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# Predictors of NCLEX-RN Success Post 1988

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PREDICTORS OF NCLEX-RN SUCCESS POST 1988

By

Marie E. Rogers

A THESIS

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ABSTRACT

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This ex post facto correlation design study was completed to compare the relative ability of the National League for Nursing Diagnostic Readiness Test (NLN-DRT), nursing non-clinical grade point average, overall grade point average, and pre-nursing grade point average in predicting NCLEX-RN success. Records of 95 graduates from a particular associate degree nursing program were reviewed. The Pearson  $r$  identified the NLN-DRT to have the strongest correlation with NCLEX-RN success. All the independent variables had a high degree of correlation with one another. The multiple regression analysis revealed that the NLN-DRT accounted for 25% of the variance in NCLEX-RN success. The remaining independent variables added no further predictive value.

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## Chapter 1

### INTRODUCTION

Schools of nursing have a variety of tasks to accomplish with nursing students. The main concern of nursing education however, is to impart knowledge so that a nursing student can become an effective, accountable, competent professional in nursing practice (Woodham & Taube, 1986). In order to practice the profession legally, the graduate must obtain a nursing license. The National Council Licensure Examination for Registered Nurse License (NCLEX-RN) is the current evaluation for entry into practice. Nursing Education has an obligation to prepare graduates to succeed on the examination that measures minimal standards for safe practice (Washburn & Short, 1992). Not only is the school of nursing preparing the nursing graduate to become a professional in nursing practice, but also to pass the NCLEX-RN. This study is directed at predicting performance on the NCLEX-RN.

There are several reasons why schools of nursing pay close attention to NCLEX-RN results. One of these includes the use of the results in evaluating and comparing nursing programs. This may be done by students and or faculty (Ashley & O'Neil, 1991). The accreditation process also evaluates the school's graduates' NCLEX-RN pass rates (Marquis



& Worth, 1992). Schools of nursing show data of graduates' success on the NCLEX-RN in order to recruit prospective applicants. Schools that can show a consistently high pass rate on the NCLEX-RN are more successful in recruiting students. The NCLEX-RN pass rate is important to future graduates since a graduate cannot practice as a registered nurse until the NCLEX-RN is passed (Dell & Valine, 1990). For evaluation, accreditation, and recruitment processes, schools of nursing pay close attention to NCLEX-RN results.

Failure of the NCLEX-RN results in many negative consequences. The experience of failure may affect the student's self-esteem, thereby affecting self-confidence needed for professional competence. Career plans may be delayed resulting in potential financial problems (Ashley & O'Neil, 1991). The institution will not have as many newly licensed personnel. Peers may experience personal loss when classmates fail. Faculty may experience loss over time and energy they feel was of no use in assisting the student to achieve. Families sacrifice financial resources to allow students to have an education (Lengacher & Keller, 1990). Consequently, many people are affected by a graduate's failure on the NCLEX-RN.

Passing the NCLEX-RN is a goal for all nursing graduates. Schools have a variety of admission criteria and students have a variety of learning needs and styles. The ultimate goal is to identify the student likely to experience difficulty passing the NCLEX-RN. This allows for early intervention

before admission or during the program thereby resulting in a decrease in educational cost both in time and dollars (Jenks, Selekman, Bross, & Paquet, 1989). Further, early identification of an "at risk" student will prevent the potential negative consequences previously discussed. The "at risk" nursing student may be given assistance in the form of instructor or peer tutoring, remedial English programs, or placed in special study groups in order to enhance success in the nursing program and thus be better prepared to pass the NCLEX-RN.

Identifying variables that enhance passing the NCLEX-RN will help faculty in working with nursing students. These variables can be useful to present feedback to the student on potential NCLEX-RN success. Students should be placed into remedial programs in order to ensure NCLEX-RN performance (Horns, O'Sullivan, & Goodman, 1991).

