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The Relationship Between Critical Thinking Skills and Perceived Self-Efficacy in Associate Degree Nursing Students

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By

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Abstract

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The purpose of this descriptive, correlational study was to determine if a relationship exists between critical thinking skills and self-efficacy in Associate Degree nursing students. A convenience sample of 30 nursing students in their second year of an Associate Degree RN program was used. The framework for this study utilized Bandura's social cognitive theory and Benner's nursing theory of skill acquisition and development. Critical thinking skills were measured by the California Critical Thinking Skills Test . Self-efficacy was measured by the Generalized Perceived Self-Efficacy Scale. Demographic data of age, gender, marital status, number of dependents, employment status, and income were obtained to determine if there were any relationships or differences related to critical thinking or self-efficacy. A positive correlation was found between critical thinking skills and perceived self-efficacy ($r = .40$, $p = .03$). A replication of this study with a larger sample would be recommended. A longitudinal study might indicate changes that occur as the student progresses in the learning process with regard to critical thinking skills and self-efficacy.

DEDICATION

This study is dedicated to my husband, George and to my children, Melissa and Brent, for their constant love and support, and their cooperation in helping me keep a focus on priorities and a perspective on life throughout this project and my graduate education.

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CHAPTER 1

INTRODUCTION

A required expectation and behavior of a professional nurse is the ability to make effective decisions based upon the intellectual skill of reasoning. Competence in reasoning enhances the analytical skills of the nursing student in thinking through the complex situations and problems encountered in nursing. This competence in reasoning is called "critical thinking" (Facione & Facione, 1996). Assessing the nursing student's ability to use critical thinking skills in application to the nursing process is an essential function and responsibility of nurse educators.

In the past, the problem-solving method has been viewed as the key to finding effective solutions. More recently, the nursing profession has begun to realize the limitations of the problem-solving method (Bandman & Bandman, 1995; Jones & Brown, 1993). This method starts with a problem and ends with a solution. In contrast, critical thinking is more open-ended, focusing on continuous improvement, whether or not problems exist. Brigham (1993) relates critical thinking skills and the nursing process as follows:

> Nurses must be disciplined, self-directed thinkers if they effectively apply the nursing process. They must possess knowledge that allows them to conduct inquiries into the client's health status to discover information from which to make valid inferences. These inferences are developed into a hypothesis that accurately describes the client's health problem. They must explore the situation thoroughly, integrate

all available client information, and draw upon an extensive biopsychosocial scientific knowledge base to intelligently plan and implement care to resolve their clients' problems and assist them to an optimal level of health. (p. 49)

Problem Statement

Critical thinking skills have become an important indicator of a successful educational process. Critical thinking skills facilitate the use of the nursing process. Developing the skills to think thoroughly, imaginatively, and competently will empower the nursing student to care for clients and serve as a patient advocate; additionally, these skills can assist the student in making life choices. The academic community has a commitment to health-care consumers to provide professional nurses who are effective decision-makers regarding patient-care issues. Further, health-care consumers have a right to expect that all nurses graduated from an accredited nursing program are competent critical thinkers.

Nursing is in a state of change, defining its theory, its practice, and validating its knowledge base and practice with research. Critical thinking allows nurses to be active participants in their own intellectual and professional growth (Miller & Babcock, 1996). Critical thinking is the key to successfully engaging problematic situations. Nurses who do not think critically become part of the problematic situation. Nurses must make complex decisions, adapt to new situations, and continuously update their knowledge and skills. Nurses must possess a high level of critical thinking skills if they are to practice competently in the health-care environments of today (Brigham, 1993).

Critical thinking is a multidimensional metacognitive activity. Effective use of critical thinking skills depends on a person who is open minded, considers alternative points of view, respects the right of others to challenge ideas, is productive, and engages in an orderly decision-making process (Facione, 1991; Kintgen-Andrews, 1991). These attributes tend to indicate that a high level of perceived self-efficacy is important in attaining success with critical thinking skills. Perceived self-efficacy refers to one's beliefs concerning what one is capable of doing (Bandura, 1986).

It has been casually observed by nursing educators that nursing students who demonstrate a high level of self-efficacy perform better in the clinical practice area. One of the key principles cited by Brookfield (1987) that will help students think critically is the affirmation of the critical thinkers' self-worth. Bandura's (1986) writings on self-efficacy lead to the conclusion that individuals with high perceived self-efficacy try more, accomplish more, and persist longer at a task than individuals with low perceived self-efficacy.

Purpose

The purpose of this descriptive, correlational study was to determine if there is a relationship between critical thinking skills and perceived self-efficacy in Associate Degree (AD) nursing students, as assessed by the California Critical Thinking Skills Test (CCTST) and the Generalized Perceived Self-Efficacy Scale (GPSS). Additional variables addressed are demographic data concerning the study participants. The specific areas of information are age, gender, marital status, number of dependents in the home, employment status while in school, and annual

household income.

CHAPTER 2

REVIEW OF LITERATURE AND CONCEPTUAL FRAMEWORK

Review of Literature

The literature review for this study is focused on the concepts of critical thinking and self-efficacy. Several studies were identified which addressed measurement of critical thinking skills in student nurses. A lesser number of studies were identified which related the concept of self-efficacy to academic achievement in nursing students. One study was identified which related the concept of self-concept and critical thinking in staff nurses.

Self-efficacy. The relationship between self-efficacy and academic achievement in Associate Degree Nursing (AD) students was explored by Defelice (1989). Academic achievement was measured by the first year nursing grades and the score on the math section of the Scholastic Aptitude Test. Self-efficacy was measured by a Self-efficacy Survey Instrument developed by Defelice. The self-efficacy score was then correlated with the measures of academic achievement to determine if self-efficacy was a predictor of academic achievement in AD programs. The findings did not support self-efficacy as a significant predictor.

Chacko and Huba (1991) tested numerous relationships in a causal learning model of academic achievement developed by them. The subjects of this study were 134 first-year nursing students enrolled at a Midwestern community college. The model developed focuses on student contributions to academic success and depicts the possible influences of cognitive variables, affective variables, and

learning strategy on academic achievement. The cognitive and affective aspects are viewed as being directly related to a student's feeling of self-efficacy. Taken further, the self-efficacy is directly related to academic achievement. Of all the variable relationships tested, only self-efficacy was found to have a direct effect on academic achievement ($p<001$). A high level of self-efficacy led to improved academic achievement.

