation of consequences, and (d) search for information (p. 290). After administration of each tool, a correlation was performed in order to investigate whether a relationship existed between critical thinking and clinical decision making.

A series of one-way analyses of variance and Scheffé's posthoc test was computed to identify differences. Findings showed that for across the four groups there were no statistically significant differences in critical-thinking ability ($F_{3,78}$ = 1.37). There were, however, statistically significant differences in perceived decision-making ability between those at an early stage in their academic and practice experience as compared with those who had been practicing and had pursued

graduate education ($F_{2,201} = 17.71$, $eta^2 = .15$) indicating that 15% of variability in the perceived decision-making abilities was explained by greater clinical practice experience and education. According to Cohen (1992), $eta^2$ of .02 is a small effect, .15 is a medium effect, and .35 is a large effect. The differences in perceived decision-making ability were attributed to academic preparation, although it is conceivable that decision-making skill also can come from clinical experience. Based upon Scheffé's posthoc test, statistically significant differences were found to occur between the "nonacademics" and both the 4th-year students and the experienced graduates (Girot, 2000). There were, however, no statistically significant differences between the 4th-year students and the mature graduate practitioners who had completed successfully nursing education to the graduate level and had many years of clinical practice experience. This finding suggests that nursing students and nurses exposed to the academic process have more enhanced decision-making capabilities compared with those who have not. Regarding correlation analysis, findings suggested that, contrary to the prevailing belief in nursing education, there is no relationship between critical thinking and decision making in practice ($r = -.01$, $n = 35$).

In summary, the literature looking at decision making in the clinical environment has been reviewed, and a number of critical elements of the clinical decision-making process have been identified. Benner's (1992) theoretical framework of novice to expert has been used to link proficiency with the decision-making process with advancement of skill acquisition in the field of nursing. Knowing that increased ability in clinical decision making leads to progression of

clinicians from novice to expert, it is imperative that nursing education prepare nursing students to have effective clinical judgment and to know how continually to improve their own clinical decision-making competencies. Nursing curriculums must contain more than content-driven curricula. Metacognitive strategies that encourage students to reflect on their own abilities and on ways in which they best learn should be emphasized in order to facilitate life-long professional development.

## Innovations in Clinical Nursing Education

Nursing education needs to evolve constantly in order to reflect the needs of the clinical environment (American Association of Colleges of Nursing [AACN], 2003). Novel pedagogical approaches are being developed continually and implemented by various schools of nursing in order to meet this need. There is also a move toward creating partnerships between academia and service in which schools of nursing form a strategic alliance with a hospital or health-care consortium to establish an education-practice link. The following section reviews research focusing on evaluation of new approaches to clinical education.

### *Novel Pedagogical Approaches in Clinical Instruction*

Ben-zur, Yagil, and Spitzer (1999) investigated an innovative nursing curriculum carried out in the first 2 years of an undergraduate nursing program. Two studies were performed within the larger overall study; the first examining the student perceptions of program congruency with the current needs of health care, and the second looking at registered nurse perceptions of the adequacy of program preparation for professional practice and an ideal curriculum to prepare student nurses for practice. The curriculum was revised by faculty in response to a growing

awareness of enormous paradigm shifts in the healthcare profession and the inability of current strategies to address effectively problems within the discipline. The innovative curriculum was structured around managerial competencies of new graduate nurses as opposed to the current model of sole emphasis on clinical competency. Among the new skill sets students were expected to derive from the innovative curriculum were entrepreneurship, change management, strategic thinking, and budgeting (Ben-zur et al.).

The first study included a sample of 65 first-year and 25 second-year students. Mean age was 21.68 years with a range of 18 to 28 years of age. Questionnaires were administered to the students in class at the end of the academic year. Although not explicitly stated, the perceptions of students were assessed in order to explore student understanding of critical issues in health care that had been integrated into their nursing education to date. The instrument consisted of 21 bipolar existing curricular components that students rated either conservative or innovative on a 6-point scale. Conservative curricular components included those that were teacher-centered and not reflective of changes in health care such as the move toward community-based education, health and prevention, primary care, and the whole-person approach. Conversely, innovative components included those that prepared students for nursing care in the current healthcare environment. Students then received a second questionnaire where they rated an ideal curriculum on the same 21 items. Frequencies were used for item response. Findings were not discussed clearly, but it was evident that the existing curriculum was considered similar to the ideal with regard to the changing needs of the healthcare system.

The second study within the larger study conducted by Ben-zur et al. (1999), which looked at registered-nurse perception of the curriculum of nursing programs they graduated from as opposed to that of an ideal curriculum, was carried out to help with the interpretation of student perceptions. The sample consisted of 105 registered nurses who had 2 to 32 years of nursing experience. The mean age was 33.25 years of age with a range of 23 to 55 years of age. The same questionnaire filled out by the students was used for the registered-nurse sample, and the identical data analysis was performed. Results showed that the curricula of the programs that had prepared the registered nurse for practice were perceived as conservative in their pedagogical approach thus not preparing nurses to practice adequately in the current healthcare environment. Ratings for the ideal curriculum tended toward the innovative side of the scale. When comparing results from the two samples, it was found that both students and registered nurses rated the ideal curriculum as more innovative. It also was found that students rated their existing curriculum as more innovative and able to meet the needs of the current healthcare environment. The researchers accurately concluded that the current curriculum is innovative and appropriate for preparation of nursing students. A strength of the study design was that it allowed validation of student perceptions by experienced nurses who were familiar with the needs of practice. A weakness was the lack of clarity in the description of data analysis and results. In addition, the study was carried out in Israel so generalizability to a broader population is questionable.

*Collaborative Partnerships Between Academia and Service*

Looking to address the current shortage of available nursing staff and the impending crisis of a shortfall of over one million nurses by 2020, Woods and Craig (2005) investigated the issues of retention and performance among new graduate nurses and the role of academic-service partnerships in better preparing these nurses. The purpose of the study was to measure retention of new graduate nurses, to examine variables influencing successful transition into practice, and to evaluate the effectiveness of performance evaluation instruments used to differentiate new graduate performance at 3 and 12 months and by academic program. Data were gathered retrospectively from personnel records of 100 nurses using an 18-item structured coding instrument that included such variables as demographic factors, academic program completed, pervious healthcare experience, participation in the institution's internship program, transfers and terminations within the first year, and performance strengths and opportunities (Woods & Craig).

Trends identified by data analysis showed that new graduates who had previous work experience in health care had greater retention rates (94%) than those who did not (85%; Woods & Craig, 2005). This finding suggests that nursing students should be encouraged to seek internships or other part-time hospital work while still in nursing school. Faculty thought their own associations to service could be instrumental in connecting students to these positions. With regard to learning opportunities, it was found that healthcare organizations could increase accessibility to hospital work by structuring summer internship experiences and flexible shift work that allowed for family and school commitments. A statistically significant difference

was found in retention rates between students hired from baccalaureate degree programs (84%) versus associate degree programs (96%; Woods & Craig). The investigators pointed to a number of possible explanations for the findings including age differences and the fact that associate degree students spend a greater number of hours in the hospital setting in which they work on basic skills perhaps allowing for greater confidence upon entry to practice. Another finding showed that participation in an institutional internship program was indicative of greater retention. There was a retention rate of 92.4% for new graduates who attended a program versus those who did not (88%; Woods & Craig). One factor that may contribute to this discrepancy in retention is the function of internships in facilitating adjustment to the role of professional nurse. When looking at the tools used for performance evaluation, there were no clear data indicating trends of better preparation by type of academic program or specific academic institution. At the institution where the study was conducted, the performance evaluation tools used to assess new graduates where the same as those used to assess experienced nurses. A recommendation would be to develop tools that specifically look at the competencies of new graduate nurses and to have nurse managers become proficient with the tools.

As a result of the findings from the study, a recommendation was made for the creation of stronger and more sustained partnerships between academic and healthcare organizations in the preparation and transition of new graduate nurses. Currently, there is little discussion between these two types of organizations yet they both have a common goal: to ensure a supply of safe and competent professional nurses. By establishing partnerships, a continuous dialogue linking curriculum issues

and performance data of nurses in their first year of practice could become part of the expectation of professional nursing preparation and evaluation.

In an attempt to address the educational challenges of teaching larger numbers of nursing students per clinical group (n=15) while improving learner outcomes and levels of patient care, as well as cost-effectiveness, a clinical collaborative model was developed by a university on the West coast (Close, Koshar, & DelCarlo, 2000). Within the clinical model, an expert baccalaureate-prepared practicing nurse is matched with an expert-nurse faculty to function as a collaborative teaching team in the acute-care setting. The nurse expert is given the title Assistant Clinical Instructor (ACI) and paid by the university for hours of clinical instruction and supervision outside of his or her regular work hours. During the time the ACI is instructing a clinical section on the hospital floor, the ACI is considered an employee of the university and thus his or her primary job responsibility is instruction not patient care. The faculty member also is responsible for clinical instruction but for only a portion of the clinical day (the final hour of direct patient care and one hour to facilitate postconference) thus allowing time for completion of other faculty duties such as research and teaching of theory. Responsibility for student supervision and evaluation is shared by the ACI and the nurse faculty, and they work collaboratively to ensure that students are meeting their learning objectives.

Evaluation data for the clinical collaboration model were obtained from the participating students, the ACI, faculty member, and university and hospital administrators. Financially, the model was successful in reducing three clinical sections of 10 students to two clinical sections of 15 students. The folding of three

clinical sections into two reduced the overall cost for clinical instructors by one. In addition, the faculty member was allowed to utilize her workload units in other areas of the curriculum resulting in a savings to the department. According to Close et al. (2000), the model allowed for savings of costs associated with part-time faculty and allows for better use of the education and expertise of full-time faculty. Students expressed a high level of satisfaction with the clinical experience (mean = 4.67 on a 5-point Likert scale). Students valued the clinical expertise of the ACI and the faculty member's knowledge of the health-care issues of the patient population. The ACI appreciated the collegial relationship formed with the faculty member and the ability to function solely as a clinical instructor when working with students rather than having to juggle patient care and instruction. The faculty member valued the time the model allowed her to spend with students and patients as she was not the only clinical instructor for the entire group of students. That she did not have to spend 2 full days per week in the clinical setting also allowed her to become more involved in university roles. Finally, although initial hesitancy existed, both the university and hospital administrators found the model to be beneficial. The university's fears of financial burden were allayed by analysis of the replacement costs of a baccalaureate-prepared clinical instructor versus a doctorally prepared faculty member. The study does not state clearly the benefits identified by the hospital administrators.

The collaboration between academia and service, as explored by this study, can be a successful endeavor for all participants. A collaborative clinical model in which an expert clinical nurse, who is practicing at the bedside, is paired with an

expert nurse faculty, who has a deep understanding of population-specific health issues, is an innovative and effective response to the shortage of nurses, nursing faculty, and greater expectations of competency of nurses entering clinical practice. The evaluation data for this clinical model only reflected the experiences of one ACI, one faculty member, and two groups of students, thus the results are not generalizable to a larger population. The data, however, are promising and support future attempts at partnering academia and service in the area of clinical education.

In summary, this section contains the reviewed literature regarding innovative nursing curricula. The response of academia to the rapidly-changing healthcare environment through the implementation of novel pedagogical methods demonstrates the recognition and willingness by the profession to produce and retain safe and competent nursing-care providers. As discussed, the skill set required for nurses of the 21st century expand beyond basic bedside care. Knowledge of how to deliver care in a complex, and often chaotic, environment and the acquisition of interdisciplinary skills that encompass awareness of budget and management are essential nursing competencies. New methods in which to best teach these skills are being adopted by nursing programs on both a national and international level. One approach that that is being used to foster development of metacognitive and management skills in nursing students is the residency-based model of clinical education.

## Existing Residency-based Clinical-Teaching Programs

One key strategy in forming partnerships between academia and service can be to structure all clinical-training endeavors around one hospital or hospital system. Students are placed in one clinical site for the duration of their clinical education and,

as discussed, can often contribute to the healthcare organization by seeking employment opportunities offered by the organization already having knowledge of the system and the needs of the particular patient demographic. The identification and evaluation of residency-based clinical teaching programs are explored in this section.

Li (1997) examined the relationship between clinical teaching behavior and perceptions of quality learning experiences by students and nursing faculty in a residency-based nursing education program. Eighty-one nursing students and 10 nurse educators participating in a 3-year hospital-based undergraduate nursing program were included in the sample. The recruitment method for the sample was not discussed, but there was a description of inclusion criteria. Nursing students must have been in the program for at least 6 months so that they would have enough experience with clinical faculty to identify effective teaching behaviors. The resulting sample was 39 junior-level students and 42 senior-level students. Nurse educators must have been clinical instructors for at least one year. The Knox and Morgan Nursing Clinical Teacher Effectiveness Inventory (NCTEI), a self-administered questionnaire, was used to assess perceptions of effective teaching in the clinical setting. The instrument uses a 7-point rating scale, and the participants rank according to the importance of specific teaching behaviors.

Ninety-one questionnaires were distributed and returned, thus giving a response rate of 100%. Based on means, 10 most important and 10 least important clinical teaching behaviors were identified by the nurse educators and by the students. The top six teaching behaviors were recognized mutually by students and educators.

These behaviors included explains clearly, does not criticize student in front of others, is a good role model, corrects students mistakes without belittling them, is open-minded and nonjudgmental, and provides support and encouragement to students. That these behaviors are agreed upon by both faculty and students alludes to their importance in the clinical setting. A key difference that was found was that students rated "Demonstrates clinical procedures and techniques" (Li, 1997, p. 1258) as the most important behavior but was rated as least important by the educator. This finding is not surprising when using Benner's (1982) novice-to-expert model as lens through which to view nurse competency. As previously noted, novice nurses are task-oriented and focus heavily on their ability to carry out technical procedures, whereas expert nurses have internalized these techniques and are able to focus more on the larger clinical picture.

Haas et al. (2002) described the implementation of preceptored clinical experiences across an undergraduate-nursing curriculum and the service-academia partnership that resulted from the endeavor. Reviewing evaluations from program alumni, employers, and current students and faculty, faculty were concerned that new graduate nurses were not prepared to safely and competently work in the healthcare environment. The evaluations indicated that new graduate nurses were "deficient in clinical skills and judgment and had unrealistic expectations of the work environment" (p. 519). In response to faculty desire, graduate evaluations, and recommendations from such key healthcare organizations as the U.S. Department of Health and Human Services, the Pew Health Professional Commission, the National League for Nursing, and the Nursing Education Advisory Committee, the College of

Nursing at the University of Texas at Tyler implemented preceptored clinical experiences for three of the four semesters within the nursing program. In this particular program, students entered the undergraduate-nursing curriculum as juniors. Students moved sequentially through four semesters or levels in order to complete the degree. The Board of Nurse Examiners for the State of Texas mandated that the first semester clinical experience continue to be the traditional, instructor-focused clinical-education model.

The preceptored clinical experiences were piloted with two clinical groups in semesters two (Adult Health I) and three (Care of the Childbearing Family) of the program. At both the Adult Health and Childbearing Family levels, students assigned to an existing clinical group were approached for participation in the innovative preceptored clinical experience. Students were then assigned to practicing nurse preceptors in the clinical setting. The Adult Health group were all placed in the same institution, whereas the Childbearing Family group were allowed to identify preceptors if desired and were placed in various healthcare environments such as labor and delivery units, community agencies, and occupational health.

The preceptors received inservices on such topics as principles of teaching and learning; roles of the student, preceptor, and faculty; anticipated advantages and disadvantages of preceptored experiences; and examples of interactions between student and preceptor. Preceptors acted as role models for the students and facilitated the meeting of clinical objectives by the students. They provided feedback on clinical performance to both the student and faculty. Each student was to follow the work schedule of his or her preceptor so that preceptors did not have to reschedule to

accommodate their new role. That students followed their preceptors' schedule also meant that students were working all available shifts thus allowing for a more even distribution of students on a unit at any given time and for nurses working shifts other than the day shift to function as preceptors. Students, unlike in traditional clinical teaching models, did not go to the hospital unit the night before to prepare for the upcoming shift by choosing and researching patients. Instead the students started the shift with their nurse preceptors and were expected to draw from available resources information that was needed to provide safe care. This action was seen to increase students' ability to think and gather information quickly. Faculty ultimately were responsible for the teaching and evaluation of the students and collaborated with the preceptors in the written evaluations at the middle and end of the rotation. Faculty also were available for consultation by pager for the preceptors and students.

The evaluations of the pilot project by the participating students, preceptors, and faculty were very positive. Among the advantages identified by students were increased clinical experiences, increased confidence, continuity, real-world expectations, and increased responsibility for their own learning. Preceptors saw their participation as contributing to personal satisfaction, having students move into a position of helping the preceptor toward the end of the rotation, and knowing the students' capabilities thus increasing continuity. Faculty identified factors such as increased collegiality with their partners in service, flexibility, and the ability to spend more individual time with students needing attention as benefits of the partnership (Haas et al., 2002). Among the disadvantages of the preceptored clinical experience identified by the students were the limitation of clinical experience to one patient

population and clinical experience being cancelled if preceptor was unable to work. Preceptors named time and added stress and responsibility as disadvantages, whereas faculty saw the increased demands of organizational time and expertise and being on call as disadvantages.