Schools of nursing have examined admission data, nursing course grades, and a variety of achievement tests including National League for Nursing (NLN) Achievement Tests, NLN Diagnostic Readiness Test (NLN-DRT), and Mosby Assess Test, as possible predictors of success on the NCLEX-RN. Variables such as high school grade point average, Scholastic Aptitude Test (SAT) score, individual and composite College Admission Test (ACT) scores, and pre-nursing college grade point average may be included in admission data. A correlation between academic admission data and NCLEX-RN success has been shown by many studies (Felts, 1986; Horns et al., 1991; Lengacher &

Keller, 1990; McKinney, Small, O'Dell, & Coonrod, 1988; Payne & Duffey, 1986; Wold & Worth, 1990). Schools of nursing can predict which applicants will be successful on the NCLEX-RN based on these studies. However, caution must be followed in using these data. Remedial programs should be set up to ensure success during the nursing program and on the NCLEX-RN.

Nurse educators are concerned about the relationship of achievement tests and nursing non-clinical course grades to the NCLEX-RN. Investigators (Fowles, 1992; Jenks et al., 1989; Lengacher & Keller, 1990; Younger & Grap. 1992) have analyzed the relationship between these two variables and NCLEX-RN performance. Nursing non-clinical course grades and achievement tests were indicated as NCLEX-RN predictors. Dell and Valine (1990) and Waterhouse, Carroll, and Beeman (1993) found that nursing non-clinical grades were useful in predicting NCLEX-RN performance. With these findings, nurse educators can identify, early in the program, students who are likely to be successful on the NCLEX-RN and begin interventions with those students at risk for NCLEX-RN failure.

The majority of the research studies have been done on either the State Board Examination given until July, 1982 or the NCLEX-RN given prior to 1988 when numerical scores were reported. Beginning in 1988, the NCLEX-RN reported performance on a pass/fail basis. This pass/fail test focused on client needs whereas the scored NCLEX-RN focused on decision making (Matassarini-Jacobs, 1989). Since a focus of

curricula in schools of nursing includes covering the areas identified on the NCLEX-RN, curricula now need to focus on client needs. In 1991, the National Council of State Boards of Nursing voted to change the NCLEX-RN from a paper-pencil test to a computer adaptive testing (CAT) format. Students need to develop a CAT comfort level prior to the NCLEX-RN to enhance NCLEX-RN success. With the change in NCLEX-RN focus and format, research studies that describe variables contributing to success or failure on the pass/fail and the CAT NCLEX-RN should continue to be undertaken.

Research studies examining the predictors of NCLEX-RN results have generally looked at a variety of variables. These have included: grade point averages (GPA) from high school, GPA from pre-nursing college courses or nursing non-clinical courses, overall GPA, and achievement tests. This study was directed at predicting performance on the NCLEX-RN using the variables of the NLN-DRT, nursing non-clinical GPA, overall college GPA, and the pre-nursing GPA. The purpose of this study was twofold: 1) to compare the relative ability of the NLN-DRT, nursing non-clinical GPA, overall GPA, and pre-nursing GPA in predicting NCLEX-RN success by graduates of a particular associate degree nursing program; and 2) to add to the growing body of knowledge, especially as it relates to academic performance in associate degree nursing (ADN) programs.

## Chapter 2

### CONCEPTUAL FRAMEWORK AND REVIEW OF THE LITERATURE

#### Conceptual Framework

Imogene King's (1981) theory of goal attainment served as the theoretical framework for this study. King's theory focuses on process which includes action, reaction, interaction, and outcome comprised of transaction or goal attainment. Applied specifically to this study, it aims at the overall communication and decision-making process that occurs between the nurse educator and nursing student as the student moves through the nursing program.

Nursing is a process of action, reaction, interaction, and transaction according to King (1981). In the theory of goal attainment, a major premise is that two people come together in a health care organization to help or to be helped to maintain a state of health that permits functioning in a variety of roles. This process occurs between individuals and groups in social systems. The goal is to achieve health or to adjust to health problems. King suggests that since man functions in social systems, a theory for nursing must include man's interaction with the environment as well as the complex dynamics of human behavior. There are three interacting systems in King's (1981) theory that suggest the inter-

relationship among individuals, groups, and society. The theory is a systems approach that was the basis of the original framework. This describes human beings and nursing as parts of personal, interpersonal, and social systems.

Goal attainment, according to King, is derived from interpersonal systems, whereby the nurse and client represent one type of interpersonal system. Concepts from the theory of goal attainment are: perception, judgment, action, reaction, interaction, and transaction. The process is illustrated in Figure 1, based on King's theory (1981). Goal attainment results in outcomes that are measurable events.