Wahtera (1991) conducted a cross-sectional study differentiating nursing process performance by education, experience, domain-specific knowledge, strategic knowledge, and self-efficacy. The sample of 72 nursing students was from a licensed practical nurse completion and a basic nursing program in a mid-west, metropolitan, private, liberal arts Catholic college. The basis of the theoretical framework was the developing body of cognitive psychology research on problem solving. Among the findings, it was found that self-efficacy and nursing process performance were positively correlated. Of further interest, it was found that self-efficacy was the only variable that had a significant effect on nursing process performance.

The relationship between critical thinking and self-concept in staff nurses was studied by Beeken (1997). She also explored the influence of critical thinking and self-concept on nursing practice. The quantitative data were collected using the California Critical Thinking Skills Test (CCTST) and the Tennessee Self-Concept Scale (TSCS). Data were collected from 100 staff nurses of a major metropolitan hospital in the western United States. The educational background of the sample was approximately evenly distributed between diploma program graduates, AD

programs, and BSN programs. The data from this study do not support a statistically significant relationship between critical thinking and self-concept (p=>0.05).

Critical thinking. Miller (1992) investigated the effect of critical thinking on students in a degree-completion baccalaureate nursing program at a large, urban-oriented, state-supported institution of higher education located in a Rocky Mountain state in the United States. The sample of student nurses (n=137) was comprised of those entering the program in the autumn semester, 1980, through the spring semester, 1983, and who completed the program by May, 1987. Miller found a significant difference (p=0.05) in the students' exit scores when compared to their entry scores on the Watson-Glaser Critical Thinking Appraisal (WGCTA). The results supported Miller's expectation that completion of the program would have a positive impact on the overall critical thinking skills of the students.

Bauwens and Gerhard (1987) completed a longitudinal descriptive-correlational study to ascertain the relationship between WGCTA scores and success in passing the National Licensure Examination for Registered Nurses (NCLEX). The convenience sample (n=177) was comprised of students who had graduated from a baccalaureate nursing program in southern Arizona. Student participation was voluntary and data were collected through five academic terms. The WGTCA scores were measured at admission to and graduation from the nursing program. A significant positive relationship was found between both the entry and exit WGCTA scores and the performance on the NCLEX.

The relationship of critical thinking ability to professional nursing competence

in nursing graduates was investigated by Maynard (1996). The defining characteristics of professional nursing competence were defined by Patricia Benner's model of stages of skill acquisition (Benner, 1984). The measurement of critical thinking ability was obtained by administration of the WGCTA at periodic times from beginning nursing student to practicing nurse. The investigator first selected a random, cross-sectional sample of graduates (n=170) from a baccalaureate nursing program in a private liberal arts college from 1985 to 1990. From this randomly selected population, Maynard chose a random sample of 30 from two cohorts of responding graduates (n=43). This same randomly selected population participated in measurements of critical thinking ability as sophomore and senior students. Critical thinking ability did not significantly change during the educational program, however, a significant increase, at the 0.05 level, in the WGCTA scores was noted when the students became practicing nurses.

Vaughn-Wrobel, O'Sullivan, and Smith (1997) evaluated critical thinking skills of students in a baccalaureate nursing program. The study was conducted at an academic health sciences center in a large southern metropolitan city using a convenience of 391 students. The WGCTA was used to measure critical thinking in four consecutive nursing classes from 1993 through 1996. Scores were obtained at program entry, at the end of junior year, and at the end of senior year. The investigators found no significant gain (p=0.44) in the mean WGCTA scores over the 2.5 years of the nursing curriculum. As one possible explanation for this finding, the investigators propose that the WGCTA may not be the best measure of critical thinking ability for nursing students.

Nursing faculty serve as intervening agents in the development of critical thinking in nursing students. The critical thinking skills of undergraduate nursing faculty were examined by Coon (1997). One of the purposes of the study was to examine the faculty's critical thinking skills in order to determine how these skills compared with the established critical thinking skill norms for undergraduate nursing students. The study further examined if the critical thinking skills of nursing faculty were related to the type of program they teach in, their preferred methods of instruction, and their level of formal training in critical thinking. Undergraduate nursing faculty (n=120) participated in the study, 50 faculty from BSN programs, and 70 faculty from AD programs. The CCTST was used to measure critical thinking skills. In comparing the faculty scores to the national norms for nursing students, it was demonstrated that nursing faculty scored consistently higher than nursing students in all areas ($p<0.05$).

Conceptual Framework

The conceptual framework for this study includes the concepts of critical thinking and self-efficacy. Critical thinking is a fundamental process in nursing practice. Critical thinking ultimately leads to clinical judgments that will determine nursing interventions. Critical thinking is a complex, interactive process which can be impacted by interpretations the individual makes of the world. One of these interpretations is how confident a person is in their ability to perform a specific task to successful completion. This perceived confidence is called self-efficacy.

Self-Efficacy. Social cognitive theory emphasizes the fact that most of the information we gain comes from our interactions with other people (Hergenhahn

& Olson, 1997). Further, social cognitive theory recognizes the importance of actual success and failure in influencing later performance. As this theory has evolved over the years, the construct of self-efficacy has gained increasing prominence and is viewed as a pivotal mechanism influencing behavior (Bandura, 1986). According to social cognitive theory, self-efficacy refers to an individual's judgments of their own capabilities to execute a given level of performance. In other words, self-efficacy corresponds to how confident a person is in their ability to perform a specific task to successful completion (Bandura, 1986).

In support of the proposition that self-efficacy plays a pivotal mediating role between knowledge and behavior, Murdock and Neafsey (1995) state the following:

> Perceptions of self-efficacy are derived from an individual's own successes or failures in performance, observations of the successes and failures of others, verbal persuasion from self or others, and cues from one's own physiological responses of comfort or discomfort in anticipating or actually performing a task. Further, once derived, these perceptions of efficacy influence what individuals choose to do, how much effort they invest, how long they persevere in the face of disappointing results, and whether tasks are approached anxiously or self-assuredly. (p. 159).