Based on the positive feedback, the preceptored clinical experience initiative was implemented the following semester with additional service partners, ultimately leading to more than 200 students participating in the innovative program across the final three semesters of the nursing curriculum. The endeavor worked as a model of service and academia collaborating toward a common goal. Service institutions are able to benefit from their role in developing graduate nurses to enter practice ready to assume the professional role. Nurses who train continuously in one institution are at a far greater advantage than those newly entering the institution as they are familiar with the hospital procedures, structure, and patient population. New graduate nurses prepared in this clinical-education model also expressed more confidence with their roles as nurses and in their experience with nursing skills. Further research needs to be conducted to investigate performance outcomes of nursing students who have participated in preceptored clinical experiences compared with the traditional model. The innovative model described in this study, however, clearly illustrates the advantages for the two key participants in the current health-care delivery system: service and academia.

In summary, this section of the literature has focused on the residency-based approach to clinical education where students remain at one institution for the majority of their clinical education. Benefits seen were continuity for both students

and preceptors or nurses working with the students. Students became familiar with the structure of the institution and the patient population and also were able to form a stronger connection with the nurses with whom they worked thus allowing for more consistent guidance and instructional scaffolding. The nurses with whom the students worked were able to hone their clinical instruction skills thus allowing for a more positive and productive learning environment. The residency approach also can be coupled with that of the preceptored clinical experience in which students remain with one nurse preceptor throughout the duration of their clinical practicum. The continuity derived from the precepted approach potentially can foster increased decision-making skill and role socialization in addition to clinical competency.

## Preceptor-focused Clinical Education

The precepted approach to clinical education is one that is used currently by many schools of nursing only during the semester prior to graduation. At this time, students are placed in a specialty rotation in which they are paired with a practicing-nurse preceptor. Students follow the preceptor's schedule and are expected to take on gradually all of the roles of the nurse. The focus of their care at this point moves beyond that of just the patient to encompass the breadth and complexity of the nursing role itself. For many students, it is a time when the bigger picture comes into focus and they are able to better prioritize care and function as a member of the interdisciplinary team. This section will focus on the benefits of the precepted experience, preceptor behaviors that contribute to a positive learning environment, necessary preparation of preceptors, and selected models of precepting.

Benefits of the precepted experience will first be reviewed in order to provide a context for preceptor-based clinical education. In an effort to identify student satisfaction and perceptions of achieving outcome objectives of a clinical course, Berry (2005) compared a clinical group of senior nursing students participating in a preceptored clinical experience with a similar group completing a traditional clinical experience. For the purpose of the study, a traditional clinical group was defined as one nursing instructor taking 6 to 10 students onto a nursing unit wherein students are assigned certain patients for whom they are to provide acute care. The preceptored experience was defined as a partnering of a "student and an experienced RN who engages and guides the student through clinical experiences" (p. 240).

The study design consisted of one clinical group participating in the traditional clinical experience for one semester compared with two clinical groups that participated in the preceptored model in the Fall semester of the 2 following years. A survey tool was used to assess overall satisfaction and perceptions of meeting course objectives of these three successive groups. In order to facilitate the partnership model, nurse managers, staff nurses, and the hospital's Office of Learning and Development were included in developing the precepting model. Preceptors were prepared through an orientation consisting of adult learning principles; role expectations for faculty, students, and preceptors; and a clinical map outlining the expected progress of student progress and increasing level of responsibility. In addition, the preceptors were expected to complete a survey of learning styles. Participating students were oriented to the preceptored clinical course by introduction to the clinical map, course syllabus, and course evaluation tools. Students also were

asked to complete the learning-styles survey and were matched with their preceptor based on compatibility of learning styles.

Upon evaluation, it was found that the preceptored model scores were higher in both achievement of satisfaction and achievement of course objectives. Using a 4-point Likert scale, with 4 being "strongly agree" and 1 being "strongly disagree," the class average for the first preceptored class was for each item .2 to .4 higher than the traditional class, and the scores for the second preceptored class averaged 0.6 to 0.8 higher than the traditional class. Items included such concepts as viewing the staff nurse as a positive role model, enhanced communication with the nurse, and the sharing of insight. Narrative comments also were gathered and supported the preceptored-clinical model. Participating students, preceptors, and faculty all found the experience to be positive. The findings of this study supported the move to preceptored clinical courses; however, as the students evaluated were members of classes in successive years, it was difficult to control for variability among the student classes. A stronger study design would have been to compare two or more groups of students within one semester, each participating in a different clinical-education model. Also it would have strengthened this study to involve students at different levels of the program not just the senior year in the design. Overall, the results speak to the potential for preceptored-clinical learning to provide an environment that fosters critical thinking and decision making, enhance socialization to the profession, increase opportunities for responsibility, and instill greater confidence and competence in the clinical setting (Berry, 2005).

As nursing students spend a large portion of their clinical time with their agency preceptors, the extent to which preceptors influence student learning cannot be underestimated. Not only are students learning clinical content, they also are being socialized into the nursing profession and learning clinical-reasoning and critical-thinking skills. Myrick and Yonge (2004) found that specific preceptor behaviors are pivotal in the development of critical thinking in students. A total of 45 preceptors and students from three different settings--community health, family health, and tertiary care--participated in a qualitative study that attempted to identify such behaviors. Participants were interviewed separately over a period of 3 years and were guided by such questions as "Describe your role as preceptor or preceptee" or "Tell me what the term critical thinking signifies for you" (Myrick & Yonge, p. 373). Data were collected using a tape-recorder and analyzed using the grounded theory method.

The results indicated that the one-to-one relationship of preceptor and student was a prominent factor in enhancing critical thinking. The development of that relationship also held the key to more effective development of critical thinking. Factors that enhanced the relationship and cultivated critical thinking included respect, flexibility, openness, safety or trust, and skepticism (Myrick & Yonge, 2004). Factors that curtailed critical thinking included being role conscious, constraining, closed, unsafe, and unquestioning. The potential for improving preceptored experiences based on these findings is great. Clinical instructors, in their role as liaison between curriculum and preceptors, can foster qualities that provide enhanced critical-thinking development in precepted students. Introduction and fostering of

qualities that enhance critical thinking can be done as part of a preceptor orientation that combines both a formal meeting and preceptor handbook outlining specific traits or behaviors that facilitate learning in a precepted environment. Although this study was performed with graduate nursing students, the qualities identified through the extensive interviewing process are transferable to undergraduate students. Themes of safety, respect, openness, and flexibility are fundamental to any positive learning environment, especially one in which increased student anxiety due to high-stakes consequences can be a factor (Myrick & Yonge).

Knowing that nursing students spend much of their clinical time with their preceptors and that preceptors play a large part in role socialization, skill acquisition, and critical thinking, the next question that arises is what is the most effective way in which to prepare a community-based preceptor. Charleston and Goodwin (2004) looked at preceptorship training as a way to provide more effective preceptorships, ensure positive clinical experiences, and improve recruitment and retention rates for new graduates in community-based mental-health nursing. Citing literature supporting the notion that clinical placement is the key factor for choosing mental-health nursing as a career, the study identified preceptor support as a critical component of creating a positive precepting environment (Charleston & Goodwin). To evaluate how to best support preceptors, a workshop aimed at mental-health nursing preceptors working in the field was designed and implemented.

Workshop participants were recruited from rural areas in the Australian state of Victoria. Seventeen of the 19 participants were community-based mental-health nurses, the other two participants were a consumer consultant and a nurse educator.

The workshop focused on developing and extending skills in student supervision and comprised an initial 2-day workshop, online postings regarding a weekly theme on preceptorship, and a one-day follow up approximately one month later. Local faculty and staff from the Centre for Psychiatric Nursing Research delivered the content of the workshop. Goals of the workshop included being able to "identify conceptual underpinnings of a learning organization, outline various models of teaching and learning relevant to preceptorship, apply skills in student supervision, and implement a student supervision program in the workplace" (Charleston & Goodwin, 2004, p. 227). Course content was comprised of such areas as competency-based education, standards of practice, models of supervision, and learning outcomes and assessment. Teaching and learning strategies included didactic and experiential approaches, the use of audiovisual materials, and encouragement of participant-directed study.

Preceptors who completed the workshop identified four ways in which participation in the course would alter their future practice: (a) "more awareness of students needs and learning styles," (b) "greater insight and therefore application of the role of preceptor," (c) "a broader knowledge base to apply in practice," (d) "greater knowledge of practical ways to support students" (Charleston & Goodwin, 2004, p. 230). Overall, the preceptors indicated that they were better prepared to provide positive preceptorship experiences, particularly as a means for undergraduate nurses to choose mental nursing as a career.

A second study by Charleston and Goodwin (2004) followed-up on the increasing popularity of the preceptor workshop described above and sought to evaluate the large-scale impact of the preceptor course on mental-health practice.

Surveys were distributed to workshop participants at the end of each course. In total, 154 surveys were distributed to participating nurses, and 150 were returned. The instrument consisted of closed- and open-ended questions. Participants were asked to respond to 15 statements and rate their experience on a scale from 1 (strongly disagree) to 10 (strongly agree). Participants also were asked to write comments about specific areas of the course they found useful and any areas they thought could be improved. Descriptive statistics were performed to analyze the survey data. Survey results showed an overall satisfaction with the preceptorship workshop. More importantly, results indicated that participants gained confidence in their precepting abilities and were more inclined to change their precepting practice as a result.

These two studies indicate the training is critical for developing preceptors who are competent, confident, and willing to provide a good learning experience for their preceptees. Currently, preceptor training does not commonly exist. Agencies often have financial and human resource barriers to providing training for staff who precept students. A training program created and performed by nursing faculty from schools of nursing that use these agencies could be key solution to this problem. Undergraduate nursing departments, for example, could hold a 4-hour workshop at the beginning of the semester to address the unique issues that arise from community precepting. An additional benefit that would arise from an oncampus training workshop would be the sense of connection preceptors develop with the nursing faculty and the university.

In the previous sections, preceptor roles, behavior, and training have been identified and presented. The roles of student and clinical instructor, as integral parts

of the preceptorship triad, however, have not yet been explored. The Integrative Clinical Preceptor (ICP) model has been proposed to delineate the responsibilities of each and to propose effective ways in which the three can work together to form a preceptorship experience that is beneficial for the student, preceptor, and the clinical instructor as an agent of nursing education (Mallette, Loury, Keehner, & Andrews, 2005). The ICP model holds the concept of reciprocal collaboration at its core. Under the ICP model, each contributor has distinct responsibilities. The prelicensure student should be a self-directed service learner and a novice case manager. The preceptor needs to be a clinical teacher, role model, and expert case manager. The faculty member should be an educator, facilitator, role model, consultant, and researcher (Mallette et al.). By fulfilling their expected roles, the triad ultimately will provide the best possible care for the populations with whom they work.

To apply the ICP framework to an authentic clinical experience, a collaborative partnership between a school of nursing and nurses in community-health settings was set up. The community-health nurses and the agencies in which they worked were provided information about the model, and all agreed to participate in the pilot phase of implementation. The key feature of the model was to provide training for each of the participants so that they were aware of their respective responsibilities. Preceptor training was the first step that was undertaken. A 3-hour workshop was taught by a faculty member and included characteristics of a good preceptor, role expectations and responsibilities, conflict resolution, and effective teaching and learning principles. An interactive piece also was held and focused on problem solving and case studies. Students also were oriented to the ICP model.

The interactive piece was particularly important because students enter community-health nursing with limited experience in a clinical setting that requires a high degree of autonomy (Mallette et al., 2005). Students received a 9-hour orientation over 2 days in which course objectives, role expectations, and the underpinnings of community-health nursing were presented. Finally, a key part of the success of the ICP model was to make the faculty role explicit. Faculty communication with students and preceptors was formalized, and a minimum number of site visits was set, along with items that should be covered at each visit. In this particular collaboration, faculty were to meet with students at least 2 times per semester due to the great distances between clinical sites and excessive driving time to visit each site. During a visit, faculty were to review course objectives and student progress. Time was allotted to observe the student in practice and to discuss student performance with both the preceptor and student.

Upon evaluation at semester end, 100% of the students surveyed said that the preceptor and the preceptor experience met their expectations (Mallette et al., 2005). Although no formal process was used to obtain preceptor feedback, informal evaluation showed that preceptors valued the alliance with faculty created by the collaborative ICP model. Preceptors looked to faculty as experts from whom they could learn and as an access point through which to obtain adjunct faculty positions. Faculty, in fact, encouraged preceptors to pursue adjunct faculty positions as a way of further cementing the bond between clinical agencies and the school of nursing. Overall, the formalized model of preceptorship created by introduction of the ICP allowed for a better experience by all involved. This intervention was performed at

the community-based nursing level, but the intervention has important implications for clinical education across the nursing curriculum. Schools of nursing should look to create a more structured collaboration between nurses in clinical agencies and faculty members. A clear description of the roles for each person in the triad should be included in a targeted training. In this way, expectations are explicit and accountability for working within the defined roles is present.

The critical role that preceptors play in clinical nursing education has been established. In the residency-based clinical model, students are expected to function more autonomously than in standard clinical education models. This increased autonomy is due to two factors. First, clinical faculty is not present physically with students most of the time so students must start assuming the role of an apprentice nurse immediately upon entering the clinical environment. Second, in the residency model, the role of a student is now nurse-focused and the student is expected to take on gradually all roles of the nurse preceptor as opposed to the student nurse who is patient-focused and is responsible solely for patient care. The clinical focus broadens to encompass all clinical-nursing activities thus decision-making is an expectation. This expectation can be an anxiety-causing situation for a nursing student still at the novice stage of skill development so it is essential that the agency preceptor be well prepared to facilitate student learning.

Specific preceptor behaviors that contribute to a positive precepted experience have been identified, as have ways in which students perceive their development of critical thinking is supported. Descriptions or examples of these behaviors should be given to preceptors in some kind of formalized process whether through a faculty-

preceptor meeting or in a preceptor handbook that is distributed as a resource to all preceptors. A structured preceptor-training course is also an essential part of preceptor preparation and should be undertaken prior to the beginning of the semester. A training provided by the affiliated school of nursing would be the most effective type of preceptor training as preceptors would be trained in a manner consistent with faculty and school expectations (Mallette et al., 2005). Preceptors also would have an increased sense of connection to the faculty and the curriculum (Mallette et al.). Finally, use of a framework to guide the collaborative relationship between the student, faculty, and preceptor would help calibrate expectations of the precepted experience and hold each person accountable for his or her role within the triad. Preparation can be done by outlining clear goals and expectations and by providing training so that preceptors are able to meet their own teaching potential and thus effectively train future generations of nurses.

It can be concluded from this section that precepted clinical experiences can be very effective for student learning and for creating and sustaining partnerships between academia and service. There are key elements that must be in place for the precepted clinical experience to be successful, however. In each of the studies reviewed, preceptor preparation and clear understanding of participants' roles were essential. Commitment from both the academic and healthcare organizations was also necessary to ensure support for the endeavor and for continued supply of human resources needed to facilitate the preceptorships.

## Conclusion

In response to a rapidly changing healthcare delivery system and an increasing shortage of nurses, the nursing profession has called upon nursing education for better preparation of students who, upon entering clinical practice, are ready to provide safe and competent care to patients with complex needs. According to AACN (1998), graduates are expected to enter practice at a higher level and must go beyond knowledge acquisition to embrace metacognitive strategies that facilitate working in a complex environment.

The literature that has been reviewed supports the residency-based approach to clinical nursing education in that it provides an empirical foundation for increased clinical decision-making competency, role socialization, and professionalism. Using Benner's (1982) novice-to-expert theoretical model as the basis of this study, it is evident that nurses move through the five stages of skill acquisition in a consistent manner and that expertise in nursing practice comes from clinical experience. With the challenges of preparing new graduate nurses to function safely and competently in an increasingly complex health-care environment, it is imperative that nursing education facilitate the development of expertise in clinical decision making.

There is an extensive body of research that has investigated the development of clinical decision making in nursing students. Research in this review has identified decision-making models used by nurses in the clinical setting (Manias et al., 2004; Plummer et al., 2005; Ritter, 2003), factors that promote effective learning of clinical decision making (Hagbaghery et al., 2004; Hoffman et al., 2004; White, 2003), and methods used to assess clinical-decision-making ability (Girot, 2000; Roche, 2002).

The findings of this research allow for nursing faculty to guide or role model effective clinical-decision-making practices for students and to facilitate learning environments in which development of decision-making expertise is supported.

Research in this review also has introduced innovations in clinical-nursing education including an evaluation of how novel pedagogical practices meet the needs of the current healthcare system (Ben-zur et al., 1999) and ways in which collaborative partnerships between academia and service can best be used to create quality new graduates and fill the increasing need for nurses (Close et al., 2000; Woods & Craig, 2005). Research examining the success of residency-based nursing programs in which clinical education is centered around one hospital or hospital system also was reviewed (Li, 1997; Haas et al., 2002). Benefits seen as a result of the residency-based approach were continuity of clinical experience for both student and nurse, increased familiarity with the institutional structure and patient population, and formation of stronger relationships between students and the nurses with whom they worked allowing for greater development of decision-making skill and role socialization. The residency-based model has been proposed as a viable option for addressing the emerging needs of health care. Academic-service partnerships are well positioned to support this model.

Finally, research exploring the effectiveness of preceptor-focused clinical education was reviewed. The research provided support for residency-based clinical-education programs in which students are paired with a nurse preceptor for the duration of the clinical practicum in addition to remaining at the same health-care institution for the majority of the undergraduate-nursing curriculum. Research

exploring the benefits of the precepted experience showed findings of enhanced critical-thinking and decision-making ability, role socialization, responsibility, and greater confidence and competence in the clinical setting (Berry, 2005). Positive preceptor behaviors were identified as respect, flexibility, openness, safety or trust, and skepticism that prompted questioning of clinical decisions (Myrick & Yonge, 2004). These preceptor qualities could be used to guide the preparation of potential nurse preceptors for participation in a residency-based clinical education program.