The nurse in this instance is the nurse educator and the client is the nursing student. The theory describes the nature of nurse educator/nursing student interactions that lead to the achievement of goals. In this situation, the nurse educator and nursing student will interact through the teaching-learning process to obtain the mutually identified goal of passing the NCLEX-RN.

King (1981) defines perception as each person's representation of reality. The individual's awareness of objects, events, persons, and self gives meaning to experiences. Judgments of the value of objects and events is based on these perceptions. King suggests that action is based on the judgment of reality. Verbal and nonverbal action involves a sequence of behaviors related to the recognition of conditions, and efforts to control events.

Both the nurse educator and the nursing student are open

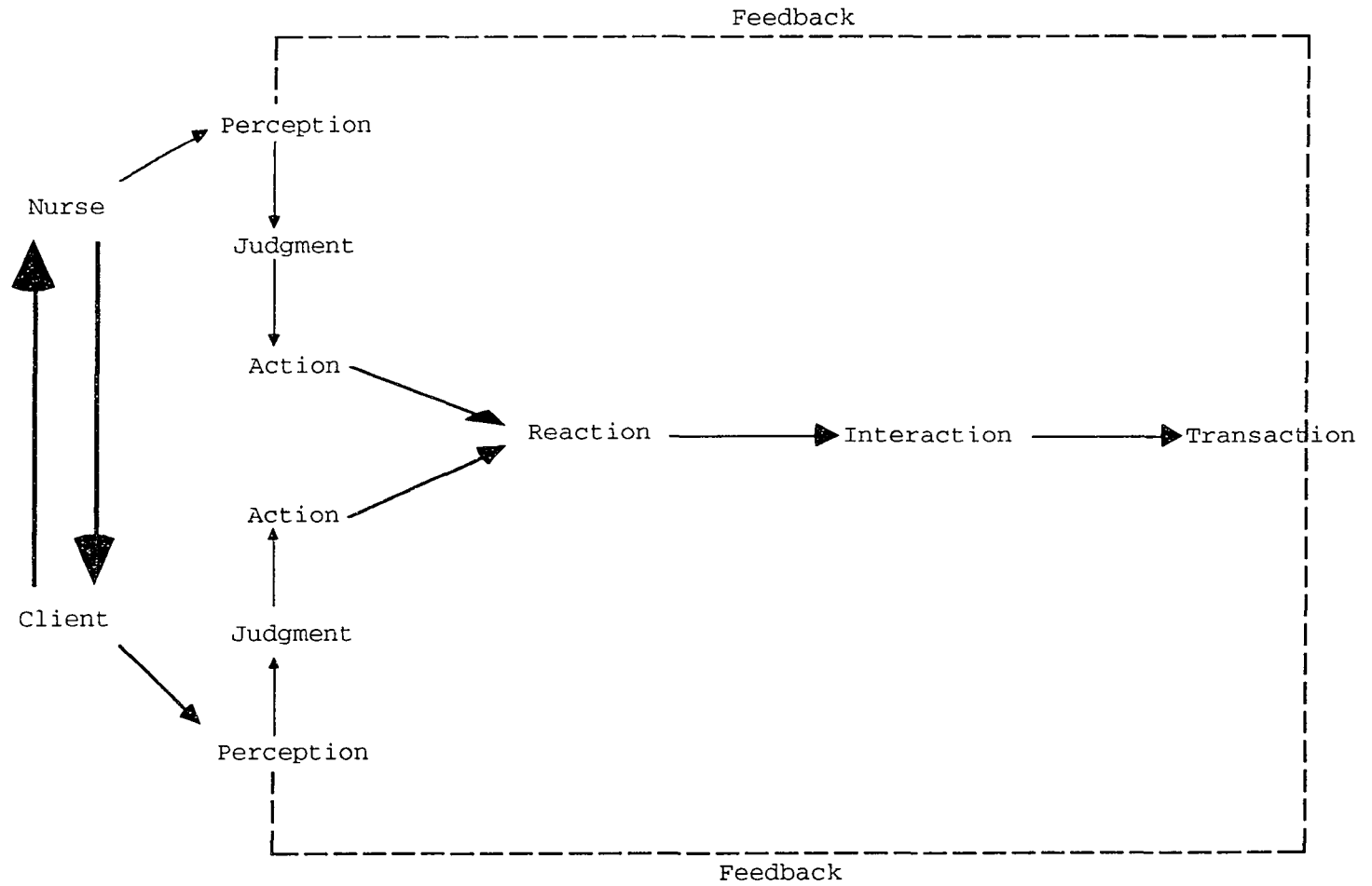


Figure 1  
A process of human interaction, King, 1981

systems interacting with the environment (King, 1981). The nursing student enters the relationship with unique learning needs due to a variety of educational, work, and personal experiences. Each nursing student differs in his/her motivation, interest, and attitudes toward learning (Carpenito & Duespohl, 1985). These learning needs and differences impact the perception, judgment, action, and reaction components of King's Human Process Model. Nursing students react as total organisms responding to the perception of the environment and experiences including knowledge. Reactions take place in each learning situation. Observed behavior of the nurse educator and nursing student provides information from which inferences are made about reactions. The two persons react to each others' perceptions and to the situation. Reactions occur in the perceptual milieu of the interacting individuals (Daubenmire & King, 1973).

According to King (1981), interaction is defined as a process of perception and communication between person and environment. Interaction provides the process to allow the nurse educator and nursing student to set goals for learning. During the interaction, the nurse educator and nursing student bring knowledge, needs, goals, past experiences, and perceptions to the teaching-learning process. These influence the decision-making process during interaction. King believes that individuals interact with each other and the situation for goal identification.

The goal of the teaching-learning process is a