According to Bandura (1986), self-efficacy makes a difference in how people feel, think, and act. Individuals with a low sense of self-efficacy may experience depression, anxiety, or feelings of helplessness. Further, these individuals may have low self-esteem and may entertain doubtful views regarding their accomplishments and personal development. In regard to thinking, individuals with

a high sense of self-efficacy have a strong sense of competence which facilitates cognitive processes in a variety of situations, including decision-making. Regarding preparation to act, motivation is fueled by an individual's perceptions; motivation can be strengthened or hindered by an individual's self-efficacy level.

The German psychologist and researcher, Ralf Schwarzer (1992), has studied self-efficacy and has conceptualized what he calls a generalized sense of self-efficacy. This concept is defined by Schwarzer as a "global confidence in one's coping ability across a wide range of demanding or novel situations" (Schwarzer, 1993, p. 162). Generalized perceived self-efficacy refers to optimistic beliefs regarding one's ability to cope with a large variety of stressors.

Self-efficacy judgments can predict future behavior with an amazing degree of precision, frequently better than past behavior (Bandura, 1977; Lee, 1983; Meier, et al., 1984; Harvey & McMurray, 1994). These self-efficacy beliefs have been found to influence the way in which individuals perceive situations, and to be predictive of academic performance and persistence in science/engineering students (Brown, et al., 1989).

Critical thinking. Nursing theorist, Patricia Benner (1984), has studied clinical nursing practice in order to uncover and delineate the knowledge embedded in nursing practice and to describe the difference between practical knowledge and theoretical knowledge. She states the belief that clinical practice is an arena of inquiry and knowledge development. In their analysis of Benner's work, Alexander and Keller (1994) state "clinical practice is an arena of inquiry and knowledge development. Clinical practice embodies the notion of excellence; by studying it we

can uncover new knowledge." (p. 164). The depth and breadth of expert knowledge, largely gained from opportunities to apply theory in real situations, greatly enhance critical thinking ability.

The component of Benner's (1984) theory that provides the conceptual framework for the phenomenon of critical thinking is the model Benner developed which describes five levels of skill acquisition and development: novice, advanced beginner, competent, proficient, and expert. Benner based this model on Dreyfus and Dreyfus' (1980) model of skill acquisition.

Individuals in the *novice* stage of skill development have no background experience of the situation in which they are involved. At this level, knowledge is organized as separate facts and the individual must rely heavily on resources. Usually this level applies to nursing students, but Benner proposed that nurses at higher skill levels of practice in one area could be classified at the novice level if placed in an unfamiliar clinical area, such as a medical-surgical nurse being reassigned to the family birthing area for a shift (Benner, 1984).

The *advanced beginner* stage reflects the level of most newly graduated nurses. The functioning of nurses at this level is rule-guided and tends to focus more on procedures than the patient response to the procedure. At this level, the nurse has limited knowledge of suspected problems and therefore, tends to assess and collect data on a more superficial basis (Benner, 1984).

The *competent* level is exemplified by more conscious and deliberate planning, allowing the nurse to determine which aspects of the clinical-problem are important and which can be ignored. An increased degree of proficiency is

demonstrated, but the nurse's focus tends to be on issues of time-management and task-organization, rather than on coordination of time and effort in relation to the patient's needs (Benner, 1984). At the *proficient* stage, the nurse is moving forward in thought development and is able to perceive the total picture of a clinical-problem and the nurse's performance is guided by care standards, not dictated by them. Increased confidence in the nurse's own knowledge base and abilities, based upon past experiences, is evident and is reflected in the response to patients and their clinical-problems. Usually it is at this point that the nurse's "sense of humor" starts to return regarding organizational problems that impact the patient's daily care. This level is a tremendous leap from the competent level and provides the bridge to move on the next level (Benner, 1984).

The fifth and last stage is labeled as *expert*. Now the nurse has a highly organized and structured knowledge base, enriched with a storehouse of experiential knowledge. At this level the nurse is more self-confident, less anxious, and therefore more focused; the nurse will assess and think things through before acting. The nurse is able to focus on both the parts (i.e., procedures) and the whole (i.e., patient response) and is comfortable with rethinking procedure if the patient's need requires modification of the procedure. Most importantly, the expert nurse is challenged by the questions of the novice nurse, using the interchange to clarify and validate her/his own thinking (Benner, 1984).

In defining *person*, Benner (1984) embraces Heidegger's (1962) phenomenological description of a person as a self-interpreting being who is defined by concerns, practices, and life experiences. Persons are always engaged

meaningfully in the context of their immediate situation. Persons come to situations with an understanding of the self in the world (Benner & Wrubel, 1989). Further, Benner asserts the person is embodied and defines embodiment as the capacity of the body to respond to meaningful situations. Benner and Wrubel (1989) have envisioned the major aspects of understanding the person must deal with as the role of the situation, the role of the body, the role of personal concerns, and the role of temporality, or impermanence. Together these aspects of the person make up the person in the world. Benner's (1984) stages of skill acquisition and development reflect a progressive increase in one's knowledge base due to experiential knowledge. Also, as an individual nurse progresses, the nurse's confidence in making judgments and evaluations increases related to a greater familiarity with the thinking process involved in making judgments and evaluations. The particular thinking process needed to formulate well-founded judgments and evaluations is called critical thinking.

Critical thinking is an interactive process that occurs between the individual and the interpretations the individual makes of the world. It demands a skillful application of knowledge and experience in making discriminating judgments and evaluations. Critical thinking is substantially greater than the sum of its parts. Critical thinking involves expanding one's thinking processes to include an awareness of the context of the situation (Jones & Brown, 1991).

Critical thinking is a complex and circuitous process. As such, there exists no one, standard definition of critical thinking. The American Philosophical Association, through its Committee on Pre-College Philosophy, launched a 2-year endeavor to

reach a consensus definition for critical thinking. The working group included experts from many disciplines, and their work came to be known as the Delphi Report (American Philosophical Association, 1990). The Delphi group arrived at the following definition: "critical thinking is the process of purposeful, self-regulatory judgment. This process gives reasoned consideration to evidence, contexts, conceptualizations, methods, and criteria" (American Philosophical Association, 1990. p. 3). Brookfield (1987) envisioned four components of critical thinking: (1) identifying and challenging assumptions, (2) challenging the importance of context, (3) imagining and exploring alternatives, and (4) allowing reflective skepticism.