Research exploring preceptor preparation also was reviewed and findings indicated that training is critical for developing preceptors who are competent, confident, and able to provide a good learning environment for their preceptees (Charleston & Goodwin, 2004). Preceptor training commonly does not exist in the current clinical-education model. Recognition that preceptor training is essential for effective precepting is vital for the success of the residency-based approach. Finally, research examining the clinical-education triad comprised of nurse preceptor, student, and nurse faculty was reviewed. The findings showed that a structured model in which role expectations for each member of the triad are defined clearly, communication is frequent, and preceptors are trained to meet both the needs of the student and the course objectives is critical for the success of a preceptored clinical experience (Mallette et al., 2005).

The nursing shortage demands that nurses are prepared to think critically and make sound decisions as soon as they begin working in the clinical setting. The residency-based approach can be part of the solution toward preparing safer, more competent new graduate nurses. The research demonstrates that when students are

able to remain in one clinical setting for the duration of their clinical training and to work one-on-one with a nurse preceptor they can achieve higher levels of clinical competency as outlined in Benner's (1982) novice-to-expert theoretical model. Few studies, however, have investigated the effect of precepted, residency-based clinical education on perceived clinical-decision-making competencies of undergraduate nursing students. The review of literature provides the empirical foundation and rationale for this study.

# CHAPTER III

# METHODOLOGY

This study investigated the effect of participation in a residency-based clinical-education course on nursing-student perceptions of clinical decision making. This chapter contains a restatement of the research questions, a description of the study design, sampling and data-collection procedures, and human-subjects considerations. A presentation of the reliability, validity, scoring, and administration procedures for the instrumentation also is included.

## Research Design

Using a comparative design, the perceived decision-making competencies of two groups of seven nursing students completing their second-semester clinical practicum participating in a newly-created semester-long residency-based clinical-education class was compared with four groups ranging from five to nine sophomore-level nursing students undergoing clinical education in a traditional instructor-focused clinical course. In addition, students from a different university with an existing residency-based program were used for comparison. The students in the existing residency-based program were completing their first semester of in-hospital clinical training and were accessed as a whole class in their theory class, as opposed to separate clinical groups. There were 2 levels of the independent variable: (a) nursing students who participated in the residency-based clinical-education program and (b) nursing students who participated in the traditional clinical-education program. There were two dependent variables assessed in the study: (a) student scores on the CDMNS and (b) student evaluations of their preceptor or clinical instructor and their

overall clinical experience. Residency-based clinical education was defined as an innovative clinical education approach in which nursing students are placed in one healthcare facility for the duration of the nursing program and partnered with a nurse preceptor in a different practice unit each semester. Traditional, or instructor-led, clinical education was an instructional model in which one nurse faculty instructs and supervises a group of approximately 8 to10 nursing students in the clinical setting (Roche, 2002). In this study, traditional clinical groups ranged from 5 to 9 students. Students worked with different nurses for each shift on the unit and move among different healthcare institutions during the nursing program.

This study was carried out with students completing prelicensure nursing coursework at two universities. The inclusion of the second university served to act as a comparison group to the newly-created residency-based clinical program. The study investigated whether differences existed in perceived decision-making competencies between students in the newly-created residency-based clinical program and those of students who are part of an established residency-based program at the second university. Students self-selected into the residency- or instructor-based tract at the university with the newly-created residency-based clinical program, whereas at the university with the existing program there was no other option for students. Once students chose a tract, they continued with the same educational tract through the duration of the program. All students were administered the Clinical Decision Making in Nursing Scale (CDMNS; Jenkins, 1985a) at the beginning of the semester during the first weeks of the clinical rotation. Students were then re-administered the same instrument at the end of the semester at the conclusion of the clinical rotation.

Training of preceptors involved in the residency-based approach occurred prior to student entrance into the clinical setting. Training was carried out by the nursing faculty members designated to supervise students participating in the residency-based clinical program at each of the hospitals. Preceptor training materials consisted of information on teaching learning strategies, evaluation methods, literature outlining preceptored clinical models and collaborative partnerships between academia and service, and the course syllabus. Depending on which type of clinical education the student pursued, students also evaluated their clinical experience and their preceptor or their clinical instructor using the Satisfaction with Clinical Instructor and Satisfaction with Preceptor Tool (see Appendixes A and B).

## General Characteristics of the Study Sample

The study sample was comprised of 54 nursing students completing their first semester of hospital-based clinical training within a Bachelor of Science in Nursing (BSN) program at two different universities: a private university on the West coast of the United States and a public university in the Southeastern United States. Although the nursing-student populations at the two universities were heterogeneous in age and levels of prior work experience, the majority of students were female. Demographic characteristics of the study sample are seen in Tables 1 and 2.

Table 1

*Demographic Characteristics of the Study Sample by University*

| Demographic Characteristics | Students at West-coast University (n = 41) | | Students at Southeastern University (n = 13) | |
|---|---|---|---|---|
| | f | % | f | % |
| Male | 2 | 4.9 | 3 | 23.1 |
| Female | 38 | 92.7 | 10 | 76.9 |
| 18 years old or under | 1 | 2.4 | 0 | 0.0 |
| 19 to 25 years old | 33 | 80.5 | 3 | 23.1 |
| 26 to 30 years old | 3 | 7.3 | 6 | 46.2 |
| 30 to 40 years old | 2 | 4.9 | 3 | 23.1 |
| 41 years old or more | 1 | 2.4 | 1 | 7.7 |
| Less than 6 months of clinical experience | 27 | 65.9 | 9 | 69.2 |
| 6 months to 1 year of clinical experience | 9 | 22.0 | 2 | 15.4 |
| 2 to 3 years of clinical experience | 1 | 2.4 | 2 | 15.4 |

Students from the Southeastern university tended to be older than students at the university on the West coast. Additionally, the age of the students at the Southeastern university had greater variation than that of students at the West-coast university. The variation in age and the trend toward older students may have been due to the fact that, in addition to students completing the BSN as a first Bachelor's degree, the Southeastern program also included students who were completing the BSN as their second Bachelor's degree. The distribution of the amount of clinical experience outside of the nursing program was similar at both universities with most students having less than 6 months of experience.

Students in the residency-based clinical group were more likely to be older and have more variability in age than students in the traditional clinical group. The distribution of the amount of clinical experience outside of the nursing program was

similar in both clinical groups with most students having less than 6 months of experience.

Table 2

*Demographic Characteristics of the Traditional Clinical Group and the Residency-Based Clinical Group*

| Demographic Characteristics | Traditional Students (n = 27) | | Residency-Based Students (n = 27) | |
|---|---|---|---|---|
| | f | % | f | % |
| Male | 1 | 3.7 | 4 | 14.8 |
| Female | 26 | 96.3 | 22 | 81.5 |
| 18 years old or under | 1 | 3.7 | 0 | 0.0 |
| 19 to 25 years old | 23 | 85.2 | 13 | 48.1 |
| 26 to 30 years old | 2 | 7.4 | 7 | 25.9 |
| 30 to 40 years old | 1 | 3.7 | 4 | 14.8 |
| 41 years old or more | 0 | 0.0 | 2 | 7.4 |
| Less than 6 months of clinical experience | 19 | 70.4 | 17 | 63.0 |
| 6 months to 1 year of clinical experience | 4 | 14.8 | 7 | 25.9 |
| 2 to 3 years of clinical experience | 1 | 3.7 | 2 | 7.4 |

The Fall 2006 registration data from the West-coast university showed that there were 573 undergraduate students enrolled in the nursing program. Seventy-one of these students were male, and 502 were female. University-wide ethnicity data revealed that 5% of undergraduate students were African American, 13.1% were Hispanic American, 21.5% were Asian American, 38.2% were European American, and 4.6% were multiethnic. Predominant age groups for university-wide undergraduate students were 18 years (20.2%), 19 years (18.3%), 21 years (18.8%), and 22 years (8.6%). The remaining 34.1% of the students were more than 22 years old.

Demographic data for Fall 2007 for the Southeastern university showed that there was a total university-wide undergraduate enrollment of 34, 077 and an ethnic

breakdown of freshman students that included 11% African American, 11% Hispanic American, and 5% Asian/Pacific Islander American. The remaining 73% were European American or unreported. The undergraduate nursing program served 944 undergraduate students with an average age of 21 years.

## Protection of Human Subjects

Approval from the Institutional Review Board for the Protection of Human Subjects (IRBPHS) was obtained at the West-coast university and permission from the Dean of the College of Nursing was obtained from the Southeastern university prior to data collection. Written permission was sought and obtained from the clinical instructors and from the program deans (see Appendixes C and D). Nursing students who chose to participate in the study were provided a cover letter for the pre- and posttest (see Appendixes E and F). The cover letter stated the general intention of the study and requested participation. The cover letter also informed students that anonymity was protected. All information was kept confidential, and responses were kept in a secure location. In order to compare pre- and posttest CDMNS scores for each clinical group, student were asked to supply the first three letters of their mother's maiden name and the last four digits of their student identification number or social security number on the answer sheet. As participation in the study was voluntary, students were free to decline to be in this study or withdraw from it any point. There was no foreseeable harm to students participating in the study. There were no consequences for not participating in this study. Students had the option to read an article on clinical-nursing education in lieu of completing the CDMNS.

## Location or Setting Where Study Took Place

The study took place in the undergraduate nursing programs of two universities: a private university in Northern California and a public university in the Southeastern United States. Both universities have well-established undergraduate and graduate nursing programs. The nursing program at the private university offers a 4-year undergraduate degree, in which students are admitted as freshmen, Master of Science in Nursing (MSN) degree, and a Doctor of Nursing Practice (DNP) degree. The School of Nursing is accredited by the Western Association of Schools and Colleges (WASC), the California Board of Registered Nursing, and the Commission on Collegiate Nursing Education (CCNE) and has been conferring degrees since 1954.

The public university, established in 1960, offers freshman admission into the undergraduate program and confers bachelor's, master's, and doctoral-level degrees in nursing. The College of Nursing is accredited by CCNE, the Florida Board of Nursing, the Southern Association of Colleges and Schools (SACS), and the National League for Nursing Accrediting Commission (NLNAC).

## Data-Collection Procedure

Data collection occurred at the beginning and end of the Fall 2007 and Spring 2008 semesters. Within the first 2 weeks of beginning clinical education in the hospital, all participating students were administered the CDMNS in order to assess baseline clinical decision-making perceptions. Students were assessed again using the CDMNS at the end of the semester.

In the Fall 2007 semester, the CDMNS was administered by the researcher via an online survey link that was emailed to three individual clinical groups of 6 to 7 students each at the West-coast university. The response rate for students approached in this way was approximately 95%. Through discussion with the dean of the nursing program in the Southeast region of the country, it was agreed that the best method of distributing online survey links to the students attending was to make available the link to the online survey through an online theory class portal. The link was provided to the entire first-year nursing student population of 120 students at the public university by the first-year theory instructor at the Southeastern university. Students were then encouraged to complete the online survey by their theory instructor. The response rate for the online survey administration was very low at approximately 29% for the pretest and 11% for the posttest. The students at the Southeastern university received a paper-based posttest in addition to the online tool when response rates for the posttest were noted as very low. Even when the paper-administration of the posttest tool was performed by the theory instructor, the class response rate remained low with participation of only 37% of the pretest students. In the Spring 2008 semester, a paper-based CDMNS was administered to three individual clinical groups of 5 to 9 students each at the West-coast university. The response rate for the pretest and posttest was 100%. Permission was sought from individual clinical-nursing instructors and deans of the two schools of nursing in writing prior to the beginning of the semester. Instructors at both universities followed up with students in the 2 weeks after the online pretest and posttest links were provided to ensure participation. In the Spring 2008 phase of data collection, all administration was performed via a

paper tool and also was completed locally. The retention rate for participants was 100%.

Students were instructed to check the first item that comes to mind with little or no deliberation as outlined in the instructions to the CDMNS. Students had approximately 20 minutes to complete the scale. Each student was administered the CDMNS at the beginning of the semester within the first 2 weeks of entering the hospital setting. Participating clinical groups were again approached at the end of the semester for re-administration of the CDMNS. Retention of participants was ensured by obtaining clinical-instructor support for the investigative process.

At the end of the Fall 2007 and Spring 2008 semesters, students also were asked to evaluate their preceptor or clinical instructor, depending on which type of clinical education they have participated, using the Satisfaction with Clinical Instructor and Satisfaction with Preceptor Tool. In addition, preceptors who participated in the Fall 2007 residency-based clinical-education program at the West-coast university were asked to evaluate the training they received.

## Instrumentation

There were two instruments used in this study: the CDMNS and the Satisfaction with Clinical Instructor and Satisfaction with Preceptor Tool. Development and pilot testing procedures for each instrument are discussed in this section. The CDMNS is a 40-item, 4-subscale instrument that originally was developed to assess perception of clinical-decision-making competencies in nursing students. At the time of the CDMNS's development, there was a general lack of decision-making tools containing information related to reliability and validity.

Furthermore, the decision-making tools available were rooted in management and administration and "were universally supported with data from male samples" (Jenkins, 1985a, p. 221). The conceptual framework used to develop the scale was drawn from Janis and Mann's (1977) *Decision Making: A Psychological Analysis of Conflict, Choice, and Commitment*. In order to cultivate a decision-making theory for conflict situations, Janis and Mann conducted an extensive review of the literature looking at normative structures of effective decision making. From the review, seven criteria assumed to lead to an ideal decision-making process were derived and include the following:

> The decision maker, to the best of his ability and within his information processing capabilities
> 1. thoroughly canvasses a wide range of alternative courses of action;
> 2. surveys the full range of objectives to be fulfilled and the values implicated by the choice;
> 3. carefully weighs whatever he or she knows about the costs and risks of negative consequences, as well as the positive consequences, that could flow from each alternative;
> 4. intensively searches for new information relevant to further evaluation of alternatives;
> 5. correctly assimilates and takes account of any new information or expert judgment to which he is exposed, even when the information or judgment does not support the course of action he initially prefers;
> 6. reexamines the positive and negative consequences of all known alternatives, including those originally regarded as unacceptable, before making a final choice;
> 7. makes detailed provisions for implementing or executing the chosen course of action, with special attention to contingency plans that might be required if various known risks were to materialize. (Janis & Mann, 1977, p. 11)

The seven criteria were distilled into four categories or subscales. The four subscales of the CDMNS comprise (a) search for alternatives or options, (b) canvassing of objectives and values, (c) evaluation and reevaluation of consequences, and (d) search for information and unbiased assimilation of new information. Items

were then generated and grouped according to the four subscales. This grouping was important as responses to specific situations occur in patterns so a person tends to go through the same process to make similar decisions (Waltz & Jenkins, 2001). The grouping is congruent with the belief in Western culture that when a decision is approached systematically, the chances that the solution will be correct is increased (Jenkins, 1985a). The CDMNS has been used in research on nursing education, specifically by Byrnes (2000) and Girot (2000), to assess perceptions of clinical-decision making in nursing students.

*Reliability and Validity*

Content validity was established through a series of steps. First, a review of the literature was performed looking at decision making as it related to clinical nursing. Second, a pretest was performed with 32 senior nursing students followed by a review of items for congruity and clarity by eight students. Finally, using a matrix a panel of five nurse educators provided a critique of each item on the basis of representativeness, sense of construction, appropriateness, and degree of independence from other items (Jenkins, 1985a). Each item was given a total score according to matrix, and all items achieving an overall 77% agreement were retained. Items achieving 70% to 76% were reviewed further for inclusion. Internal reliability was assessed by determining a Cronbach's coefficient alpha of 44 items for 33 pilot scores. A .79 reliability coefficient was calculated. Following examination of the intercorrelations, 4 items having the lowest coefficients were dropped. The reliability for the final 40-item instrument was reported to be a Cronbach's coefficient alpha of .83 (Jenkins, 1985a).

The resulting CDMNS comprised a total of 40 items. Formal testing of the instrument took place with a sample of 111 nursing students (27 sophomores, 43 juniors, and 41 seniors) who were finishing a semester-long clinical course. Upon analysis of the data, no statistically significant differences were found among students except for Subscale A: Search for Alternatives or Options (F = 5.45; Jenkins, 1985a). Scheffe′ post hoc analysis determined the greatest difference to be between senior and junior students. Sophomore students did not differ significantly from either group on this subscale.

CDMNS items are statements for which students are to think of their behavior while caring for clients. The statements include such concepts as the ability to be objective when one's values conflict with those of client, the weighing of risks and benefits when making a decision, and seeking advice from peers when engaged in decision making. Students are given 20 minutes to complete the scale and are instructed to answer based on what they are currently doing in the clinical setting. The five answer choices are Always: What you consistently do every time, Frequently: What you usually do most of the time, Occasionally: What you sometimes do on occasion, Seldom: What you rarely do, and Never: What you never do at any time. Item scores range from 5 (Always) to 1 (Never) and possible total scores range from 40 to 200. Possible scores for each subscale range from 10 to 50. A higher score indicates a higher quality of clinical decision making. Scoring of the CDMNS is based on a weighted scale denoting 22 positive items and 18 negative items. Scoring is based on the CDMNS scoring key.