transaction between the nurse educator and nursing student in which specific learning objectives are met by a planned sequence of events. These include selection of learning objectives, definition of content, identification of teaching strategy, and evaluation of outcome (Carpenito & Duespohl, 1985). When nursing students engage in the teaching-learning process, they interact with many internal and external experiences that lead to changes in attitudes and behaviors. The nurse educator facilitates this process by helping nursing students to achieve goals through mutually agreed upon plans.

Transaction is viewed by King (1981) as an observable outcome in achievement of valued goals and is influenced by role expectation and role performance. Transaction involves bargaining, negotiation, and social exchange. Transaction is the communication with the environment that leads to goal attainment and is viewed as growth and development. The nurse educator promotes growth and development by facilitating nursing students' acquisition of knowledge and skills to maximize the potential to pass the NCLEX-RN.

Feedback is conceived as a means of altering or clarifying a message which may result in a new message for both the nurse educator and nursing student (Daubenmire & King, 1973). Feedback may impact perception, judgment, action, and reaction. It may result in a change in the interaction. The feedback given by the NLN Test or the GPA may have an impact on the interaction between the nurse educator and nursing student. It may lead to a change in the

teaching-learning process so that review courses or remediation can be done to ensure that the goal of passing the NCLEX-RN is attained. On the other hand, feedback may indicate that the nursing student is making appropriate progress toward the goal.

During the process of perception, judgment, action, and interaction, the nurse educator assists the nursing student to establish goals and discuss alternative measures for goal achievement. The education mode of goal attainment involves communication with the nursing student for identification of goals and problem resolution. Figure 2 illustrates a diagram of nurse educator/nursing student interaction based on King's Theory (1981). The literature review was based on each of the study variables identified in the diagram.

#### Literature Review

The literature review has been divided into two parts: 1) a review of the literature identifying predictors of NCLEX-RN success based on grade point averages; and 2) a review of the literature relating achievement testing to NCLEX-RN success.

Grade point averages. Studies correlating GPA with NCLEX-RN success center around pre-nursing or pre-requisite science GPA, nursing non-clinical GPA, and overall GPA. Pre-nursing GPA includes the GPA from all courses taken before admission into a nursing program.