Summary and Implications for the study

The research literature reveals no consensus of opinion on the relationship of critical thinking and the process of nursing education. The results reported were all documented in BSN nursing students.

The research literature reveals the study of self-efficacy and its effect on academic achievement. Results reported were all documented in AD nursing students. A study of LPN students reveals a positive relationship to self-efficacy and nursing process performance. Only one study examined the relationship of critical thinking and self-concept. The population studied was staff nurses of varied educational preparation. The reported results do not report a significant relationship between critical thinking and self-concept.

Critical thinking is a key component in any nurse's process of formulating clinical judgments and evaluations. It is, therefore, vital to understand that process and the factors which can impact that process. Self-efficacy can have a profound

influence on the individual's ability to process knowledge and can also be a predictor of future behavior.

Visual representation of the conceptual framework. The conceptual framework for this study includes the concepts of critical thinking and self-efficacy and their relationship to the person, specifically the Associate Degree nursing student. Refer to Figure 1 for a pictorial diagram of the conceptual framework.

The person, as defined by Benner (1984), is represented by a circle. Within the person are the defining characteristics of concerns, practices, and life experiences, represented by three different circles. The concept of self-efficacy (SE), as defined by Bandura, is an aspect of the person, encompassing some of each of the defining characteristics. Self-efficacy is represented by the area of overlap of the three inner circles.

The elements of knowledge, situational context, and experience influence both the person, as a whole, and the process of critical thinking, as represented by the dashed lines. The person uses critical thinking to formulate judgments and evaluations, as indicated by the solid line. Once formulated, these judgments and evaluations contribute to a person's life experiences and experience, in general, as indicated by the dashed lines.

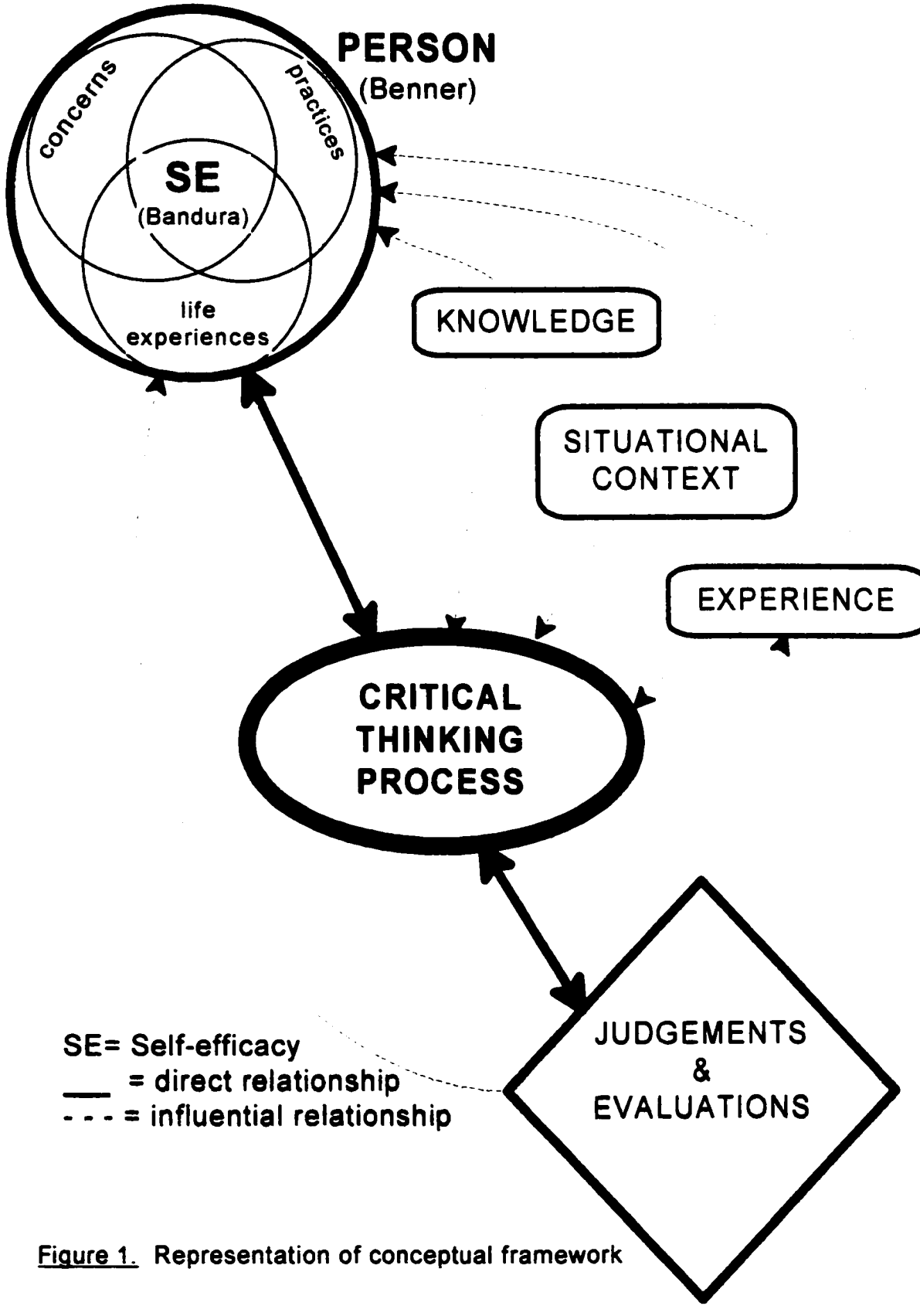

Figure 1. Representation of conceptual framework

Research Questions

The following research questions are asked:

1. What is the relationship between the students' critical thinking ability and perceived self-efficacy?

2. What is the relationship between critical thinking ability and the demographic variables of age and number of dependents in the home?

3. What is the difference between critical thinking ability and the variables of household income, gender, marital status, and employment status?

4. What is the relationship between perceived self-efficacy and the demographic variables of age and number of dependents in the home?

5. What is the difference between perceived self-efficacy and the demographic variables of household income, gender, marital status, and employment status?

Definition of Terms

Critical thinking ability was defined as the total score on the CCTST (Appendix A).