In order to develop the satisfaction tool, research on effective teaching and precepting strategies was reviewed and themes identified (Berry, 2005; Li, 1997; Myrick & Yonge, 2004). The results of the literature review were used to create 10 items for the satisfaction tool. The satisfaction tool used a 5-point Likert scale of 5 (Strongly Agree) to 1 (Strongly Disagree). The satisfaction tool also contained questions pertaining to demographics and required students to indicate their gender, age, and amount of clinical experience outside of nursing school. Although the Satisfaction with Clinical Instructor and Satisfaction with Preceptor Tool was one instrument, there were two versions of the instrument administered to students. Students participating in the traditional clinical-education model completed the instrument in which they were asked to evaluate their clinical instructor whereas students completing the residency-based clinical-education model were asked to evaluate their preceptor. All students were asked to evaluate their overall clinical experience. Prior to administration, the satisfaction tool was assessed for content validity by a panel of four nursing faculty with expertise in assessment and evaluation. At the time of posttest administration of the CDMNS, students were administered the version of the Satisfaction with Clinical Instructor and Satisfaction with Preceptor Tool congruent with the clinical-education model in which they participated.

*Pilot Testing*

The CDMNS was pilot tested with sophomore-level students in the Spring semester of 2007 at one of the participating universities. The purpose of the pilot was to assess feasibility of administration of the CDMNS to nursing students in the

clinical setting, to become familiar with the process of data analysis specific to this instrument, and to assess test-retest reliability. Two groups of students, each pursuing one of the two clinical-education tracts, were assessed using the CDMNS. IRBPHS approval was obtained to administer the CDMNS to students in each clinical group prior to engagement in patient care and again in the last 2 weeks of the semester when students were finishing their clinical rotations. Data were collected at the pre- and posttest administrations and results were analyzed for differences in perceived clinical decision-making between the two clinical groups, test-retest reliability, and the interrelationship between the subscales. Statistical analysis for test-retest reliability showed that there was a nonstatistically significant correlation of .36 between the pretest and posttest. The absence of a statistically significant correlation for the student scores is not surprising as scores were expected to improve from the pretest to the posttest over the course of the semester as a result of clinical experience. Although 11 of the 12 scores showed change, only 7 of these 11 scores showed improvement.

At the time of posttest administration of the CDMNS, the Satisfaction with Clinical Instructor and Satisfaction with Preceptor Tool was pilot tested. The tool was assessed for content validity by a panel of four nursing faculty with expertise in assessment and evaluation and the panel's feedback was incorporated into the final version of the tool. IRBPHS permission was sought prior to administration of the tools. Upon completion, the satisfaction tool was assessed for suitably of administration to targeted groups and reliability. Students reported no concerns with the CDMNS or the satisfaction tools. The satisfaction tool was administered to

students one time only at the end of the clinical rotation, and each item was treated separately, therefore minimizing concerns of reliability.

## Research Questions

There are two major research questions and nine minor research questions. The major research questions are as follows:

1. To what extent is there a change in Clinical Decision Making in Nursing Scale (CDMNS) scores from pretest to posttest after student participation in a residency-based clinical course?
2. To what extent is there a difference in CDMNS change scores for students in a residency-based clinical course and students in a traditional instructor- focused clinical course?

The minor research questions are as follows:

1. To what extent is there a difference in the CDMNS Subscale A (Search for Alternatives or Options) change scores for students in a residency-based clinical course and students in a traditional instructor-focused clinical course?
2. To what extent is there a difference in the CDMNS Subscale B (Canvassing of Objectives and Values) change scores for students in a residency-based clinical course and students in a traditional instructor-focused clinical course?
3. To what extent is there a difference in the CDMNS Subscale C (Evaluation and Reevaluation of Consequences) change scores for

students in a residency-based clinical course and students in a traditional instructor-focused clinical course?

4. To what extent is there a difference in the CDMNS Subscale D (Search for Information and Unbiased Assimilation of New Information) change scores for students in a residency-based clinical course and students in a traditional instructor-focused clinical course?

5. To what extent do nursing students participating in the residency-based clinical education model and in a traditional instructor-focused program differ in their satisfaction with the experience?

6. To what extent is there a relationship between age and student change scores on the CDMNS and CDMNS subscales?

7. To what extent is there a relationship between amount of clinical experience outside of nursing school and student change scores on the CDMNS and CDMNS subscales?

8. To what extent is there a difference between student ratings of the instructor in the traditional clinical course and the student ratings of the preceptors in the residency-based clinical course?

## Data Analysis

Analysis of findings included CDMNS total, subscale, and change scores for each of the six groups, and responses from the Satisfaction with Clinical Instructor and Satisfaction with Preceptor Tool. Descriptive statistics were used to present participation data. Preliminary analysis of the data using a one-way analysis of

variance (ANOVA) was performed in order to discover differences on the pretest between the two groups in the residency-based program at the West-coast university and residency-based program at the Southeastern university and between the four traditional instructor-led comparison groups at the West-coast university were tested. There were no statistically significant differences between the residency-based groups at each of the two universities or between residency-based groups from the Fall and Spring semesters, thus the data for each university were pooled. All tests were performed at an overall error rate of .05. That is, each test was performed at the .05/4 or .0125 level.

To address the first major research question, the difference scores from pretest and posttest were compared separately for the residency-based and traditional instructor-led groups using the dependent-samples t tests. The second major research question was addressed using the independent-samples t test to compare the change scores computed from the difference between the pretest and posttest scores for the two groups. Minor research questions 1 thru 4 were addressed in the same manor. Effect sizes were computed and measures of explained variance were used to assess practical importance. Minor research question 5 was addressed using crosstabs to identify frequency of responses and chi-square tests. Minor research questions 6 and 7 were addressed using correlation ratios. The last minor research question was addressed using crosstabs to identify frequency of responses and chi-square tests.

# CHAPTER IV

# RESULTS

The purpose of this study was to investigate the differences in perceived decision-making competencies between nursing students who completed a traditional clinical instructor-led course and nursing students completing an innovative residency-based clinical course. The nursing students participating in the residency-based course were precepted over the course of the semester by a registered nurse working on the assigned unit. At the beginning of the semester, the Clinical Decision Making in Nursing Scale (CDMNS), a 40-item tool, was administered to both types of student groups as a pretest. The tool, along with a student evaluation of the clinical experience, was then re-administered to the same students at the end of the semester as a posttest. The statistical methods and the results of the data analysis of the pretest, posttest, subscale, and change scores obtained from student responses to the CDMNS and the Satisfaction with Clinical Instructor and Satisfaction with Preceptor Tool are presented. Additionally, an interview with a preceptor who provided perspective on residency-based clinical education is presented.

The CDMNS is a 40-item tool designed to assess nursing-student perception of decision-making competencies in the clinical-education setting. Each item describes a behavior that students may engage in while working with patients and is rated on a scale from 1 (Never) to 5 (Always). The possible total score ranges from 40 to 200. There are also 4 subscales of 10 items each. The four subscales are Subscale A: Search for Alternatives and Options, Subscale B: Canvassing of Objectives and Values, Subscale C: Evaluation and Reevaluation of Consequence,

and Subscale D: Search for Information and Unbiased Assimilation of New Information. The possible score range for each subscale is 10 to 50. The normative group from which the CDMNS was developed consisted of 111 nursing students (27 sophomores, 43 juniors, and 41 seniors). The means and standard deviation of the normative group were not available.

## Preliminary Analysis

Preliminary analysis of the pretest scores was performed using a one-way analysis of variance (ANOVA) in order to discover if any significant differences existed among the clinical groups. The two groups in the residency-based program at the West-coast university and residency-based program at the Southeastern university and the four traditional instructor-led comparison groups at the West-coast university were tested. Pretest scores for each of the four groups of traditional clinical students were compared and no statistically significant differences were found. Pretest scores for each of the three residency-based student groups also were compared and no statistically significant differences were found. Therefore, the four traditional clinical groups and the three residency-based groups were combined into two groups, the traditional group and the residency-based group, for purposes of statistical analysis.

Students participating in the traditional clinical-instruction program had higher means on the pretest and posttest than students completing the residency-based program. Residency-based students, however, had greater mean change scores. Additionally, the standard deviations for the residency-based students were higher for the pretest, posttest, and change scores indicating greater score variability around the mean among the residency-based students. Means and standard deviations resulting

from the analysis of pretest, posttest, and change scores of the traditional and residency-based groups included in this study can be found in Table 3.

In order to discover the direction of the change in scores with the traditional and residency-based clinical groups, frequencies of students responses were inspected. The mean of the traditional group pretest is 101.04 and the mean of the residency-based clinical is 117.67. The mean of the residency-based clinical group was statistically significantly higher than that of the traditional group. The data were split at a value of 120, a value close to the median score for all students. Students who achieved a score of 120 or less were placed into group 1 and students scoring 121 or higher were placed into group 2. More of the students in the residency-based clinical group scored below 120 on the pretest than the traditional students. Furthermore, there was a greater number of students in the residency-based group who scored below 120 on the posttest than the traditional students.

Table 3

*Means and Standard Deviations of Pretest, Posttest, and Total Change Scores on the Clinical Decision Making In Nursing Scale*

| | Students Receiving Traditional Instruction (n = 27) | | Students Receiving Residency-based Instruction (n = 27) | |
|---|---|---|---|---|
| | M | SD | M | SD |
| Pretest | 117.67 | 28.56 | 101.04 | 31.06 |
| Posttest | 122.37 | 32.25 | 114.37 | 34.10 |
| Total Change | 4.70 | 11.18 | 13.33 | 27.60 |

On each of the four subscale pretests and posttests, traditional students were observed to have higher means than the residency-based students. The mean change scores for the residency-based students, however, consistently were higher than those of the traditional students. With the exception of the standard deviation values for

Subscale A Posttest and Subscale D Posttest, the standard deviations of the residency-based students also were higher. Means and standard deviations of the subscale pretest, posttest, and change scores of the traditional and residency-based groups included in this study can be found in Table 4.

Table 4

*Means and Standard Deviations of Scores on the Four Subscales of the Clinical Decision Making In Nursing Scale*

| | Students Receiving Traditional Instruction (n = 27) | | Students Receiving Residency-based Instruction (n = 27) | |
|---|---|---|---|---|
| Subscale | M | SD | M | SD |
| A Pretest | 28.96 | 7.54 | 25.48 | 7.54 |
| A Posttest | 31.00 | 8.32 | 28.70 | 7.70 |
| A Change | 2.04 | 3.60 | 3.22 | 7.27 |
| B Pretest | 29.41 | 7.29 | 24.37 | 9.05 |
| B Posttest | 30.78 | 7.51 | 27.63 | 9.78 |
| B Change | 1.37 | 3.77 | 3.26 | 8.22 |
| C Pretest | 28.22 | 7.45 | 24.89 | 8.06 |
| C Posttest | 30.04 | 8.73 | 29.04 | 8.81 |
| C Change | 1.81 | 3.74 | 4.15 | 6.20 |
| D Pretest | 31.07 | 7.79 | 26.30 | 7.98 |
| D Posttest | 30.56 | 9.18 | 29.00 | 8.76 |
| D Change | -0.52 | 4.26 | 2.70 | 7.92 |

## Results of Data Analysis for Research Questions

T tests were performed for the two major research questions and for the first four minor research questions. The two groups of students compared using the independent-samples t test were independent of one another and the dependent variable was continuous. Each group contained 27 students. The sample size was large enough for the Central Limit Theorem to apply. Based on results of the Levene's test, variances of the two groups were found not to be equal, thus a Welch-Aspin test was used.

In Table 5, the difference between traditional and residency-based student achievement on the CDMNS is presented. The results indicate that there were no statistically significant differences for the total and for the subscales when the two groups of student change scores were compared.

Table 5

*Results of Independent-Samples t test, Means, and Standard Deviations for the Clinical Decision Making in Nursing Scale (CDMNS) Total Change Scores and Subscale Change Scores for 54 Nursing Students Who Did or Did Not Participate in Residency-based Clinical Instruction*

| | Students Receiving Traditional Instruction | | | Students Receiving Residency-based Instruction | | | | |
|---|---|---|---|---|---|---|---|---|
| Change Score | n | M | SD | n | M | SD | t[a] | df |
| Total | 27 | 4.70 | 11.18 | 27 | 13.33 | 27.60 | -1.51 | 34.31 |
| Subscale A | 27 | 2.04 | 3.60 | 27 | 3.22 | 7.27 | -0.76 | 38.02 |
| Subscale B | 27 | 1.37 | 3.77 | 27 | 3.26 | 8.22 | -1.09 | 36.50 |
| Subscale C | 27 | 1.81 | 3.74 | 27 | 4.15 | 6.20 | -1.67 | 42.72 |
| Subscale D | 27 | -0.52 | 4.26 | 27 | 2.70 | 7.92 | -1.86 | 39.90 |

[a]Welch-Aspin test used as assumption of homogeneity of variances was violated.

*Research Question #1*

To what extent is there a change in Clinical Decision Making in Nursing Scale (CDMNS) scores from pretest to posttest after student participation in a residency-based clinical course?

A dependent-samples t test was performed to assess if CDMNS scores changed after students participated in their clinical course. A statistically significant difference at the .05 level for students in the residency-based clinical group was found, $t(26) = -2.51$. The effect size was computed using the difference between two means divided by the pooled standard deviation for those means 13.33/27.60 = .48

(see Table 3). The resulting Cohen's d of .48 indicates a medium-size nonoverlap of 27.4% in the two distributions.

*Research Question #2*

To what extent is there a difference in CDMNS change scores for students in a residency-based clinical course and students in a traditional instructor-focused clinical course?

Due to the heterogeneity of variances of the residency-based and traditional clinical groups, the Welch-Aspin t test comparing the means of the change scores for the two traditional and residency-based groups was performed. No statistically significant difference was found between the change scores of the residency-based and traditional clinical group, $t(52) = -1.51$. The standard deviation, however, for the traditional group (SD = 11.18) and the residency-based clinical group differed greatly (SD = 27.60). There was a much higher level of variability in change scores with the residency-based clinical group.

Overall, the traditional students scored higher on the pretest but did not demonstrate improvement on the posttest. Alternately, residency-based students scored lower on the pretest but ultimately showed improvement on the posttest. Change score distribution showed greater variation and a larger number of outliers for the residency-based students than the traditional students. The distributions of the pretest, posttest, and change scores for the traditional and residency-based students can be seen in Figure 1.

In order to investigate the large variance in change scores for the residency-based group, the group was separated into those attending the West-coast university

and those attending the Southeastern university. Inspection of the means and standard deviations in Table 6 reveals that the change score mean for the Southeastern students

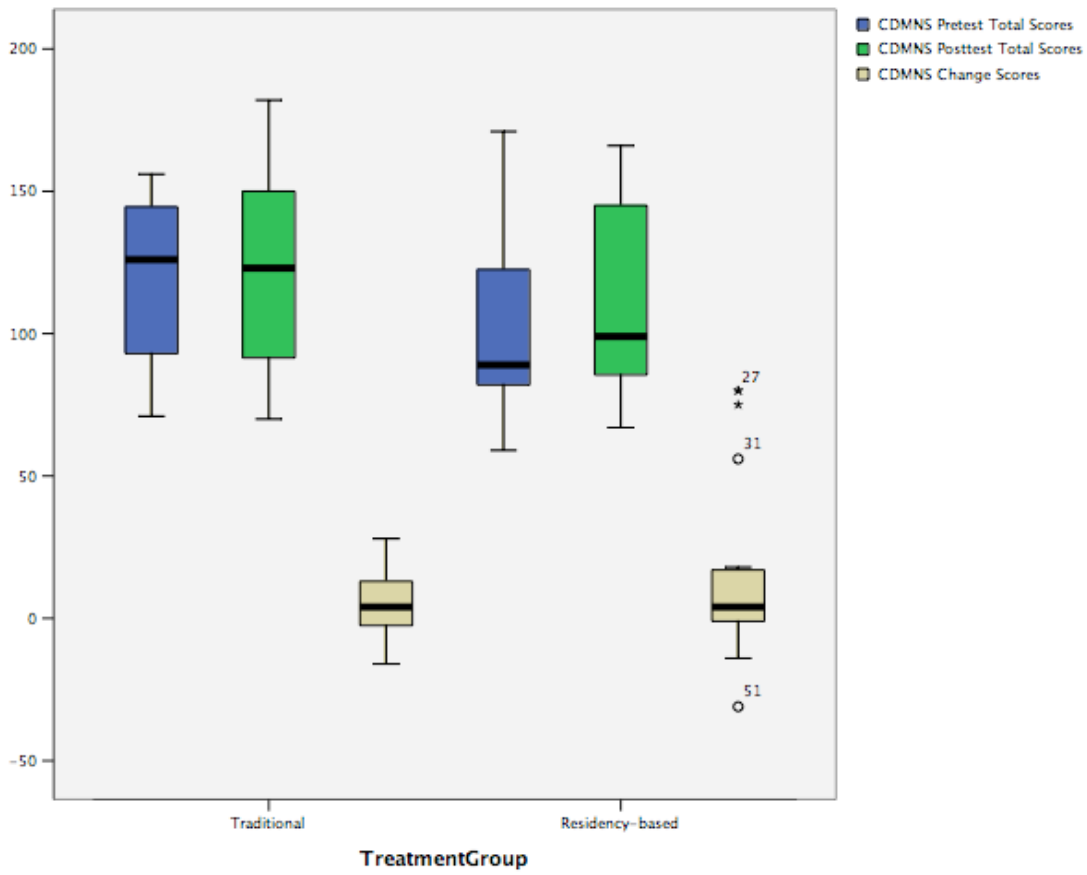


*Figure 1*. Distributions of Pretest, Posttest, and Change Scores for Traditional and Residency-based Students.

is almost eight times as large as the mean change for the West-coast students. Because of the large difference in the variances, a Welch-Aspin test was performed comparing the change scores for the two residency groups. Although not statistically significant, the small sample sizes may have resulted in little power to detect a statistically significant difference. The two groups did not respond in the same manner to the residency-based clinical education.