Whitley and Chadwick (1986) studied a bachelor of science in nursing (BSN) program (n=176) to determine why an increase

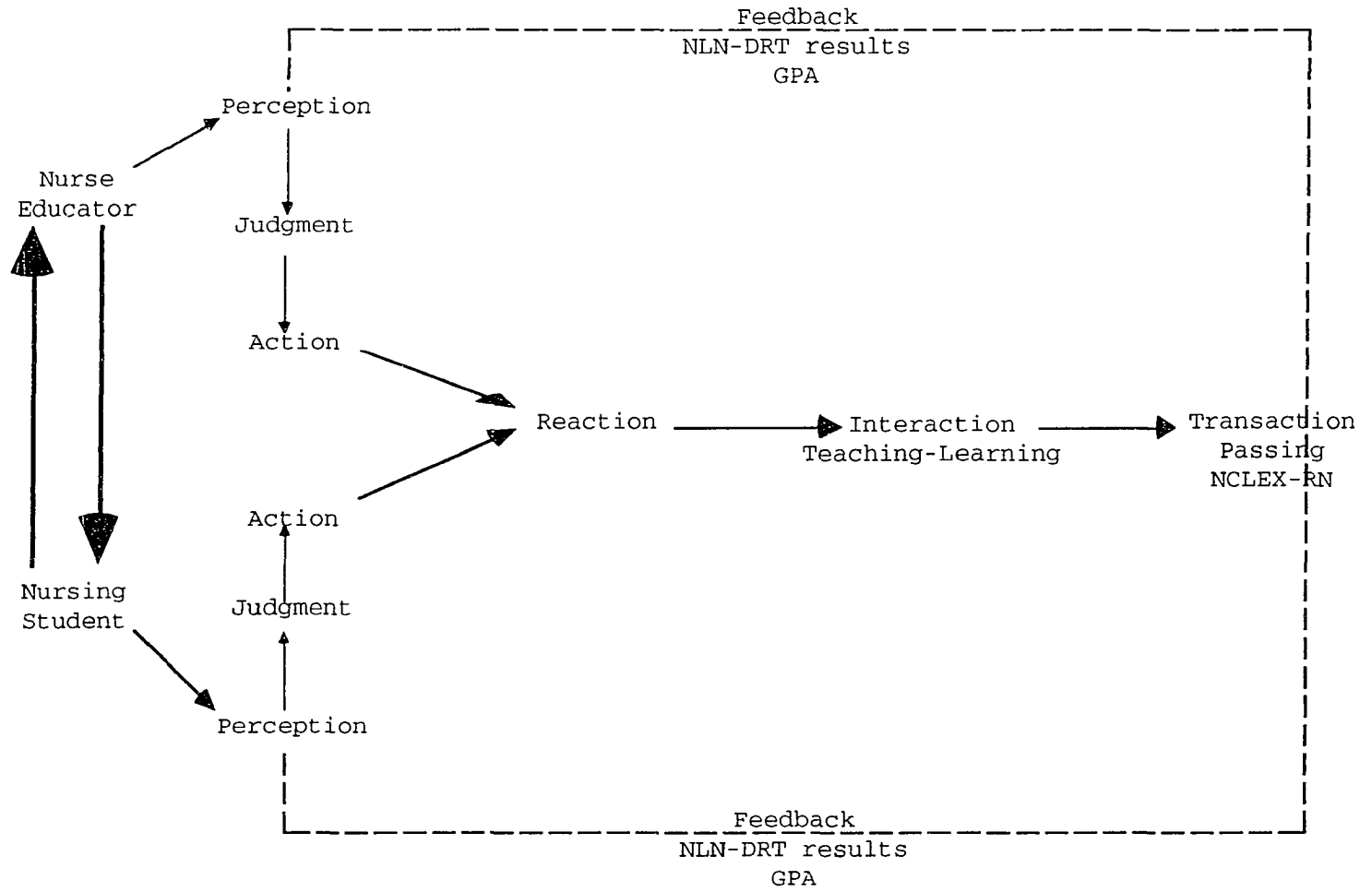


Figure 2  
Nurse educator/Nursing student interaction

in NCLEX-RN failures had occurred. They looked at age, marital status, ethnicity, SAT verbal and math scores, pre-science GPA, pre-nursing GPA, junior and senior test scores, and exit GPA. Of all the variables, pre-requisite science GPA ( $r=.4762$ ) and pre-nursing GPA ( $r=.4282$ ), senior test scores ( $r=.6813$ ), and exit GPA ( $r=.6672$ ) were the most reliable predictors of success on the NCLEX-RN.