Perceived self-efficacy was defined as the total score on the GPSS (Appendix B).

CHAPTER 3

METHODOLOGY

Design

This study utilized a descriptive-correlational design to determine if there is a relationship between critical thinking skills and perceived self-efficacy in AD nursing students, as assessed by the California Critical Thinking Skills Test (CCTST) and the Generalized Perceived Self-efficacy Scale (GPSS). Select demographic data were also collected to determine if any of these variables have a relationship to either critical thinking ability or perceived self-efficacy. The demographic variables explored were age, gender, marital status, number of dependents in the home, employment status while in school, and annual household income.

Sample

The subjects are nursing students in their last academic year of an associate degree RN program. The source site for subjects was a western Michigan community college.

All nursing students in their last academic year were approached for participation in the study. Participation was voluntary and consent from the subject was obtained. The sample is a convenience sample.

Instruments

Three instruments of measure were used in this study, the California Critical Thinking Skills Test (CCTST), the Generalized Perceived Self-Efficacy Scale (GPSS), and a researcher-designed demographic data questionnaire. These instruments are described below.

The CCTST (Appendix A) was utilized to measure the variable of critical thinking skill. The CCTST is a standardized, 34-item, multiple choice test which targets those core critical thinking skills regarded to be essential elements in a college education. Each item is given in standard English, using no technical vocabulary or critical thinking language. The items are set in contexts and address topics which are familiar to college-aged persons and other adults. General background knowledge readily achievable through normal maturation and elementary and secondary schooling is presumed. No discipline-specific college level content knowledge is presumed.

The CCTST reports an overall score concerning critical thinking cognitive skills and three subscores: analysis, evaluation, and inference (Facione, 1994). Facione and Facione (1994) describe analysis as the ability to "identify the intended and actual inferential relationships among statements, questions, concepts, descriptions, or other forms of representation intended to express beliefs, judgments, experiences, reasons, information or opinion" (p. 5). The cognitive skill of evaluation as defined by Facione and Facione (1994) means:

> to assess the credibility of statements or other representations which are accounts or descriptions of a person's perception, experience, situation, judgment, belief or opinion; and to assess the logical strength of the actual or intended inferential relationships among statements, descriptions, questions, or other forms of respresentations. (p. 5)

Lastly, the cognitive skill of inference as defined by Facione & Facione (1994) is:

to identify and secure elements needed to draw reasonable conclusions; to form conjectures and hypotheses, to consider relevant information and to educe the consequences flowing from data, statements, principles, evidence, judgments, beliefs, opinions, concepts, descriptions, questions, or other forms of representation. (p. 5)

The CCTST was developed at California State University, Fullerton, and was published in 1990 by the California Academic Press. Development of the CCTST spanned more than two decades of conceptual and experimental research. The quantitative validation study, part of the American Philosophical Association Delphi project definition of critical thinking, was conducted in the 1989-1990 academic year at California State University, Fullerton, using a sample of 1169 college students (Facione, 1991). The results reported by Facione (1991) affirm construct, content, and concurrent validity. The reported reliability coefficient (Kuder Richardson-20) of the CCTST, Form A is 0.70 and for CCTST, Form B is 0.71 (Facione, 1991).

The use of the CCTST(Form A) in this study yielded a reliability coefficient (Kuder Richardson-20) of 0.57. According to Polit and Hungler (1995) a reliability coefficient of 0.70 or higher is sufficient to make group comparisons. The low reliability coefficient yielded for this tool in this study may be related to the small sample size of 30.

The CCTST has not been cited extensively in the literature in view of its very recent development. The CCTST can be hand or machine scored and requires about 45 minutes to complete. The results of the CCTST include a composite score

and subscores in the areas of analysis, evaluation, and inference. Reference norms are provided (Facione & Facione, 1994). In an analysis of all the major critical thinking tests, Rane-Szostak and Robertson (1996) identifed three strengths of the CCTST. These included the perception that the CCTST is the most sophisticated of the critical thinking test forms available, the fact that alternate forms (A and B) are available for pre-post testing, and the fact that it is derived from a current theory base.

There are very few critical thinking instruments in general. Those that exist are based on somewhat dissimilar theoretical constructs. As stated previously, the CCTST is the only critical thinking skills test based on the Delphi expert consensus conceptualization of critical thinking. The Watson Glaser Critical Thinking Appraisal (WGCTA) and the Cornell Critical Thinking Tests (CCTT) use older much less powerful concepts of critical thinking (Rane-Szostak & Robertson, 1996).

The GPSS (Schwarzer & Jerusalem, 1993; Appendix B) was utilized to measure the variable of perceived self-efficacy. Perceived self-efficacy specifically addresses an individual's capability to deal with challenging situations. The GPSS is a ten-item psychometric scale that is designed to assess optimistic self-beliefs to cope with a variety of difficult demands in life. The response format utilizes a scale of 1 to 4, with 1=not at all true, 2=hardly true, 3=moderately true, and 4=exactly true.

The GPSS was originally developed by Jerusalem and Schwarzer in 1981 (Schwarzer, 1992). The original version of the scale was in German, consisted of 20 items was later reduced to 10 items. The English language version of the GPSS was developed in 1993. At the present time the scale is available in 21 languages

(Schwarzer & Jerusalem, 1993). Schwarzer conducted research to measure the reliability and consistency of the GPSS in 14 cultures, using 13 language adaptations of the instrument (Schwarzer, 1993). The results of the research yielded internal consistencies, using Cronbach's alpha, of between 0.78 and 0.91(Schwarzer, 1993). According to Schwarzer (1993) "internal consistencies, item-total correlations, and factor loadings indicated that the General Self-Efficacy Scale can be seen as homogeneous and unidimensional" (p. 11).

The use of the GPSS in this study yielded a reliability coefficient (Cronback's Alpha) of 0.85. Since the reliability coefficient is >0.70, group comparisons many be made according to Polit and Hungler (1995).