Table 6

*Results of Independent-Samples t test, Means, and Standard Deviations of Total Change Scores for Students Participating in the Residency-based Clinical at the West-coast University and the Southeastern University*

| | West-coast University Students | | | Southeastern University Students | | | | |
|---|---|---|---|---|---|---|---|---|
| Score | n | M | SD | n | M | SD | t[a] | df |
| Total Change | 14 | 3.14 | 12.58 | 13 | 24.31 | 35.04 | -2.06 | 14.85 |

[a]Welch-Aspin test used as assumption of homogeneity of variances was violated.

*Minor Research Question #1*

To what extent is there a difference in the CDMNS Subscale A (Search for Alternatives or Options) change scores for students in a residency-based clinical course and students in a traditional instructor-focused clinical course?

*Minor Research Question #2*

To what extent is there a difference in the CDMNS Subscale B (Canvassing of Objectives and Values) change scores for students in a residency-based clinical course and students in a traditional instructor-focused clinical course?

*Minor Research Question #3*

To what extent is there a difference in the CDMNS Subscale C (Evaluation and Reevaluation of Consequences) change scores for students in a residency-based clinical course and students in a traditional instructor-focused clinical course?

*Minor Research Question #4*

To what extent is there a difference in the CDMNS Subscale D (Search for Information and Unbiased Assimilation of New Information) change scores for students in a residency-based clinical course and students in a traditional instructor-focused clinical course?

Minor research questions 1 though 4 deal with change scores on each of the four CMDNS subscales. A Welch-Aspin t test was used for each of the questions as homogeneity of variances was not met. No statistically significant differences were identified for any of the four minor research questions. In Table 7 the difference between traditional and residency-based student achievement on the CDMNS subscale change scores is presented.

Because the residency-based students had the larger standard deviations for each of the four subscales, the total group was divided into the two separate university groups. The resulting means, standard deviations, and Welch-Aspin test results are found in Table 7. The same pattern of difference in the means and standard deviations can be observed as was found for the total change (Table 6). When the overall error rate is controlled at the .05 level, there are no statistically significant differences between the two groups for the subscales.

Table 7

*Results of Independent-Samples t test, Means, and Standard Deviations of Subscale Change Scores for Students Participating in the Residency-based Clinical at the West-coast University and the Southeastern University*

| | West-coast University Students | | | Southeastern University Students | | | | |
|---|---|---|---|---|---|---|---|---|
| Change Score | n | M | SD | n | M | SD | t[a] | df |
| Subscale A | 14 | 0.57 | 5.52 | 13 | 6.08 | 8.04 | -2.06 | 21.07 |
| Subscale B | 14 | 0.14 | 3.92 | 13 | 6.62 | 10.30 | -2.13 | 15.19 |
| Subscale C | 14 | 2.29 | 3.71 | 13 | 6.15 | 7.74 | -1.64 | 16.95 |
| Subscale D | 14 | 0.14 | 4.05 | 13 | 5.46 | 10.11 | -1.77 | 15.53 |

[a]Welch-Aspin test used as assumption of homogeneity of variances was violated.

*Minor Research Question #5*

To what extent do nursing students participating in the residency-based clinical education model and in a traditional instructor-focused program differ in their satisfaction with the experience?

Responses addressing this research question were gathered from student completion of the Satisfaction with Clinical Instructor and Satisfaction with Preceptor Tool (Appendixes A and B). Upon inspection of the frequency data of the responses to each of the nine satisfaction questions, it was observed that there were far fewer responses in the "Strongly disagree," "Somewhat disagree," and "Middle" categories than in the "Somewhat agree" and "Strongly agree" categories. For the purpose of statistical analysis, in order to meet the assumptions for the chi-square test, responses in the first two categories were collapsed into the "Middle" category. A chi-square test was performed on each of the satisfaction measures to assess for differences between the traditional group and the residency-based group. There were no statistically significant differences found for any of the satisfaction items. Frequencies of student responses for the "Strongly agree," "Somewhat agree," and "Middle" categories and chi-square values are shown for each item in Table 8. Although not statistically significant, the traditional students had proportionally greater "Strongly agree" responses than the residency-based students.

*Minor Research Question #6*

To what extent is there a relationship between age and student change scores on the CDMNS and CDMNS subscales?

Table 8

*Frequency of Traditional and Residency-based Student Responses to Evaluation Tool Satisfaction Items*

| Item | Chi-square value $\chi^2(2, N = 54)$ | Type of Instruction | Strongly Agree f | Strongly Agree % | Somewhat Agree f | Somewhat Agree % | Middle and Disagree f | Middle and Disagree % |
|---|---|---|---|---|---|---|---|---|
| | | Traditional | 13 | 48.15 | 9 | 33.33 | 5 | 18.52 |
| 1 | 0.210 | Res-based | 7 | 25.92 | 11 | 40.74 | 9 | 33.33 |
| | | Traditional | 21 | 77.78 | 3 | 11.11 | 3 | 11.11 |
| 2 | 0.004 | Res-based | 9 | 33.33 | 7 | 25.92 | 11 | 40.74 |
| | | Traditional | 21 | 77.78 | 3 | 11.11 | 3 | 11.11 |
| 3 | 0.002 | Res-based | 8 | 29.63 | 9 | 33.33 | 10 | 37.04 |
| | | Traditional | 16 | 59.23 | 7 | 25.92 | 4 | 14.81 |
| 4 | 0.020 | Res-based | 6 | 22.22 | 10 | 37.04 | 11 | 40.74 |
| | | Traditional | 17 | 62.96 | 6 | 22.22 | 4 | 14.81 |
| 5 | 0.020 | Res-based | 7 | 25.92 | 10 | 37.04 | 10 | 37.04 |
| | | Traditional | 22 | 81.48 | 2 | 7.41 | 3 | 11.11 |
| 6 | 0.002 | Res-based | 9 | 33.33 | 8 | 29.63 | 10 | 37.04 |
| | | Traditional | 19 | 70.37 | 4 | 14.81 | 4 | 14.81 |
| 7 | 0.005 | Res-based | 7 | 25.92 | 10 | 37.04 | 10 | 37.04 |
| | | Traditional | 17 | 62.96 | 6 | 22.22 | 4 | 14.81 |
| 8 | 0.004 | Res-based | 5 | 18.52 | 12 | 44.44 | 10 | 37.04 |
| | | Traditional | 16 | 59.23 | 7 | 25.92 | 4 | 14.81 |
| 9 | 0.400 | Res-based | 11 | 40.74 | 10 | 37.04 | 6 | 22.22 |

When the frequency distribution for age was inspected, the majority of the participants placed in the three middle categories, 19 to 25 years old, 26 to 30 years old, and 31 to 40 years old. The two end-value categories, 18 years old or less (n = 1), and 41 years old or more (n = 2), were collapsed inward into the next age category. A univariate analysis was used to discover the extent of the relationship between age and student change scores on the CDMNS and each of the four CDMNS subscales. Descriptive statistics for the total and subscale change scores are grouped by age and presented with the correlation ratio for each change score in Table 9.

Table 9

*Means, Standard Deviations, and Correlation Ratios for the CDMNS Total Change Scores and Subscale Change Scores Grouped by Age*

| | 25 years old or less | | | 26 to 30 years old | | | 31 years old or more | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Change Score | n | M | SD | n | M | SD | n | M | SD | Eta |
| Total | 37 | 3.70 | 11.39 | 9 | 24.78 | 35.57 | 7 | 15.71 | 30.61 | .39 |
| Subscale A | 37 | 1.46 | 4.53 | 9 | 6.56 | 8.08 | 7 | 3.71 | 6.70 | .34 |
| Subscale B | 37 | 1.08 | 3.82 | 9 | 6.78 | 10.93 | 7 | 3.43 | 8.60 | .37 |
| Subscale C | 37 | 1.81 | 3.76 | 9 | 6.56 | 8.50 | 7 | 4.29 | 5.31 | .35 |
| Subscale D | 37 | -0.65 | 3.90 | 9 | 4.89 | 8.95 | 7 | 4.29 | 10.66 | .38 |

Resulting eta values were large thus a strong correlation was evident between age and change scores on the CDMNS and CDMNS subscales. Students who were 26 to 30 years old had the highest means and standard deviations on total and subscale change scores compared with students from the other two age groups. Students who were 31 years old or more had greater means and standard deviations on total and subscale change scores compared with students who were 25 years old or less.

*Minor Research Question #7*

To what extent is there a relationship between amount of clinical experience outside of nursing school and student change scores on the CDMNS and CDMNS subscales?

Upon inspection of the frequency data for clinical experience responses, it was observed that only 3 students out of 54 had 2 to 3 years of clinical experience. No students had duration of experience in the latter two categories, “4 to 5 years” and “more than 5 years.” The majority of the students (n = 51) had either less than 6 months or 6 months to one year of experience. For purposes of data analysis, the students who had 2 to 3 years of clinical experience were collapsed into a 6 months to

3 year category, thus creating a dichotomous variable for duration of clinical experience responses, so that the point biserial correlation was used. Table 10 shows descriptive statistics and point biserial correlations for student change scores and the amount of student clinical experience outside of nursing school.

Table 10

*Point Biserial Correlations for the CDMNS Total Change Scores and Subscale Change Scores Grouped by Amount of Student Clinical Experience Outside of Nursing School*

| | Less Than 6 Months of Clinical Experience | | | 6 Months to 3 years of Clinical Experience | | | Point |
|---|---|---|---|---|---|---|---|
| Change Score | n | M | SD | n | M | SD | Biserial |
| Total | 36 | 13.19 | 24.37 | 14 | -1.64 | 7.63 | -.31* |
| Subscale A | 36 | 3.75 | 6.38 | 14 | 0.36 | 3.15 | -.26 |
| Subscale B | 36 | 3.47 | 7.05 | 14 | -0.50 | 4.20 | -.27 |
| Subscale C | 36 | 4.06 | 5.82 | 14 | 0.29 | 2.20 | -.32* |
| Subscale D | 36 | 1.92 | 7.35 | 14 | 0.88 | 6.64 | -.25 |

*Correlation is statistically significant at the .05 level (2-tailed).

Responses were obtained from 50 students. Results show that there are statistically significant inverse correlations between total change scores and Subscale C change scores and the amount of clinical experience outside of nursing school. Students with less than 6 months of experience had the greater change in total and subscale change scores.

*Minor Research Question #8*

To what extent is there a difference in the student ratings of the instructor in the traditional clinical course and the student ratings of the preceptors in the residency-based clinical course?

Upon inspection of the response frequencies for satisfaction item 10, “Overall, I rate my preceptor (clinical instructor) as a good clinical teacher,” it was seen that

only one response specified "Strongly disagree" and two responses were given for "Somewhat disagree." Therefore, for purposes of statistical analysis, these three responses were collapsed into the "Middle" category. In order to assess if differences existed between ratings of clinical instructors and preceptors, a chi-square test was performed. The test indicated no statistically significant difference between traditional and residency-based clinical course students. Although not statistically different, the traditional students had proportionately more "Strongly agree" responses than the residency-based students, whose responses were "Somewhat agree" and "Middle." Frequencies of student responses for the "Strongly agree," "Somewhat agree," and "Middle" categories and chi-square value are shown for item 10 in Table 11.

Table 11

*Frequency of Traditional and Residency-based Student Responses to Satisfaction with Clinical Instruction*

| Item | Chi-square value $\chi^2(2, N = 54)$ | Type of Instruction | Strongly Agree f | Strongly Agree % | Somewhat Agree f | Somewhat Agree % | Middle and Disagree f | Middle and Disagree % |
|---|---|---|---|---|---|---|---|---|
| | | Traditional | 19 | 70.37 | 4 | 14.81 | 4 | 14.81 |
| 10 | 0.21 | Res-based | 7 | 25.92 | 11 | 40.74 | 9 | 33.33 |

*Qualitative Data*

Question 11 on the Satisfaction with Clinical Instructor and Satisfaction with Preceptor Tool asked "My preceptor (clinical instructor) used the following techniques to help me understand clinical situations:" Themes were identified and separated into two categories: students who were preceptored and students who participated in the traditional clinical experience. A nursing faculty member was

asked to review the qualitative comments and validate that the identified themes were appropriate. Table 12 presents the themes that emerged and the frequency that comments made by students supported these themes. For some themes both groups had responses, but, for three themes each, the groups had no responses.

In support of the theme "Discussion of specific patient cases in rounds or postconferences helped to clarify clinical concepts," students relayed such statements as, "Made rounds during our clinicals to discuss our patients and their care. Had constructive and productive post confrances (sic)," and "Having post conference helped to discuss issues/concerns we had and he helped me think more in depth about situations from a nursing point of view."

Regarding the theme "Students appreciated being encouraged to apply clinical knowledge through practice with skills and assessment," representative comments included, "Allowing me to be hands on and do things under his/her (our preceptors changed weekly) supervision and guidance," and "went out of his/her way to give me a chance to practice skills (i.e. dressing change on another nurse's patient)."

Students illustrated the theme, "Students found that having to articulate a rationale for their clinical actions was beneficial," by making statements such as, "asks me questions all the time...why are you doing this? Can you explain why you would give that medication?" "She would also draw the answer that I needed from my own knowledge instead of feeding me hers," and "She asked me first what I should do in a situation before giving me the answer, so that I could develop problem solving skills." Student statements relating to the theme, "Lack of a consistent

preceptor and continuity with clinical experience negatively impacted student learning," included "sometimes my preceptor was overwhelmed with patients

Table 12

*Frequency of Identified Themes for Students in the Traditional Group and the Residency-based Group*

| Theme | Traditional Group n | Residency-based Group n |
|---|---|---|
| Discussion of specific patient cases in rounds or postconferences helped to clarify clinical concepts | 2 | 2 |
| Students appreciated being encouraged to apply clinical knowledge through practice with skills and assessment | 2 | 6 |
| Students found that having to articulate a rationale for their clinical actions was beneficial | 5 | 2 |
| Lack of a consistent preceptor and continuity with clinical experience negatively impacted student learning | 0 | 7 |
| Preceptors explicitly talking through procedures and giving rationales for care facilitated deeper student understanding of patient care | 0 | 8 |
| Students found resources (visual, written) provided by the preceptor helpful | 0 | 4 |
| Clinical instructors explicitly talking through procedures and giving rationales for care facilitated deeper student understanding of patient care | 4 | 0 |
| Expectation that student think like a nurse improved student understanding of clinical care | 2 | 0 |
| Clinical instructors helped student to see the patient holistically | 3 | 0 |

and I felt that she may have resented her role as a preceptor," and "Different clinical instructors every day. No continuity. Most were not sure of my objectives or how to help."

Supporting the theme, "Preceptors explicitly talking through procedures and giving rationales for care facilitated deeper student understanding of patient care,"

student statements included, “Talking through procedures before, during, and after,” “Everything was explained clearly. Concepts were demonstrated using examples in the clinical setting,” and “Demos and explanation of everything; she was consistently communicating with us.”

Regarding the theme, “Students found resources (visual, written) provided by the preceptor helpful,” supporting statements included, “She drew me pictures of concepts to help describe things better. She gave multiple reading materials that were plainly written to facilitate learning,” and “Drawings, models, hospital records.”

Student comments illustrating the theme, “Expectation that student think like a nurse improved student understanding of clinical care,” included “talked to me as if i (sic) was a real nurse which made me nervous at first but eventually helped me gain confidence in my abilities,” and “he helped me think more in depth about situations from a nursing point of view.”

Student statements supporting the theme “Clinical instructors helped student to see the patient holistically,” included “She forced me to think critically and think of the patient as a whole,” and “She encouraged us to look at the overall picture of our client's health and understand why certain interventions and medications were chosen for the patient.”

Four common themes were identified for both the residency-based and traditional clinical groups: discussion of specific patient cases in rounds or postconferences helped to clarify clinical concepts, students appreciated being encouraged to apply clinical knowledge through practice with skills and assessment, preceptors or clinical instructors explicitly talking through procedures and giving

rationales for care facilitated deeper student understanding of patient care, and students found that having to articulate a rationale for their clinical actions was beneficial. The themes that were specific to the residency-based clinical groups indicated a wider range of techniques perhaps due to the increased variability of preceptor techniques and abilities. Students in this group stated that, when the residency-based program was proceeding the way it was intended with one main nurse preceptor over the course of the semester, the techniques that were employed to help students understand clinical situations were effective in promoting critical thinking. A main challenge for the residency-based group, however, was the inconsistency in the preceptored experience as evidenced by student comments. The comments that were unique to the traditional clinical group demonstrated that the expectation that students think like a nurse and encouragement to treat the patient as a whole were central themes.

## Interview

Preceptor Training Evaluation tools were distributed to nurse preceptors at the West-coast site where the residency-based clinical occurred. Preceptors were identified by the faculty member who coordinated and supervised the residency-based clinical group in the Fall 2007 semester, and surveys were distributed to preceptors by a different clinical faculty member teaching a group of clinical students on the same hospital units in Spring 2008 semester. In response to a zero-response rate for the Preceptor Training Evaluation tools, three preceptors working one of the units where students completed their residency-based clinical rotation were approached for information on the reasons for not completing the survey. The contact information for

the three preceptors was provided by the faculty member who supervised the West-coast residency-based clinical group in the Fall semester of 2007. An email was sent to the three preceptors and a response from one preceptor was received. On July 31, 2008, the researcher met with the preceptor to elicit feedback on the preceptoring experience.