In another study of 144 students in a BSN program (Payne and Duffey, 1986), it was determined that pre-nursing GPA and SAT verbal scores accounted for 33% of the variance in NCLEX-RN scores. SAT verbal scores and pre-nursing GPA were also shown to be correlated with NCLEX-RN success in studies by Foti and DeYoung (1991) and McKinney et al., (1988).

Quick, Krupa, and Whitley (1985) studied a BSN program ( $n=182$ ) to determine which indicators of student academic status at the time of program application could predict NCLEX-RN success. Standardized discriminant function coefficients revealed that GPA at the end of the freshman year made the greatest contribution to NCLEX-RN success. SAT verbal scores and anatomy and physiology grades were also directly related to NCLEX-RN success. General chemistry and biochemistry grades were inversely related to NCLEX-RN performance.

Pre-nursing GPA and ACT scores were found to have a positive correlation with NCLEX-RN success in some studies. Pre-nursing GPA was shown to have a significant correlation with nursing GPA and NCLEX-RN success in studies by McKinney et al. (1988), Wold and Worth (1990), and Yang, Glick, and

McClelland (1987). Many investigators have completed studies documenting a positive correlation between pre-nursing GPA and NCLEX-RN success (Felts, 1986; Fowles, 1992; Glick, McClelland, & Yang 1986; Lengacher & Keller, 1990; McClelland, Yang, & Glick, 1992; Yang et al., 1987).

Some significant findings have been reported in studies regarding pre-nursing GPA and NCLEX-RN success. However, these may not be reliable in today's education arena. College is started for some at a later age and some are changing to a nursing career after already having another degree. There may be lengthy time periods between some college course work. These factors may affect the correlation between pre-nursing GPA and NCLEX-RN success (Jenks et al., 1989).

Non-clinical nursing courses are those taken in a classroom. Grades from non-clinical and clinical courses are usually reported separately. Many students generally take all the required nursing courses at the institution they are graduating from, therefore, it is appropriate to study non-clinical course GPA and NCLEX-RN success (Krupa, Quick, & Whitley, 1988). This is especially the case in most ADN programs.

Several studies have focused on nursing non-clinical GPA. Payne and Duffey (1986) reported, that by the end of the junior year, 65% of the students were correctly identified as being at risk for passing the NCLEX-RN based on nursing non-clinical GPA. Whitley and Chadwick (1986) identified graduates at significantly high risk for NCLEX-RN failure as

those with low SAT scores, low cumulative and science GPA's, scores below the mean on school of nursing exams, and GPA's that drifted downward during the nursing education. Lengacher and Keller (1990) identified two nursing non-clinical courses (Nur 2712, Nursing Process 1V,  $r=.77$ ; Nur 2713, Nursing Process V,  $r=.79$ ) in the second year of an AD program ( $n=146$ ) as being the best predictors of NCLEX-RN success. Information regarding nursing non-clinical GPAs correlating significantly with NCLEX-RN success has also been identified in studies by Horns et al. 1991, Jenks et al. 1989, Marquis and Worth, 1992, McKinney et al. 1988, Mills, Sampel, Pohlman, and Becker, 1992, Woodham and Taube, 1986, and Younger and Grap, 1992.

Krupa et al. (1988) studied a BSN program ( $n=213$ ) to determine if grades from required nursing courses would predict NCLEX-RN success. Discriminant function analysis of grades from selected nursing non-clinical courses required for graduation showed that grades in all non-clinical courses were significantly related to NCLEX-RN performance. Their findings also showed that the two best predictors of NCLEX-RN performance occurred early in the students' nursing education. The best predictor was the grade in the Introduction to the Process of Nursing Course (predicted in 76% of the cases) taken at the beginning of the sophomore year. This course stressed the nursing process which is also stressed throughout the NCLEX-RN. The second best predictor was the Medical-Surgical II non-clinical course (predicted in 64% of the cases) taken during the junior year. In this course, students

add to their theoretical knowledge base while applying the nursing process to patient care. The Medical-Surgical I course also showed a high correlation (predicted in 61% of the cases) with the NCLEX-RN success. The least reliable predictors of success were clinical courses: Medical-Surgical I practicum (predicted in 24% of the cases), Community Mental Health practicum (predicted in 19% of the cases), and Medical-Surgical practicum II (predicted in 16% of the cases).