The researcher-developed questionnaire (Appendix C) provided information to describe the sample, and information concerning the selected demographic variables under consideration in this study. These variables included age, gender, marital status, number of dependents in the home, employment status while in school, and annual household income. These variables were examined to identify relationships to either critical thinking ability or perceived self-efficacy. Past experiences could relate to critical thinking ablility or perceived self-efficacy. As one becomes older, there have been a greater number and variety of life experiences where decision making was necessary. More complex decision making could be associated with marital status, employment responsibilities, and responsibility for care of others. A characteristic process of thinking and self-efficacy could also be associated with gender.

Procedure

Following approval from the Human Research Review Committee at Grand Valley State University, the appropriate nursing program director and the research review committee of the institutions, subjects were identified from lists provided by the nursing program. To recruit subjects, this researcher approached each nursing class two weeks prior to the administration of the tools in this study to explain the intent of the study and their potential involvement. Appendix D contains the verbal script used. Any additional clarification was provided to the group of potential subjects by this researcher via response to questions.

Data were collected at the academic site campus, where the subjects routinely gathered. The tools were administered in one sitting in a group format to avoid discrepancy in instructions and to avoid participants discussing the contents of the tools. All data collection was conducted by this researcher. All data is held in strict confidentiality by assignment of an ID number to each subject.

Consent was obtained from the subjects by completion of the demographic questionnaire which contained a statement of consent (Appendix C). Data were analyzed using the SPSS computer program.

Subjects were informed that they could withdraw from participation in the study at any time without penalty. Subjects were also informed that confidentiality would be maintained through the use of coded data and that only group data results would be reported, in order to protect the individual respondents. (Verbal script-Appendix D)

To measure perceived self-efficacy, each subject received a GPSS, which

contains both the statements and areas for the subject's response to the statements. To measure critical thinking skill, each subject received a CCTST test booklet and a CCTST response form. This researcher administered the CCTST as described in the administration section of the CCTST manual (Facione & Facione, 1994; p. 6-7).

After instructions were given, the subjects were allotted 60 minutes to complete the tools-5 minutes for the demographic questionnaire, 10 minutes for the GPSS, and 45 minutes for the CCTST.

CHAPTER 4

DATA ANALYSIS/RESULTS

Techniques

The scores for the critical thinking ability and perceived self-efficacy were interval data. All of the correct responses from the CCTST (California Critical Thinking Skills Test) were totalled for a total critical thinking score for each study participant. For perceived self-efficacy, the subject's responses to each question on the GPSS (Generalized Perceived Self-Efficacy Scale) were totalled and this total was the subject's score. Interval level data were also obtained with the demographic data of age and number of dependents in the home. Ordinal data were obtained with the demographic data of annual household income. Nominal data were obtained with the demographic data of gender, marital status, and employment status while in the nursing program.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) statistical data analysis program. Pearson's *r* was used to determine relationships with the interval data. The remaining relationships were determined using t-tests. A significance level of $p \leq .05$ was established for all data analysis procedures.

Characteristics of Subjects

Thirty subjects volunteered to participate in this study of a potential 30 students approached. All of the subjects were in the last academic year of an associate degree RN program. All the subjects were students at a western

Michigan community college.

Ninety percent of the sample was female, 10% was male. The mean age of the study participants was 29.60 years, with a standard deviation of 8.12 years. The maximum age reported was 59 years, the minimum age reported was 21 years. Of the participants, 66.7% were married.

The majority of the participants (93.3%) reported having dependents in the home. Of those reporting dependents, the actual number reported ranged from 1 to 8 dependents, with a mean of 3.17 dependents and a standard deviation of 2.02 dependents.

The data reporting employment status while in the nursing program revealed 50% were unemployed while in the nursing program. Reported annual household income revealed 46.7% having an income of <$20,000-$39,999 and 53.3% having an income of $40,000->$50,000.

Performance of Subjects on CCTST

The CCTST Form A (Appendix A) was used to measure critical thinking ability. The CCTST is a 34-item, multiple choice tool, with a possible scoring range of 0-34, with a score of 34 reflecting answering all items correctly. The mean total score reported was 15.37 with a standard deviation of 3.91(M = 15.37; SD = 3.91). The highest reported total score was 22 and the lowest was 7. Thirteen of the study participants reported a score of 50% or greater; per the suggested percentile norms for the CCTST overall score (Facione & Facione, 1994) this places 43.3% of the students in the 65th percentile or above. (See Table 1)

Performance of Subjects on GPSS

The GPSS (Appendix B) was used to measure perceived self-efficacy. The GPSS is a 10-item psychometric scale; the response format utilizes a scale of 1 to 4 for each item. The possible scoring range on this instrument ranges from 10-40, with a total score of 40 reflecting a very high degree of perceived self-efficacy. The mean total score reported was 33.23 with a standard deviation of 3.53 (M = 33.23; SD = 3.53). The highest reported score was 39 and the lowest reported score was 27. Twenty-four of the study participants reported a total score of 30 or greater. (See Table 1)

Table 1

CCTST and GPSS Scores (N = 30)

Instrument	Possible Range	Actual Range	M	SD
CCTST	0 - 34	7 - 22	15.37	3.91
GPSS	10 - 40	27 - 39	33.23	3.53

Research Questions

Research question 1: What is the relationship between students' critical thinking ability and perceived self-efficacy? A moderate, statistically significant relationship was found between critical thinking ability and perceived self-efficacy. A Pearson's r correlation coefficient was calculated to determine the relationship ($r = .40$; $p = .03$).

Research question 2: What is the relationship between critical thinking ability and the demographic variables of age and the number of dependents in the home? A Pearson's r correlation coefficient was calculated to determine these relationships.

A weak, statistically non-significant relationship was found between critical thinking ability and age (r = -.18; p = .35). A weak, statistically non-significant relationship was found between critical thinking ability and the number of dependents in the home (r = .16; p = .40).