When asked if she had received the original Preceptor Training Evaluation tool, the preceptor stated she had but was busy at work and had not had time to complete it. The preceptor, who was under age 25, Baccalaureate-prepared and had one-and-a-half years of nursing experience, agreed to discuss the survey during our meeting. When discussing the preceptor-training workshop and the implementation of the preceptored-instruction model, four themes emerged: the pedagogical competencies provided by the workshop, clear goals for the student's experience outlined in the workshop, ways in which the nurse manager could support consistent precepting of students, and nurse manager assistance in scaffolding the learning experience for students through management of patient load.

Regarding the training workshop provided by faculty from the university where the nursing students were enrolled, the preceptor said she found most helpful the discussion of the developmental level of the nursing students and the most effective teaching methods to support students' skill acquisition and critical-thinking ability. Clear direction regarding the competencies students should have by the end of the precepted semester was also found to be valuable.

A main challenge the preceptor identified in the workplace was the difficulty of the preceptors maintaining a consistent work schedule in which they were always

there on the day of the week that the nursing students were on the unit. Students did not have flexibility in their clinical schedules, attending clinical on one day per week, and their schedule did not coincide consistently with that of their preceptors. The preceptor stated that the nurse manager could demonstrate more support for residency-based clinical education by creating staffing schedules for preceptors that mirrored that of their assigned students. The preceptor acknowledged, however, that this arrangement is not always feasible when most nurses work rotating days within a 2-week period.

The preceptor also stated that nurse management could help support the precepting process by assigning a lighter patient-care load to the preceptor at the beginning of the semester when the preceptored student required a high level of support and supervision. The preceptor's patient load could return to unit levels as the student gained proficiency and independence.

## Summary

The data gathered over two academic semesters from seven different clinical groups showed that CDMNS scores changed from pretest to posttest after participation in a residency-based clinical course. There were no statistically significant differences on CDMNS change scores between students in the residency-based clinical course and those in the traditional clinical course. There was a greater change seen from pretest to posttest in the residency-based group when compared with the traditional group. Overall, the traditional students scored lower on the pretest but demonstrated greater improvement on the posttest. When the residency-based group was divided into the two groups based on which university the students

were attending, the large standard deviations for the change scores were attributed to those students of the Southeastern university. The residency-based students scored higher on the pretest but ultimately lower on the posttest. Statistical analysis examining change scores for each of the four subscales showed that no statistically significant differences between students in the residency-based and traditional clinical course were identified. The same pattern of change found for the total was found for the two groups of residency-based students on the subscales. Those students had the higher means change scores than those students at the West-coast university.

Results addressing traditional and residency-based student satisfaction with the clinical experience showed no statistically significant differences. When looking at the relationship between age and student change scores on the CDMNS and CDMNS subscales, a strong level of correlation was seen although increasing age did not consistently correlate with greater change scores. Upon examination of the relationship between amount of clinical experience outside of nursing school and CDMNS and CDMNS subscale change scores an inverse relationship between the two variables was evident. Data analysis for students' ratings of the clinical instructor in traditional clinical courses and preceptors in the residency-based clinical course did not show a statistically significant difference between the traditional and residency-based clinical groups. Qualitative data obtained from an interview with an identified preceptor was used to provide insight for the minor research question looking at satisfaction with preceptor training.

# CHAPTER V

# SUMMARY, LIMITATIONS, DISCUSSION, RECOMMENDATIONS, AND IMPLICATIONS

The purpose of the study was to compare the clinical decision-making competencies of students who participated in a residency-based clinical-education program with students who were prepared using the traditional instructor-led clinical group after completion of a one-semester clinical course. Students also evaluated their satisfaction with their clinical instructor or preceptor and overall clinical experience. Additionally, one preceptor was interviewed regarding satisfaction with preparation she received in order to work with students in the clinical setting. The relationship of such variables as prior clinical experience and student age with perceived competency in clinical decision making also was assessed.

Data were gathered over a two-semester period from nursing students in two separate universities in order to assess if participation in a residency-based clinical course related to students' perceived clinical decision-making abilities. Students also were surveyed in order to assess satisfaction with their clinical experience and clinical instructor or preceptor. Furthermore, the relationship of two demographic factors, age and amount of clinical experience outside of nursing school, were examined with regard to the relationship with Clinical Decision Making in Nursing Scale (CDMNS) scores. Two major and nine minor research questions guided the data-collection process. In this chapter, a summary of the research and study limitations are presented. A discussion of results is included in order to facilitate understanding of the meaning and context of the findings. Research findings also are discussed with

regard to previous research on clinical decision making and are linked to the major theoretical framework in this area of study. Finally, implications and recommendations for future research and for clinical practice are presented.

## Summary of Results

To address the first major research question that dealt with the extent there was a change in CDMNS scores from pretest to posttest after student participation in a residency-based clinical course, a paired-samples t test was used. Findings indicated a statistically significant difference between pretest and posttest scores for students who completed a residency-based clinical course.

For the second major research question that dealt with the extent there was a difference in CDMNS change scores for students in a residency-based clinical course and students in a traditional instructor-focused clinical course, a Welch-Aspin t test was used as a Levene's test showed there to be unequal variances. No difference was found between change scores or subscale scores of traditional and residency-based-clinical-group students. Inspection of the means, when the residency-based students were separated into those attending the West-coast university and those attending the Southeastern university, revealed that the change score mean for the Southeastern students was almost eight times as large as the change score mean for the West-coast university. Due to the large difference in variances of the two groups, a Welch-Aspin test was used to compare mean change scores. No statistical significance was found, although the small sample size may have resulted in little power to detect a statistically significant difference.

Each of the first four minor research questions dealt with the extent to which there was a difference in the change scores for students in a residency-based clinical course and students in a traditional instructor-focused clinical course for each subscale. The four subscales are Subscale A (Search for Alternatives or Options), Subscale B (Canvassing of Objectives and Values), Subscale C (Evaluation and Reevaluation of Consequences), and Subscale D (Search for Information and Unbiased Assimilation of New Information). Inspection of the descriptive data of the traditional and residency-based groups using a Levene's test showed there to be unequal variances thus a Welch-Aspin test was used. Use of this statistical procedure resulted in no statistically significant differences between traditional and residency-based students on any of the subscales.

As with the total change score, larger standard deviations were found with the residency-based groups on each of the four subscales. The residency-based group was divided into students from the West-coast university and the Southeastern university in order to investigate from which group came the greater variability. The same pattern of difference in the means and standard deviations was found on the subscale change scores as was found on the total change scores, although there was no statistically significant difference between the West-coast and Southeastern university students based on results of the Welch-Aspin test.

To examine the fifth minor research question, the extent to which nursing students participating in the residency-based clinical education model and in a traditional instructor-focused program differ in their satisfaction with the experience, frequencies were obtained, and a chi-square test was used in order to

assess for differences in the responses given by the two groups of students. Based on the analysis of the frequencies of the response data, the majority of responses fell into two of the five categories: "Somewhat agree" and "Strongly agree." For purposes of data analysis, responses of "Strongly disagree," "Somewhat disagree," and "Midddle" were collapsed into the "Middle" category. A chi-square test was performed on each of the satisfaction measures to assess for differences between the student groups.

Findings indicated no statistically significant differences by group on the first satisfaction item, "My preceptor (clinical instructor) explains clinical techniques clearly." Furthermore, there were no statistically significant differences found between the traditional and residency-based clinical groups for the second satisfaction item, "My preceptor (clinical instructor) demonstrates concern for my learning." No difference existed either for the third satisfaction item, "My preceptor (clinical instructor) helps provide a positive learning environment," fourth satisfaction item, "My preceptor (clinical instructor) contributes to my understanding of the whole patient," and fifth item, "My preceptor (clinical instructor) is a good nursing role model." Additionally, the results of the chi-square test for the sixth satisfaction item, "My preceptor (clinical instructor) supports and encourages my learning," seventh satisfaction item, "Working with my preceptor (clinical instructor) allows me to meet the course objectives," and eighth satisfaction item, "The clinical experiences meet my learning needs for this course," indicated that there were no significantly significant differences between groups. The results of the chi-square test for satisfaction item nine, "Working with my preceptor gives me greater confidence in

working in the clinical setting," did not show any statistically significant differences between groups.

For the sixth research question, the extent of the relationship between age and student change scores on the CDMNS and CDMNS subscales, frequencies for student age groups and correlation ratios were obtained. As, the frequency distribution for age revealed that the majority of the participants placed in the three middle age categories, 19 to 25 years old, 26 to 30 years old, and 31 to 40 years old, the two end-value categories, 18 years old or less (n = 1), and 41 years old or more (n = 2), were collapsed inward into the next age category. A univariate analysis was used to obtain eta-squared values, and from that correlation ratios (eta) were computed. Results showed eta values ranging from .34 to .39, indicating a strong correlation between age and change scores. Students who were 26 to 30 years old produced the highest means and standard deviations on total and subscale change scores compared with students who were 31 years old or more and 25 years old or less.

The seventh minor research question, dealing with the extent of the relationship between amount of clinical experience outside of nursing school and student change scores on the CDMNS and CDMNS subscales, was addressed using frequencies and correlation ratios. Frequency data for clinical experience responses showed that the vast majority of students had either less than 6 months or 6 months to 1 year of experience. A dichotomous variable, therefore, was created to facilitate data analysis. Descriptive statistics and point biserial correlation ratios were computed. Results indicated statistically significant inverse correlations between total change scores and Subscale C change scores and the amount of clinical experience outside of

nursing school. Students with less than 6 months of experience demonstrated a greater change in total and subscale change scores than students with 6 months to 3 years of experience.

To address the eighth minor research question, the extent of the difference in the student ratings of the instructor in the traditional clinical course and the student ratings of the preceptors in the residency-based clinical course, frequencies were obtained and a chi-square test was used. Response frequencies for satisfaction item ten, "Overall, I rate my preceptor (clinical instructor) as a good clinical teacher," showed only one response specified "Strongly disagree" and two responses specified "Somewhat disagree." These two categories, therefore, were collapsed into the "Middle" category, resulting in three remaining categories. A chi-square test was performed and results indicated no statistically significant difference between traditional and residency-based clinical course students.

In order to examine the extent that preceptors indicate that the preceptor training prepared them for their work with nursing students, qualitative data were obtained from an interview with an identified preceptor providing insight into preceptor satisfaction with the preceptor-training process. One key point made by the nurse preceptor was the value of the preceptor training workshop presented by the School of Nursing in which the precepted students were enrolled. From the workshop, the preceptor gained valuable information regarding desired outcomes for the semester-long clinical course and for the residency-based clinical experience on the whole. She also was able to gain an understanding of the developmental level of the nursing student population with whom she would be working and be aware of the

most effective pedagogical methods for preparing students in the clinical setting. The nurse preceptor also spoke of the importance of nurse-manager support for consistent shift scheduling and a scaffolded assigned patient load when nurses were precepting students. The preceptor identified much of the lack of consistency for students in working with the same nurse over the course of the semester as due to scheduling conflicts.

## Limitations

This study had a number of limitations. First, the clinical groups that determine the type of clinical education in which the students participated were not assigned randomly. Differences in the CDMNS scores, therefore, may have been attributable to selection bias and existing differences among the students. Although all students at the Southeastern university participated in an established residency-based clinical, students at the West-coast university had the opportunity to choose participation in the residency-based clinical. Because there was only one residency-based clinical group per semester, the opportunity for this experience was limited. The results of the pretest analysis show that self-selection, however, did not create statistically significant differences among the clinical groups. There was evidence of heterogeneity in the sample as participating students came from both first- and second-Bachelor degree nursing programs. All students from the West-coast university were first-degree students whereas participating students from the Southeastern university were drawn from a pool of first- and second-Bachelor degree students. It was not known until after the posttest was completed that students at the Southeastern university comprised two different types of BSN students, therefore,

data identifying type of degree were not collected. All students, however, were entering the hospital in their clinical rotations for the first time. Again, no statistically significant differences were found between groups on the pretest.

Second, although based on findings from the literature, the CDMNS artificially breaks the decision-making process into subprocesses that may not reflect authentic decision-making practices. The CDMNS presumes that nursing students engage in rational decision-making processes even when a rational approach may not be time or situation appropriate. Conscious decision making, however, may be appropriate for the level of competency of this study's participating nursing students. As outlined by Benner's (1982) novice-to-expert theoretical framework, for students at this level of clinical competency (novice and advanced beginner), decision making is still a deliberate process. It is not until the advanced stage (expert) that intuition is used routinely for clinical judgment.

Third, formal testing of the CDMNS by Jenkins (1985a) showed there to be no statistically significant difference in total scores among class levels of nursing students. The absence of difference may be due students not perceiving themselves as decision makers due to the traditional clinical environment in which they are placed. Perhaps clinical-education environments unwittingly do not promote opportunities for decision making (Waltz & Jenkins, 2001). Each course was one semester long, which may or may not be sufficient time for students to demonstrate statistically significant improvements in their decision-making competencies.

Finally, the CDMNS does not provide an objective measure of clinical decision-making performance. Instead it focuses on students' self-perception of the

decision-making process. Thus, it is possible that students may not perceive accurately their own clinical-decision-making ability. Jenkins (1985a) focused on self-perception as it correlates with behavior, stating that students with strong perceptions of themselves were more able to examine objectively new information for relevance and integrate the information appropriately. Based on self-perception theory, students' perceptions, if accurate, can be a strong indicator of their clinical-decision-making performance.

## Discussion

Findings for the first major research question that dealt with the extent there was a change in CDMNS scores from pretest to posttest after student participation in a residency-based clinical course indicated a statistically significant difference. According to the anticipated progression of clinical competency outlined by Benner (1982), improvement on CDMNS scores should be expected after students have completed a semester-long clinical practicum. When the scores were analyzed for change over the semester, however, it was noted that, although the scores differed, student scores did not always improve. If fact, scores for some students decreased after completion of the one-semester clinical course. The decrease was especially marked for students who scored high on the pretest. For these students, the clinical experience may have been a leveling experience in which the perception of a high level of decision-making competency was diminished due to the challenges and experiences of actual clinical work. The students may have entered the clinical setting with a misconception about the nature of clinical work and their role within that environment. When faced with providing skilled patient care in a fast-paced,

high acuity setting, the perceived competency these students had about their own ability to make decisions may have lessened.

Findings by White (2003) showed that, for nursing students, experience on a hospital unit was instrumental in the students "gaining confidence in their skills, building relationships with staff, connecting with patients, gaining comfort in self as a nurse, and understanding the clinical picture" (p. 115). These experiences appear universal for all students regardless of whether the clinical education experience is directed by a clinical instructor or preceptor. The notion that the simply engaging in the clinical experience, as long as nurses were able to articulate their decision-making processes, helped students to develop an awareness of decision making also was supported by Higuchi and Donald (2002). Student scores on the posttest may have reflected their growing awareness of the salient features of the clinical environment and identification of the cognitive processes that supported effective patient care. Students who had little or no clinical experience prior to the clinical rotation may have had misconceptions of the roles and functions of nursing on a hospital unit and, through their experience in this clinical rotation, came to perceive their clinical decision-making competencies differently.

No difference was found for change scores or subscale scores of traditional and residency-based clinical group students for the second major research question that dealt with the extent there was a difference in CDMNS change scores for students in a residency-based clinical course and students in a traditional instructor-focused clinical course. There also were no statistically significant differences for the first four minor research questions that dealt with the extent to which there was a

difference in the change scores for students in a residency-based clinical course and students in a traditional instructor-focused clinical course for each CDMNS subscale.

Although differences among the residency-based students were not evident on the pretest, when residency-based student-posttest responses, however, were grouped according to the university the students attended, it was evident that the students from the Southeastern university had greater mean change scores and variability than students from the West-coast university. The increased change and variability may have been reflective of the heterogeneity of the student sample from the Southeastern university. Students in this group had greater variation in age and also varied in whether the Baccalaureate degree they were completing was a first or second degree.

One of the major assumptions of the study was that students who were participating in the residency-based clinical were having a manifestly different clinical experience than students in the traditional clinical education course was not realized fully upon implementation. Based on qualitative data from the evaluation forms completed by students at the end of the semester from students in both universities and from numerous comments made to the researcher upon posttest administration, the preceptored or residency-based was not implemented fully as conceptualized. Statements written on the evaluation forms addressing the gap between conceptualization and implementation included "I had many different preceptors," "Different clinical instructors every day. No continuity. Most were not sure of my objectives or how to help," and "I haven't had the same preceptor during my clinical experiences." Similar verbal comments made by students in the

residency-based group were heard by the researcher when administering the paper-based posttest.

Results of White's (2003) study emphasized how consistency in the clinical environment supports student learning. Additionally, findings from Woods and Craig (2005) argued for the creation of stronger and more sustained partnerships between academic and healthcare organizations to aid in the preparation and transition of new graduate nurses. As there is currently little discussion between these two types of organizations, the establishment of partnerships, in which there is continuous dialogue linking curriculum issues and performance data of nurses in their first year of practice, could become part of the expectation of professional nursing preparation and evaluation. Consistent work with a precepting nurse knowledgeable about the link between curriculum and requirements for effective new graduate nursing care could better prepare nursing students for entry into practice. This partnership is critical as both academic and healthcare organizations have the common goal of ensuring a supply of safe and competent professional nurses. Mallette, Loury, Keehner, and Andrews (2005) in response to the challenges of implementing a residency-based clinical proposed the Integrative Clinical Preceptor (ICP) model in which the responsibilities of the supervising faculty, the preceptor, and the student are clearly delineated. In this model, communication, goal setting, and supervision between the three key participants are continually reviewed and changes made as necessary. Lack of a consistent experience for both the residency-based group and the traditional group may have accounted for the absence of a statistically significant difference on change scores.