Nursing non-clinical grades can be helpful predictors of NCLEX-RN performance. However, clinical nursing courses have not been reliable predictors. Krupa et al. (1988) indicate that a dichotomy exists between nursing clinical and nursing non-clinical grades as NCLEX-RN predictors. A lack of a uniform, criterion-based method of evaluation of students in the clinical setting may contribute to the fact that clinical grades are poor predictors of NCLEX-RN performance. Faculty bias may also occur and should be considered when reviewing clinical grades.

Overall GPA is sometimes referred to as exit GPA. This variable is calculated routinely on every student in college. Information regarding overall GPA as a predictor of NCLEX-RN success would assist the graduate in considering additional preparation prior to taking the NCLEX-RN.

Waterhouse et al. (1993) studied a BSN program (n=257) to identify variables that might be predictors of NCLEX-RN success. The graduates took the NCLEX-RN exam from 1988 to 1990. Of the 15 variables tested, the GPA at graduation was

the best predictor ( $r=.248$ ) of NCLEX-RN success. The second best predictors were the grades at the end of the senior level nursing course and the pathophysiology course.

In a study done by Lengacher and Keller (1990) in an ADN program ( $n=146$ ), the best predictor of NCLEX-RN success was the overall GPA ( $r=.71$ ,  $p<.01$ ). The composite ACT score was the second best predictor. Significant positive correlations between overall GPA and NCLEX-RN success were found in studies done by Foti and DeYoung (1991) and McKinney et al. (1988) as well. Grades in nursing courses and overall GPA appear to be the most stable single predictors of NCLEX-RN success (Foti & DeYoung, 1991).

Achievement testing. Nursing achievement tests include among others; the NLN Achievement, NLN-DRT, and the Mosby Assess Test. The NLN Achievement Tests are given at the end of each nursing course and the NLN-DRT is given as an overall assessment test in the last year of the nursing curriculum to determine NCLEX-RN readiness. The Mosby Assess Test is also given at the end of the nursing curriculum. Several studies have included these tests as predictors for NCLEX-RN success.

Foti and DeYoung (1991) determined the Mosby Assess test to be the best predictor ( $r=.66$ ,  $p<.0001$ ) of NCLEX-RN success in a BSN program ( $n=298$ ). In studies done by Fowles, (1992), Horns et al. (1991), Jenks et al. (1989), McKinney et al. (1988), Wall, Miller, and Widerquist (1993), and Younger and Grap (1992), significant correlations between the Mosby Assess test and NCLEX-RN success were also documented. These studies



have shown the Mosby Assess test to be a moderate to strong predictor of NCLEX-RN success (Foti & DeYoung, 1991). Since the Mosby Assess test is a standardized examination, the correlations between it and NCLEX-RN success could be generalized to other nursing programs (Jenks et al., 1989).

A general review of the literature shows that GPAs including pre-nursing GPA, nursing non-clinical course GPA, overall GPA, and achievement testing are useful predictors of NCLEX-RN success. Grades from clinical nursing courses have not been documented to be reliable predictors of NCLEX-RN success. Krupa et al. (1988) point out the difference in nursing clinical versus nursing non-clinical grades as predictors of NCLEX-RN success. They mention that the lack of a uniform, criterion-based method of evaluating student nurses in the clinical setting may contribute to clinical grades being poor predictors of NCLEX-RN success.

In conclusion, the literature identified a variety of variables that are significantly correlated with NCLEX-RN success. In many studies, it was determined that one variable may be the best predictor, but adding 1 or 2 more variables to the first, provided a stronger prediction of NCLEX-RN success. No one variable was consistently identified.

A small number of studies have been identified in the literature using data from ADN programs in predicting NCLEX-RN success. This data identified admission variables (SAT verbal scores, pre-nursing GPA, and high school rank), nursing non-clinical course GPA, overall GPA, and NLN tests as predictors

of NCLEX-RN success (Lengacher & Keller, 1990; Oliver, 1985; Woodham & Taube, 1986). The majority of studies documented data from BSN programs and were done prior to 1988 when the NCLEX-RN was a scored test and focused on decision making.