Research question 3: What is the difference between critical thinking ability and the demographic variables of household income, gender, marital status, and employment status while in the nursing program? The demographic variable of gender was not compared with critical thinking ability due to lack of variability in the sample. A t-test was performed with each remaining demographic variable to determine any possible differences. No statistically significant difference was found between critical thinking ability and annual household income (t = .17; df = 28; p = .87). No statistically significant difference was found between critical thinking ablility and marital status (t = .03; df = 28; p = .97). No statistically signifiant difference was found between critical thinking ability and employment status while in the nursing program (t = .05; df = 28; p = .96). (See Table 2)

Table 2

Critical Thinking Ability and Select Demographic Variables (N = 30)

Variable	M	SD	t	df	p
Household income			0.17	28	0.87
<$20,000-$39,999	15.50	4.18			
$40,000->$50,000	15.25	3.82			
Marital status			0.03	28	0.97
married	15.35	4.21			
not married	15.40	3.50			
Employment status			0.05	28	0.96
employed	15.40	4.08			
not employed	15.33	3.90			

Research question 4: What is the relationship between perceived self-efficacy and the demographic variables of age and number of dependents in the home? A Pearson's r correlation coefficient was calculated to determine these relationships. No statistically significant relationship was found between perceived self-efficacy and age ($r = -.02$; $p = .93$). No statistically significant relationship was found between perceived self-efficacy and the number of dependents in the home ($r = -.03$; $p = .88$).

Research question 5: What is the difference between perceived self-efficacy and the demographic variables of household income, gender, marital status, and employment status while in the nursing program? The demographic variable of gender was not compared with perceived self-efficacy due to lack of variability in the sample. A t-test was done to determine any differences between perceived self-efficacy and the other variables in the research question. No statistically significant difference was found between perceived self-efficacy and annual household income ($t = 1.22$; $df = 28$; $p = .23$). No statistically significant difference was found between perceived self-efficacy and marital status ($t = -.25$; $df = 28$; $p = .80$). No statistically significant difference was found between perceived self-efficacy and employment status while in the nursing program ($t = .67$; $df = 28$; $p = .51$). (See Table 3)

Table 3

Differences in Perceived Self-Efficacy and Select Demographic Variables (N = 30)

Variable	M	SD	t	df	p
Household income			1.22	28	0.23
<$20,000-$39,999	34.07	2.99			
$40,000->$50,000	35.50	3.88			
Marital status			-0.25	28	0.80
married	33.35	3.88			
not married	33.00	2.87			
Employment status			0.67	28	0.51
employed	33.66	3.96			
not employed	32.80	3.12			

Other Findings

Both the CCTST overall scores and the scores on the GPSS produced no standard distribution curve, no identifiable skewness, and each demonstrated a multimodal distribution.

The CCTST can also be scored on three sub-scales of analysis, evaluation, and inference. Each separate item on the CCTST is relegated to one of these three subscales; together they represent the core skills of critical thinking. Facione and Facione (1994) state "metacognitive self-regulation, while being exercised as one takes the CCTST, cannot be readily accessed apart from the operation of the other skills" (p. 5). The following group scores were reported: analysis 50.0%; evaluation 34.8%; and inference 54.5%.

CHAPTER 5

DISCUSSION AND IMPLICATIONS

Discussion

A moderately significant relationship was found between critical thinking ability and perceived self-efficacy. This reported result differs from the findings in the study conducted by Beeken (1997) in which there was no significant relationship found between critical thinking and self-concept. Chacko and Huba (1991) reported in their study that a high level of self-efficacy led to improved academic achievement. The reports of this study would lend support to that statement, if one views critical thinking ability and academic achievement as congruous. In a study conducted by Wahtera (1991) it was found that self-efficacy was the only variable that had a significant effect on nursing process performance. Critical thinking ability is viewed as an integral part of the nursing process. Therefore, the reported results of this study may support the finding of Wahtera (1991) related to self-efficacy.

Benner (1984) identified nursing students as being in the *novice* stage of skill development, with knowledge being organized as separate facts and having no background experience of the situation in which they are involved. Critical thinking is a key component in any nurse's process of formulating clinical judgments and evaluations. The subjects of this study were nursing students and the mean reported score (M = 15.37) was slightly below the reported Norm Sample (M = 15.89) (Facione & Facione, 1994). This result lends support to Benner's description of the *novice* stage.

The variables addressed in the demographic data concerning the study participants did not demonstrate any correlations with critical thinking ability or perceived self-efficacy. These specific data areas were age, gender, marital status, number of dependents in the home, employment status while in the nursing program, and annual household income. Other demographic variables which could be explored are grade point average, values and beliefs, ethic background, and related work experience in nursing.

Limitations

A recognized limitation of this study was the use of convenience sampling. Polit and Hungler (1995) state "convenience sampling entails the use of the most conveniently available people or objects for use as subjects in a study" (p. 232). A problem with this type of sampling is that the available study participants may not be representative of the larger population with relation to the variable(s) being studied.

A second limitation of the study was the sample size (n = 30). Using the largest sample possible is recommended by Polit and Hungler (1995). A large sample increases the likelihood that the sample is representative of the larger population. Use of a small sample may make it difficult to detect significant differences or relationships.

Several threats to internal validity were considered. The threat of history was assessed prior to the study. The subjects were all nursing students in their last academic year of an associate degree nursing program at the same community college. These subjects had taken the same prerequisite courses for program entry and had started the nursing program at the same time; therefore history was not

considered a threat to the internal validity of the study.

Testing effects may have affected the internal validity of the study. The subjects completed the demographic data instrument and the GPSS before the CCTST. The GPSS is a psychometric scale designed to assess certain self-beliefs. It has been noted by Polit & Hungler (1995) that the simple act of collecting information from people changes them, particularly if the information collected deals with attitudes and opinions.

Implications

Education. It is imperative that nurse educators realize the significance of creating an environment which fosters the development of critical thinking skills. Although critical thinking is a disciplined process, one important aspect of the process is the student's willingness to evaluate and challenge, rather than accept.

Nursing students may think the way they do because they are rewarded for thinking that way. It may create less strife within an educational environment for the student to think like the teacher. The student may not be encouraged, or rewarded, for questioning and challenging. Traditional lecture style teaching and objective testing methods do not enhance the development of critical thinking skills.

Opportunities must be provided for nursing students to ask questions of one another, to listen to one another and to explore each other's ideas. The nursing students must learn to articulate rationale for their positions, opinions, and actions. This type of learning activity can only be successful in an environment which fosters open, thoughtful discussion and an environment which rewards the process or method without looking for the perfect outcome.