Findings for the fifth minor research question indicated no statistically significant differences by group on any of the nine items that dealt with student satisfaction with their clinical experience. The absence of a difference may be due to the fact that by the very nature of working with patients over the course of the semester, whether it was with a nurse preceptor or clinical instructor, students develop confidence in working in the clinical setting. It also could be true that all clinical instructors and nurse preceptors with whom students worked over the course of the semester were skilled in facilitating students' confidence in working with patients. Higuchi and Donald (2002) proposed that by the very nature of engaging in the clinical experience, students were able to develop an awareness of decision making if staff nurses were available to help guide them explicitly through the process. Girot (2000) found that nursing students exposed to the academic process have more enhanced decision-making capabilities compared with those who have not. The academic process is inherent in clinical nursing education in which there is a set curriculum with well-articulated course and program goals. The academic process is not specific, however, to preceptored students and thus traditional students also could have gained the same competencies from time spent in the clinical setting. Supporting the role of academic preparation, Hagbaghery, Salsali, and Ahmadi (2004) identified four factors in addition to nursing education that positively impacting clinical decision making: (a) feeling competent in the clinical setting, (b) being self-confident, (c) organizational structure supporting nurses' authority to make decisions, and (d) being supported by management. As these four factors have been identified explicitly, nursing education should endeavor to promote perceived competency and self-

confidence in nursing students and strive to ensure institutional support for decision making by nurses. Again, time spent in the clinical environment could help students experience these factors and thus promote clinical decision-making competencies.

Results for the sixth minor research question indicated a strong correlation between age and change scores. Students who were 26 to 30 years old produced the highest means and standard deviations on total and subscale change scores compared with students who were 31 years old or more and 25 years old or less. Hoffman, Donoghue, and Duffield (2004) found that age was a factor in frequency of decision making pointing to the possibility that greater length of experience with recognition of salient situational features and the subsequent decision-making process may influence clinical decision making. The relationship between greater age and increased frequency of clinical decision making, however, was low. The findings of this study show that greater age did not correlate consistently with higher change scores. The lack of a relationship may be due to the fact that it cannot be assumed that those who are older have more clinical experience, a factor that also should be considered for the eighth minor research question.

Statistically significant negative correlations for the seventh minor research question were found between total change scores and Subscale C change scores and the amount of clinical experience outside of nursing school. Students with less than 6 months of experience demonstrated a greater change in total and subscale change scores than students with 6 months to 3 years of experience. Similar results were found by Hoffman et al. (2004) when assessing a sample of professional nurses. The

results showed no statistically significant correlation between education level or experience and perceived decision making.

Data analysis for the eighth minor research question showed no statistically significant difference between traditional and residency-based clinical course students for student ratings of their clinical instructor or preceptor. Again, the lack of a statistically significant difference may have been due to the fact that a number of the students engaging in the residency-based model actually did not have a preceptored experience but instead worked with many different nurses over the course of the semester. For these students, the one consistent preceptor or clinical instructor may have been their supervising faculty. For students who had more than one preceptor, the responses do not make it clear which preceptor was being evaluated. The lack of clarity of these findings points to the difficulty inherent for performing research in a clinical setting. For future research, it would be beneficial to ask students the number of preceptors they had over the semester and to have students evaluate individual preceptors.

Qualitative data describing how preceptors believed that the preceptor training prepared them for their work with nursing students were obtained from an interview with an identified preceptor. The themes that emerged, the value of the preceptor training workshop, in which an understanding of the learning and developmental needs of nursing students and of the program goals is gained, and the importance of nurse-manager support for consistent shift scheduling and a scaffolded assigned patient load, are supported by findings in the literature. Charles and Goodwin (2004) found that preceptors expressed greater confidence in their teaching abilities and

more inclination to adapt teaching styles after completion of a workshop. Identification of four ways in which participation in the course would alter the preceptors' future practice included (a) "more awareness of students needs and learning styles," (b) "greater insight and therefore application of the role of preceptor," (c) "a broader knowledge base to apply in practice," (d) "greater knowledge of practical ways to support students" (p. 230). Roche (2002) found that, when implemented correctly, the preceptor-nursing student relationship was effective in helping students learn to problem solve and make clinical decisions. Not only did White's (2003) findings identify consistency as a key factor in successful development of clinical decision making but also pointed to the tension that can exist as a result of staffing and patient-load pressures. These findings lend support to the idea of a scaffolded patient load for precepting nurses. Myrick and Yonge (2004) identified specific positive preceptor behaviors to promote critical thinking in students. These behaviors included respect, flexibility, openness, safety or trust, and skepticism that prompted questioning of clinical decisions and demanded students to explicit state rationale for clinical interventions. Engaging students in a discussion of rationale for their actions, however, is not a behavior specific to preceptors. Staff nurses with whom students work, albeit in a more inconsistent manner, also can engage in this type of dialogue. The lack of specificity of who employs rationale-oriented discussion in their clinical teaching may have contributed to the absence of a statistically significant difference between the traditional and residency-based students with regard to decision making.

Although White (2003) emphasized how consistency in the clinical environment supports student learning, the consistency does not have to be necessarily consistency with the same preceptor. This consistency can come from working with a clinical instructor although the close one-to-one relationship of a precepted relationship is diminished. If consistency in the clinical experience is to be reconceptualized, consistency also can result from a nursing student working with one nurse for the entire shift and focusing on that nurse's patient load. This model is different than the current practice of students working with different nurses when students are assigned to more than one patient.

Nursing education provides the base from which nurses learn the art and science of the profession. Foundational content including health assessment, nursing interventions, pharmacology, therapeutic communication, and management of patient care shapes the core of the nursing curriculum and is necessary for safe nursing practice. Metacognitive strategies, such as awareness of how one learns best and continual self-reflection on strengths and limitations, however, also need to be given emphasis in order to facilitate life-long professional growth. Pedagogical practices that encourage explanation of rationales for actions can facilitate development of the cognitive process of decision making, especially in the clinical setting.

Graduates from a nursing program are assumed to have at least minimum competency in safe patient care. Current research shows that many students are not prepared for entering clinical practice upon graduation but instead need further on-the-job training and support (del Bueno, 2005). Results from a widely used workplace assessment, the Performance Based Development System (PBDS), show that only

35% of new registered nurses meet unit expectations for clinical judgment (del Bueno). There is little research to support the effectiveness of the current model of clinical nursing education, in which academic nursing faculty provide all clinical instruction and evaluation for a group of students (Oermann, 2004). It, therefore, is essential that innovative methods of clinical education be explored. Nursing is ultimately a "practice art" (del Bueno, 2001, p. 281), in which students must have ample opportunity to apply the knowledge learned in the classroom.

The theoretical basis for this study was the progression of nurses from novice to expert proposed by Benner (1982). According to Benner, beginning nurses, and thus nursing students, function at the novice stage. They have no experience with clinical situations and thus clinical guidance instruction is by necessity concrete and directive. Novices are task oriented and have difficulty integrating competing clinical needs into their care. As their experience grows, there is increased exposure to different clinical scenarios. At this point, nurses move to the advanced-beginner level, and there is a growing awareness of the salient aspects within clinical situations, although there is still little ability to prioritize (Benner). To support students in their progression to the advanced-beginner level, clinical education needs to be aspect-based as opposed to purely directive. Starting with a preceptored-model in which students work consistently with a skilled nurse can help facilitate the progression from novice to expert. In this model, students, with the support of a nurse preceptor who helps the student integrate salient features, can move from a fragmented view of the clinical situation to one who views the clinical situation holistically.

This study was designed to identify potential differences in perceived clinical decision-making competencies of students in an innovative preceptored model compared with students engaging in traditional clinical education. There were, however, some identified challenges of the study. These challenges were found in the assumed differences between the preceptored and traditional clinical education groups and in the difficulty around administering the same tool twice to each student and ensuring student retention. Additionally, the residency-based clinical course of one of the universities was part of an innovation program and might have faced challenges common to the implementation of any newly-implemented program. There were possible concerns around the sample size and the sensitivity of the tool used to assess perceived clinical decision-making competencies.

When conceptualized, the residency-based course would allow students the opportunity to work with one nurse preceptor over the course of the semester. This one-on-one teaching relationship was meant to facilitate student development of professional nursing skills and decision making essential to safe and effective nursing care. Students, in effect, would learn how to think like a nurse. Further benefits could be found in the ability of the nurse preceptor to know in what areas of care the student was proficient and to collaborate with the student in identifying areas of need. Ultimately, students would remain within one health-care institution for the duration of their nursing program and over the course of several semesters also would become proficient with the internal institutional policies and procedures. The clinical experience would be a scaffolded one in which students would gain independence over the course of the semester and gradually take on more of the total patient care.

The assumption made when designing the study was that the two student groups, the traditional and the residency-based clinical students, would have markedly different clinical-education experiences. Although difficult to quantify from the qualitative student comments, it is clear that some if not many of the residency-based clinical students had experiences closer to that of the traditional clinical-instructor model than a preceptored model. Seven students from the Southeastern university noted the lack of a consistent preceptor in their clinical experience. Anecdotal comments made to the researcher by students participating in the residency-based clinical at the West-coast university indicated that many of these students also experienced inconsistency in the preceptored experience. The lack of a clear difference in the experiences of the two students may account for the absence of statistically significant differences when the two groups were compared using the CDMNS.

Challenges also were evident in the difficulty around ensuring student retention when administering the CDMNS twice to each student. Particularly, using an online administration of the CDMNS in the Fall 2007 semester created further challenges to ensuring participant follow up. For both universities, not having direct access to the students with the online administration created a lack of control over the posttest follow up. At the Southeastern university, 35 students completed the pretests and 13 of those students completed the posttest. There were a number of pretests, however, completed by students who did not complete the posttest (n=12). At the West-coast university, clinical instructor investment in the research process and the ability of the researcher to follow up in person with clinical instructors with regard to

response rates helped obtain response rates of approximately 95%. In order to facilitate data collection and to reduce loss of participants to follow up, the decision was made to administer the tool and evaluations using a paper-based tool in the Spring 2008 semester. The resulting participation and follow-up rates were 100%.

The size of the sample was an additional challenge of the study. Although drawing from quite a large pool of students (n = 120) at the Southeastern university in which all students participated in the residency-based clinical, the online administration of the tool resulted in a total sample size of 13 students. In the pretest portion, 35 students chose to participate. The completed posttest in which identifiers matched pretest participants revealed a total sample size of 13 students. Three of these students were included only because, having failed to complete the online posttest, they completed a paper-based posttest mailed to the instructor in late December 2007 when it was clear that the posttest rate of participation was very small. At the West-coast university, in the Fall semester of 2007, only 7 students participated in the residency-based clinical. All of these students completed both the online pretest and posttest. Additionally, students completing a traditional clinical education course were included for evaluation. Two clinical groups were included and out of a possible 15 students, only 13 chose to participate. Ultimately, the Fall 2007 semester data collection included a total of 33 students, 20 of whom were completing a residency-based clinical education course, and 13 who were completing a traditional course.

Due to the relatively small sample size, a decision was made to extend data collection into the Spring semester. It also was decided that with the major

challenges created by long-distance data collection, the tool would be administered to traditional and residency-based clinical students solely in the West-coast university. Additionally, tool administration would be paper-based to ensure maximum student participation and posttest follow up. In the Spring, 14 (n = 5 and n = 9) students from two different traditional clinical groups and seven students from the residency-based clinical participated. As stated, participation rate was 100%. One student in a traditional group was not available for the pretest or posttest as the student was absent on both days.

One factor that may explain the difficulty in implementing the residency-based model consistently for students at the West-coast university is that the preceptored clinical model was newly created. When data were collected from the West-coast university students in the Fall 2007 semester, the innovative residency-based program only had been implemented the semester before. Therefore, it was still a new program for the School of Nursing and for the hospital in which students were placed for their clinical experience. Some issues that may have affected consistent preceptorship of students included the challenges of establishing and growing the academic-service partnership, ensuring that nurse managers understood the demands of a different type of clinical education such as staff scheduling and support for nurse preceptors over the course of the student-preceptor relationship, and ensuring faculty and students understood the goals and procedures of the new clinical program.

## Implications for Future Research

Although the study design was sound, the implementation was challenging due to various reasons previously discussed. This study provided a strong base from which future research can be pursued. A fundamental consideration that would need to be included in future research would be to ensure that the comparison groups were distinctly different in their clinical experience. Although the intent of this research was to compare perceived clinical decision-making competencies of traditional and residency-based clinical groups, there was a potential for overlap in the two clinical experiences in which the residency-based groups might have functioned more like traditional clinical groups. There is value in returning to a clinical-education model that emphasizes consistency in the clinical experience (Nelson, 2002). Indeed, there have been recommendations for more residency-based clinical-education models (Tanner, 2006).

Recommendations for future research include ensuring that the existing residency-based clinical program included for study had strong hospital-administration and nurse-manager support and that expectations for the nurse preceptors are clear. Several points that must be considered when forming an academic-service partnership include shared goals and outcomes benefiting each participant, a balanced exchange of resources, and established methods of measuring growth and success (Bleich, Hewlett, Miller, & Bender, 2004). The expectations for the nurse preceptors should include regular availability on the day or days the nursing student is scheduled to be on the unit. Nurse managers can be instrumental in facilitating appropriate staff scheduling as well as managing nurse preceptor patient

load. Scaffolding the patient load of the nurse preceptor is another key factor that should be considered when attempting to facilitate preceptor support of the learning needs of the students. For example, at the beginning of the semester when students need greater orientation and supervision, nurse preceptors could be assigned a lighter patient load than other staff nurses. As the student gains proficiency with skill and time management, the nurse preceptor's patient load could be increased to reflect that of the unit average.

There needs to be an investment of time by the nurse preceptors in learning pedagogical techniques appropriate for the nursing student with whom they are working. Identification of where students are in their clinical-skill development and in their ability to grasp and prioritize salient features of a clinical situation is key (Benner, 1982). Awareness of appropriate pedagogical techniques should be introduced in a training session for nurse preceptors and also should include nurse managers so that all invested parties are familiar with formative and summative program goals. The onus for clear communication for each of these expectations clearly lies on the school of nursing faculty supervising the residency-based experience.

Once it is clear that the residency-based clinical program is in place, continued monitoring by supervising faculty is essential. Ongoing communication with administration and individual nurse preceptors will ensure that students are receiving a consistent preceptored experience and that preceptors perceive themselves to be competent in their role and supported by faculty if questions arise. With the necessary preparation and support in place, students will receive the benefits of the

residency-based experience: enhanced socialization for student nurses, facilitation of the transition into practice, and greater student accountability (Diefenbeck, Plowfield, & Herrman, 2006). These recommendations ensure that, for future studies, students in a designated residency-based group will participate in a distinctly different clinical-education model than traditional nursing students. Differences in perceived clinical decision-making competencies thus will be more attributable to student clinical experience than inherent student differences as the clinical experiences clearly will differ between traditional and residency-based student groups.

Use of the CDMNS was beneficial in helping students to reflect on the change of their decision-making competencies in the clinical setting over the course of a semester. Although the CDMNS was used to assess change scores in this study, the CDMNS could be used potentially as a summative assessment of clinical decision making in students from different types of clinical nursing education programs. For example, graduating students from a nursing program in which all students participated in a residency-based program could be compared with graduating students who participated in a traditional clinical-education program using the CDMNS. Of course, differences between student groups would have to be accounted for as no pretest data would be available. Student performance on the CDMNS could then be analyzed for differences in total scores between groups and the extent of change scores for the CDMNS total and subscales. First-time NCLEX pass rates also could be compared for the two groups of students.

Additional recommendations for future research include use of a more controlled environment for data collection. Control could be obtained through either

a paper-based tool administration performed by the researcher or through an online administration in which all interested students completed the tool in a computer laboratory setting at the same time. Students completing an online tool also could receive ongoing encouragement to participate at specified intervals by motivated faculty members invested in the research process. If long-distance data collection were to be employed, having a designated person to help orchestrate the process and follow up at the remote site would be essential.

A main barrier to effective communication between preceptor and supervising nursing faculty identified by the nurse preceptor interviewed for this study was that nurse preceptors lack time on the job to do anything more than provide patient care and work with students. The absence of any free time was the reason given for not completing the evaluation of the preceptor training. As suggested by Mallette et al. (2005), set times for meetings where feedback is provided is essential for busy nurses. Additionally, clear expectations of type of feedback, such as evaluation of preceptor-preparation workshops or student progress, is essential for communication that is both direct and valued by both parties. Future research should outline clearly during the nurse-preceptor training that evaluation of perceived effectiveness of the training with regard to success in working with students will be carried out at the end of the semester along with student completion of the posttest and clinical experience evaluation. Setting the expectation that the evaluation is an essential part of the training process and placing the researcher on the unit to administer and collect the evaluation while the nurse preceptor is working will ensure maximum preceptor response. At the conclusion of the student-preceptor partnership, students could

identify effective nurse preceptors, and these preceptors could be interviewed using questions that address use of effective pedagogical techniques. Nurse preceptors also could provide feedback on the growth or lack of growth they observed of student nurses participating in the model. In addition, future research also could compare the difference in effectiveness of preceptors who receive training to work with students with those who do not receive training.

Ultimately, this study examines a number of critical issues within the current clinical nursing-education model. Among these issues are student perception of clinical decision-making competence and student satisfaction with the clinical experience and with their instructor or preceptor. All of these factors directly contribute to new graduate clinical competency and safety when administering patient care. It is vital that research focusing on methods of fostering clinical decision making in nursing education continues and that effective tools for the assessment of clinical decision making are developed further.