Social cognitive theory recognized the importance of actual success and failure in influencing later performance. In the educational process of nursing students, error must be viewed as a natural part of the learning process which can be used to improve future performance. Learning is an active, personal process and learners can reach the same goal by means of different paths. Bevis (1989) states "the availability of information about a given process, added to practice in the use of the process, increases the extent and frequency of successful achievement of the objectives of that process" (p. 10). Errors which occur in a nursing student's performance, when examined in light of the critical thinking process, can assist the nursing student in successfully evaluating the chain of incidents which led to the error, taking a potentially failing scenario and turning it into an actual learning success.

Practice. Health care agencies should be aware that most newly graduated nurses are not expert critical thinkers. The agencies need to provide guided encounters for the new nurse, preferable under the leadership of an experienced mentor, in order to further the development of critical thinking skills. Nursing is an applied science. Newly graduated nurses need role models skilled in critical thinking to work side by side with them. This type of mentorship will foster success in performance of the new nurse and facilitate the individual's skill development.

Recommendations

The literature indicates a relationship between critical thinking skills and perceived self-efficacy. A replication of this study with a larger sample would be recommended. Additionally, a longitudinal study might indicate changes that occur

as the student progresses in the learning process with regard to critical thinking skills and self-efficacy. A descriptive, qualitative approach may provide a different view of both critical thinking ability and perceived self-efficacy.

Further areas of study may include: determining reliable and valid measurement tools for critical thinking skills in the nursing population; determining reliable and valid measurement tools for perceived self-efficacy in the nursing population; determining teaching methods which facilate development of critical thinking skills;and determining teaching methods which foster the development of perceived self-efficacy.

Conclusion

Critical thinking is a vital skill for nurses and can be influenced by an individual's sense of self-efficacy. The academic community must explore ways to promote both the development of perceived self-efficacy and critical thinking skills in all nursing students.

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Appendix A

Sample from Inference Section of the

California Critical Thinking Skills Test

Example

Consider these statements true: "Stylish dressers are neither flashy nor dull. If someone is not flashy, then such a person is tasteful." Which of the following must be true, if both of the above are true?

A = Stylish dressers are neither tasteful nor dull.

B = If someone is a stylish dresser, that person is dull but tasteful.

C = Every stylish dresser is tasteful and not dull.

D = No tasteful dressers are dull.

E = None of the above.

Appendix B

The Generalized Perceived Self-Efficacy Scale*

*English version by Ralf Schwarzer & Matthias Jerusalem, 1993

Read each statement carefully. Then, respond to the statement using the following format:

1=Not at all true 2=Hardly true 3=Moderately true 4=Exactly true

	STATEMENT	*RESPONSE*
1	I can always manage to solve difficult problems if I try hard enough.	
2	If someone opposes me, I can find means and ways to get what I want.	
3	It is easy for me to stick to my aims and accomplish my goals.	
4	I am confident that I could deal efficiently with unexpected events.	
5	Thanks to my resourcefulness, I know how to handle unforeseen situations.	
6	I can solve most problems if I invest the necessary effort.	
7	I can remain calm when facing difficulties because I can rely on my coping ablilities.	
8	When I am confronted with a problem, I can usually find several solutions.	
9	If I am in trouble, I can usually think of something to do.	
10	No matter what comes my way, I am usually able to handle it.	

Appendix C

Demographic Questionnaire

ID Code_____

By completing the following questionnaire, I give my consent to participate in a study that examines critical thinking skills and self-efficacy.

1. GENDER _____ male
_____ female

2. AGE (in years) _____

3. MARITAL STATUS: _____ married
_____ never married
_____ divorced
_____ widow/widowed
_____ single & living with partner
_____ separated from spouse

4. NUMBER OF DEPENDENTS IN THE HOME (state actual number in the home; includes any/all persons currently living in the home with the student and for whom student assumes financial and/or nurturing responsibilities.):

_____ dependents in the home

5. EMPLOYMENT STATUS WHILE IN THE NURSING PROGRAM:

_____ full time (32-40 hrs/wk)
_____ part time (<32 hr/wk)
_____ not employed

6. ANNUAL HOUSEHOLD INCOME:

_____ < $20,000
_____ $20,000-29,999
_____ $30,000-39,999
_____ $40,000-49,999
_____ ≥$50,000

Appendix D

Verbal Script

Good morning(afternoon). My name is Christine Overly. I am a graduate student in nursing at Grand Valley State University. I am conducting a research study involving critical thinking skills in Associate Degree nursing students. This study is in partial fulfillment of the requirements for a Master's Degree in Nursing.

The procedure to participate in this study involves three activities: (1) completion of a demographic questionnaire; (2) completion of a critical thinking skills instrument; and (3) completion of self-efficacy instrument. This procedure will take approximately one hour and thirty minutes. Refreshments will be provided. The critical thinking skills instrument has 34 multiple choice questions. The self-efficacy instrument has 10 statements asking for a response rating of 1 through 4. The specific directions for completing the instruments will be given at the time the tools are administered.

Participation in this study may assist you in preparation for state board exams. The critical thinking skills instrument will provide you practice in determining the best response for multiple choice questions. You will need to use inference, recognition, deduction, interpretation, and evaluation.

You have been selected to be involved in this research project by virtue of the fact that you are close to completion of the nursing program here at your school. Your responses in this study will not affect your status as a nursing student or your grades. All of your responses will be held strictly confidential. The individual data will be identified by a code number. Your name will not be used in connection with

the results of the outcome of the study. Any reports of this study will contain group data only and may be released in the literature.

There are no anticipated risks to you in this study. You may receive some benefit in practicing your critical thinking skills. The results of this study could have an impact on curriculum development in schools of nursing and the teaching methods used. Institutions hiring graduate nurses can utilize the results in planning orientation sessions. Do you have any questions? (Respond according to the question(s).)

It is important to me that all who are interested have an opportunity to participate in this study. If you plan to participate in the study, it will occur on _____ _____ (provide date, time, place). Your participation is voluntary and you may choose to discontinue participation at any time. If you have any additional questions after I leave, they will be addressed at the time the study is conducted or you may contact me at the phone number and/or email address on my contact cards, which are available from me at the end of this session. If you would like to participate in the study, but have a conflict with the scheduled time, please see me at the conclusion of this meeting. Thank you for you consideration to participate in this study.

(If anyone is in attendance at the administration of the study that has not heard this script, it will be repeated prior to the administration of the data collection tools. Additional questions will also be addressed at that time.)