## Implications for Clinical-Nursing Education

Implications for clinical instruction include the key consideration that instruction must include consistent support by competent-level nurses that helps advanced beginners set priorities (Benner, 1982). Within the preceptored model, nurses who function at the competent-level and often above work consistently with nursing students. The arrangement, in contrast with traditional clinical education in which over the semester students may work with various nurses possessing a range of competency levels, allows for a consistently progressive clinical awareness by the student. In order to promote enhanced socialization, facilitation of the transition into

practice, and greater student accountability there needs to be a move away from the current fragmented clinical-education approach (Diefenbeck et al., 2006).

Steps in clinical decision making include the search for alternative options, information seeking and assimilation, determination of probable results from each course of action with an evaluation of related risks and benefits, consideration of viable options, and, finally, a selection and implementation of the best alternative (Jenkins, 1985b). Awareness of how students experience the cognitive process of decision making and what cognitive skills students can be expected to possess at specified levels of a nursing program can facilitate faculty support of student learning tremendously. Currently, most clinical nurse faculty do not receive adequate training on how to work with nursing students in a way that enhances clinical decision making and the ability to prioritize and synthesize salient clinical features. Regardless of the lack of formal training, some clinical nurse faculty are very adept at guiding students through the development of decision-making capabilities. Other nurse faculty, however, may not be so skilled in supporting student development. The variability in faculty skill can lead to disparate student outcomes in clinical decision making and, ultimately, clinical competency and safety.

Qualitative findings from this study underpin the importance of encouraging students to articulate rationales for their nursing interventions. Jenkins' (1985b) research reinforces this pedagogical modality. Implications for the development of effective clinical decision making could be the use of a series of prompts or questions by the clinical instructor or preceptor to promote deliberate clinical decision making. This technique also has been recommended for the development of clinical judgment

and decision making by del Bueno (2005). Creating a learning environment that is open and in which risk taking is rewarded is highly beneficial for the development of clinical decision making (Jenkins).

In order for the preceptored residency-based model to be successful, the model of the experience may need to be reconceptualized. In the past, when residency-based clinical education was the standard, hospitals expected to have nursing students on the units for the duration of the nursing program. In addition, students spent a greater amount of time in the clinical setting as programs were clinical-driven as opposed to theory-based. Staffing issues, in which incompatibility of the schedules of the nurse preceptor and the student create an inconsistent experience for the student, were not as prevalent as students worked more shifts and were more available to work with nurses on the unit. As nursing education has moved to a theory-based model, concerns around new-graduate clinical competency have surfaced. New graduate nurses have been viewed by employers, alumni, and current students and faculty as "deficient in clinical skills and judgment and [having] unrealistic expectations of the work environment" (Haas et al., 2002, p. 519). In one attempt to address these fundamental concerns, an academic-service partnership was implemented across an undergraduate curriculum. A large part of the success of the program was attributed to the fact that each nursing student was to follow the work schedule of his or her preceptor so that preceptors did not have to reschedule to accommodate their new role. That students followed their preceptors' schedule also meant that students were working all available shifts thus allowing for a more even distribution of students on a unit at any given time and for nurses working shifts other

than the day shift to serve as preceptors. Following the success of this approach and having students follow preceptors' schedules may be one solution to implementation challenges facing residency-based clinical education. This model is currently used when nursing students complete their senior-year specialty clinical rotation, and it is a feasible solution for students at all levels in the curriculum.

The residency-based model also could be reconceptualized to view nurse preceptors as the assigned nurse with whom the student is working with on any given shift. The preceptor would not have to be the same nurse each time, however. In order to maintain consistency, the nursing student would work the entire shift with one nurse and each of that nurse's patients so that the student could become aware of and, ultimately proficient with prioritization, time management, and technical skills. Essentially, within each shift, the student would have greater opportunity to model their thinking and decision making on a consistent nurse role model.

Communication between the nurse preceptor, supervising faculty, and nursing student is critical to the success of a residency-based clinical. The ICP model, in which each role of the preceptorship triad is clearly delineated, can be a model for a systematic feedback loop that ensures communication between all three members of the triad expectations (Mallette et al., 2005). As a result of formalizing the process of faculty communication with students and preceptors, a minimum number of site visits was set and items to be covered at each visit were identified. In this particular collaboration, faculty were to meet with students at least two times per semester and were to review course objectives and student progress. Time was allotted to observe the student in practice and to discuss student performance with both the preceptor and

student. That preceptor feedback was built in to the communication process was key to the success of the ICP model. One-hundred percent of participating students evaluated said that the preceptor and the preceptor experience met their expectations (Mallette et al.). Informal evaluation showed that preceptors valued the alliance with faculty created by the collaborative ICP model. Preceptors viewed faculty as experts from whom they could learn. Faculty, in turn, encouraged preceptors to pursue adjunct faculty positions as a way of further cementing the bond between clinical agencies and the school of nursing. The ICP model could be used for future residency-based clinical education as its use of formalizing the preceptor, faculty, and student relationship ensures that expectations are explicit, accountability for working within the defined roles is present, and communication is open and continuous. The ICP model presents a clear framework for effective role construction and execution. Clarity in role assumption and in communication among vested participants is paramount in both research and clinical nursing education endeavors especially when a new clinical education model is employed.

There is a need for more training for clinical nurse faculty. There is, however, also a call for schools of nursing to implement a residency-based model in which nurse preceptors receive adequate training for facilitating development of clinical decision-making competencies in students. In addition to working with nurse preceptors who have developed the necessary skill and awareness to work effectively with students, nursing students also benefit from the consistency of learning the intricate processes and cultural considerations specific to any institution.

# Conclusion

The purpose of this study was to assess differences in perceived clinical decision-making competencies between students who participated in a traditional clinical education course and students who participated in a residency-based clinical course. Changes in student scores on the CDMNS were examined over the course of a semester. The CDMNS was administered at the beginning of the semester in the first few weeks of entrance into the clinical setting and again at the end of the semester. Pretest, posttest, and change scores were analyzed to discern if differences existed between the two groups. Students also completed a survey that indicated satisfaction with their clinical experience and instructor or preceptor. Additionally, age and amount of clinical experience were examined in relation to scores on the CDMNS.

Data analysis revealed statistically significant differences for the residency-based clinical group on pretest and posttest scores, although there was no difference between CDMNS change scores or subscales for the residency-based and traditional clinical groups. Additionally, no satisfaction items showed statistically significant differences between groups. Age was found to be related with scores on the CDMNS whereas clinical experience was not found to be related.

Current nursing practice necessitates preparation of new-graduate nurses who are ready to safely and effectively care for patients as soon as they enter the workforce. Higher levels of patient acuity, increased patient load, and the steady addition of new pharmacological and technological interventions require that nurses are able to assess quickly and accurately a clinical situation and prioritize their interventions appropriately. Viewing nursing student preparation through the lens of

Benner's (1982) novice-to-expert progression helps to identify the essential qualities of clinical nursing education. Clinical endeavors that support the move from the fragmented novice view of a clinical situation to one in which students integrate and synthesize salient clinical features are necessary for the success of new-graduate nurse preparation and ultimately the survival of a competent nursing workforce.

## Afterword

There were a number of logistical challenges faced during the data-collection phase of the study. The four main difficulties were the recruitment of students when using an online tool administration, retention of students over time as change scores of students were assessed necessitating two administrations of the tool, accessing the identified preceptors for self-evaluation of their preparation to work with students, and the coordination of long-distance data collection. Regarding the online tool administration, a key challenge was the lack of control over student completion of the tool. Emails with an invitation to participate and a link to the actual online tool were sent out to individual students. Most students initially did not respond to these email invitations, and thus it was clear that encouragement and support from the students' clinical instructor was necessary to promote student involvement in the study. Ultimately, the response rate for students approached in this way was approximately 95% for the West-coast university. The researcher's ability to communicate in person with the clinical instructors was instrumental in increasing response rates. As a result of discussion with the dean of the nursing progam in the Southeast region of the country, it was agreed that the best method of distributing online survey links to the students attending was to give the link to the online survey through an online theory

class portal. Students were then encouraged to complete the survey by their theory instructor. The response rate for this type of administration was very low at approximately 29% for the pretest and 11% for the posttest.

Retention of students over time was necessary for gathering change scores for each participant. The major challenge in retention came with online administration. Through instructor support for the investigative process, retention levels remained high. In the long-distance clinical group, however, retention rate dropped to 37% of the pretest participants. The low retention rate remained even when a paper-administration of the tool was performed by the theory instructor in class. In the Spring 2007 phase of data collection, all administration was performed via a paper tool and also was completed locally. The retention rate for participants was 100%.

The third main challenge of data collection was accessing the identified preceptors for self-evaluation of their preparation to work with students. Paper-based evaluations were administered to identified preceptors by a clinical instructor. Even after follow up by the clinical instructor 2 weeks after the evaluations originally were distributed, no evaluations were returned to the researcher. Ultimately, three individual preceptors were contacted, and one agreed to meet to discuss her experiences working with students. According to the preceptor, the main barrier to survey completion was lack of time on the job as all nurses are very busy providing patient care and working with students.

Finally, long-distance data collection presented one of the largest challenges. Initially, the researcher planned to use an online survey administration in order to facilitate data collection. As previously mentioned, it was decided that the best way

to access all of the clinical students who were beginning their nursing clinical rotations was to have the theory instructor for that level of student post an invitation and a link to the study on her online class portal. The instructor also provided support for the investigative process by encouraging her students to complete the survey when she saw them in the classroom environment. In light of the low response rate, a paper-based tool administration might have increased student participation in the pretest data collection. Due to travel and time restrictions, however, the online administration method was maintained for the pretest, and, when the posttest online administration also proved to have a low response rate, a paper-based survey was administered. Not being able to meet directly with the students to garner interest and follow through in the study had a negative impact on data collection from the students in Southeast region nursing program.

Regardless of the challenges of study implementation and the lack of statistically significant findings, there is real promise for widespread inclusion of residency-based clinical education in existing nursing programs. Nursing education is at a crossroads and pedagogical methods that have been in place since the move from residency-based to theory-based nursing education in the 1960s are no longer working well. This is evident in deteriorating levels of student competency upon graduation. Many factors contribute to the decreasing ability of clinical nursing education to prepare adequately new graduate nurses, with the increasing complexity of the healthcare system and rising patient acuity among the top reasons. New graduates not only must be able to care for highly compromised patients, they must also be able to navigate the complex web of interdependencies necessary for

successful multidisciplinary healthcare. By being able to work consistently with one nurse, a nursing student is able to participate in the key nursing role of integrating patient and unit-specific information and engaging in complex decision making. Through lasting, consistent participation in the nursing role, students are better able to develop high levels of clinical decision-making competencies for themselves. Research investigating the most effective methods of promoting nursing student development of clinical decision making and of linking best practices in clinical education with patient safety outcomes is necessary for the continued growth of a valued nursing profession.

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# Appendixes

# Appendix A

## Satisfaction with Clinical Instructor and Satisfaction with Preceptor Tool (Preceptor Version)

## Satisfaction with Preceptor

Please circle the level of agreement that most closely resembles your experiences in this clinical course.

| | Strongly Agree | | | | Strongly Disagree |
|---|---|---|---|---|---|
| 1. My preceptor explains clinical techniques clearly. | 5 | 4 | 3 | 2 | 1 |
| 2. My preceptor demonstrates concern for my learning. | 5 | 4 | 3 | 2 | 1 |
| 3. My preceptor helps provide a positive learning environment. | 5 | 4 | 3 | 2 | 1 |
| 4. My preceptor contributes to my understanding of the whole patient. | 5 | 4 | 3 | 2 | 1 |
| 5. My preceptor is a good nursing role model. | 5 | 4 | 3 | 2 | 1 |
| 6. My preceptor supports and encourages my learning. | 5 | 4 | 3 | 2 | 1 |
| 7. Working with my preceptor allows me to meet the course objectives. | 5 | 4 | 3 | 2 | 1 |
| 8. The clinical experiences meet my learning needs for this course. | 5 | 4 | 3 | 2 | 1 |
| 9. Working with my preceptor gives me greater confidence in working in the clinical setting. | 5 | 4 | 3 | 2 | 1 |
| 10. Overall, I rate my preceptor as a good clinical teacher. | 5 | 4 | 3 | 2 | 1 |

## Satisfaction with Preceptor

**Please tell us about yourself:**

❒ Male ❒ Female

**Age:** ❒ 18-years-old or less ❒ 19-25-years-old ❒ 26-30-years-old

❒ 31-40-years-old ❒ 41-years-old or more

**Amount of clinical experience outside of nursing school:**

❒ Less than 6 months ❒ 6 months – 1 year ❒ 2 - 3 years

❒ 4 - 5 years ❒ More than 5 years

Comments:

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# Appendix B

## Satisfaction with Clinical Instructor and Satisfaction with Preceptor Tool (Clinical Instructor Version)

# Satisfaction with Clinical Instructor

Please circle the level of agreement that most closely resembles your experiences in this clinical course.

| | Strongly Agree | | | | Strongly Disagree |
|---|---|---|---|---|---|
| 1. My instructor explains clinical techniques clearly. | 5 | 4 | 3 | 2 | 1 |
| 2. My instructor demonstrates concern for my learning. | 5 | 4 | 3 | 2 | 1 |
| 3. My instructor helps provide a positive learning environment. | 5 | 4 | 3 | 2 | 1 |
| 4. My instructor contributes to my understanding of the whole patient. | 5 | 4 | 3 | 2 | 1 |
| 5. My instructor is a good nursing role model. | 5 | 4 | 3 | 2 | 1 |
| 6. My instructor supports and encourages my learning. | 5 | 4 | 3 | 2 | 1 |
| 7. Working with my instructor allows me to meet the course objectives. | 5 | 4 | 3 | 2 | 1 |
| 8. The clinical experiences meet my learning needs for this course. | 5 | 4 | 3 | 2 | 1 |
| 9. Working with my instructor gives me greater confidence in working in the clinical setting. | 5 | 4 | 3 | 2 | 1 |
| 10. Overall, I rate my instructor as a good clinical teacher. | 5 | 4 | 3 | 2 | 1 |

## Satisfaction with Clinical Instructor

**Please tell us about yourself:**

❒ Male ❒ Female

**Age:** ❒ 18-years-old or less ❒ 19 - 25-years-old ❒ 26-30-years-old

❒ 31 - 40-years-old ❒ 41-years-old or more

**Amount of clinical experience outside of nursing school:**

❒ Less than 6 months ❒ 6 months – 1 year ❒ 2 - 3 years

❒ 4 - 5 years ❒ More than 5 years

Comments:

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# Appendix C

## Consent Form for Clinical Instructors

Dear Professor _____:

This letter confirms that you have been provided with a brief description of my dissertation research concerning nursing students' perceptions of clinical decision making within the clinical education setting. Your signature below indicates that you agree to allow me access to students enrolled in two of your clinical groups whom I may contact for participation in this pilot study. The nursing students will receive from me a cover letter, informed consent form, and the Clinical Decision Making in Nursing Scale. Nursing students who agree to participate will complete the Scale and return it to me upon completion.

I will make every effort to ensure that my data collection causes minimal inconveniences to the your time in the clinical setting and to the nursing students. Your participation and the participation of your nursing students will be entirely voluntary and results will be kept confidential and anonymous.

After my research project has been competed in May 2008, I will be glad to send you a summary of my research findings and conclusions. Please feel free to contact me if you have any further questions about this project.

Sincerely,

Signature_____ Date_____

# Appendix D

## Consent Form for Nursing Program Dean

Dear Dean_____:

This letter confirms that you have been provided with a brief description of my dissertation research concerning nursing students' perceptions of clinical decision making within the clinical education setting. Your signature below indicates that you agree to identify clinical instructors and pool of nursing students whom I may contact for participation in this pilot study. The nursing students will receive from me a cover letter, informed consent form, and the Clinical Decision Making in Nursing Scale. Nursing students who agree to participate will complete the Scale and return it to me upon completion.

I will make every effort to ensure that my data collection causes minimal inconveniences to the clinical instructor and nursing students. The participation of the clinical instructor and nursing students will be entirely voluntary and results will be kept confidential and anonymous.

After my research project has been completed in May 2008, I will be glad to send you a summary of my research findings and conclusions. Please feel free to contact me if you have any further questions about this project.

Sincerely,

Signature_____ Date_____

# Appendix E

## Cover Letter to Students for Pretest

Cover Letter to Students for Pretest

Dear Nursing Students:

I am conducting a study on nursing students' perception of the clinical education setting. This is toward completion of my doctoral studies in the at the . I am asking for your participation in this study because of your involvement in the clinical nursing education experience. Your participation in this study will help nursing teachers and clinical instructors understand educational factors in clinical courses.

The study involves voluntary participation in completion of the Clinical Decision Making in Nursing Scale. Your decision to participate or not participate will in no way affect your status in the School of Nursing or the grade in this course. It will take approximately 20 minutes to complete the questionnaire.

Participation in this study is voluntary. If you choose to participate, please fill out the questionnaire and supply the first three letters of your mother's maiden name and the last four digits of your social security number on the questionnaire. When you have completed the scale please return it to the envelope I have provided. Return of the scale to the envelope signifies that you consent to participation in this pilot study. If you choose not to participate, you have a reading about clinical education that you may read. If you have additional questions about the study, you may call me at or e-mail me at . Approval for this study has been obtained from the . Thank you for your interest in and contribution to my research on the clinical-education environment.

Sincerely,

# Appendix F

## Cover Letter to Students for Posttest

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Dear Nursing Students:

I am conducting a study on nursing students' perception of the clinical education setting. This is toward completion of my doctoral studies in the at the I am asking for your participation in this study because of your involvement in the clinical nursing education experience. Your participation in this study will help nursing teachers and clinical instructors understand educational factors in clinical courses.

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