Most of the studies documented a positive correlation between NLN course tests or the Mosby Assess tests and NCLEX-RN success. A study done by Wall et al. (1993) documented the relationship between the NLN-DRT and NCLEX-RN success as well.

### Hypothesis

Based on the stated purposes and the review of the literature, the following hypothesis was formed:

The NLN- DRT will account for a greater proportion of the variance in NCLEX-RN success results than nursing non-clinical GPA, overall GPA, or pre-nursing GPA.

### Definitions

There are several terms and abbreviations used in this study. There is one dependent variable and four independent variables.

Dependent Variable. The National Council Licensure Examination for Registered Nurses (NCLEX-RN) is a criterion referenced examination. It is an integrated licensure examination organized in the nursing process format with client needs as the focus. The score is reported as a Pass/Fail. A goal of the graduate is to pass this test in order to practice as a registered nurse. This test was implemented in 1988. In the study, scores from this

examination (NCLEX-RN) represent the dependent variable.

Independent Variables. The NLN-DRT is a test that parallels the NCLEX-RN test plan. It assesses students' nursing ability, skill, and knowledge. An individual earned score between 0 and 172 is reported to the student. The test also provides each student with a diagnostic report of strengths and weaknesses and a statement about the likelihood of success on the NCLEX-RN (National League for Nursing, 1994).

Nursing non-clinical GPA is the cumulative GPA of the nursing courses taught only in the classroom, excluding the practical experience.

Overall GPA is a cumulative GPA of all college courses taken. It is computed at the end of the last course taken in the nursing program.

The pre-nursing GPA is a GPA computed on 7 pre-requisite courses taken before admission into the nursing program under study. The courses are: Health Careers Math, Medical Terminology, Cell Biology, Chemistry, Anatomy and Physiology, Microbiology, and Interactions in Nursing.

## Chapter 3

### METHODOLOGY

#### Research Design

This study was an ex post facto correlation design using a review of records of the graduates of an associate degree of nursing (ADN) program for Fall, 1989 through Winter, 1991. This study was completed to determine the effectiveness of the NLN-DRT, nursing non-clinical GPA, overall GPA, and pre-nursing GPA as predictors of NCLEX-RN success and to add to the body of knowledge regarding predictors of NCLEX-RN success for graduates from ADN programs taking the NCLEX-RN after 1988.

#### Sample and Setting

The sample for this study consisted of students from an ADN program graduating from Fall, 1989 through Winter, 1991. There was a total of 120 students who graduated in these classes. The students took the NCLEX-RN within six months after graduation. The sample size consisted of 95 students from four different classes of students. During this time period, there were no major curriculum or faculty changes. The content of nursing non-clinical courses was taught by the same nursing faculty. The students were highly encouraged to take the NLN-DRT during the last week of the semester upon

completion of the second year of the ADN program. However, not all students did take the test. Those who did not take the test were not included in the sample. Not all students agreed to release information regarding NCLEX-RN performance to the college. Those were not reported in the sample. The students in the sample were predominantly female and Caucasian.

Program Description. The ADN program in this study was established in August of 1970 and is located in a midwest, metropolitan area. It is a two year ladder program that allows students to leave after successful completion of the first year to take the license examination for practical nursing. Licensed practical nurses (LPNs) can apply and enter the program between the first and second year. Upon successful completion of the second year, the Associate Degree in Applied Sciences with a Major in Nursing is awarded and the graduate is eligible to take the NCLEX-RN.

#### Procedure

Data was collected from records and entered into the computer for analysis. The pre-nursing GPA, nursing non-clinical GPA, and overall GPA were obtained from transcripts. The NLN-DRT scores were reported to the school from the NLN. NCLEX-RN pass or fail results were reported by the Michigan Board of Nursing.

The grading scale used by the ADN program for the nursing courses is: 94-100%=A, 82-93%=B, 70-81%=C. These percentages are reported to the records office as A=4, B=3, C=2.

Any course below 70% or 2.0 is considered as not passing and the course must be repeated to receive credit for graduation. Where records show a repetition of a course, the grade from the repeated course was used.

This ex post facto research study was exempt from Human Subject Review as information from educational testing was being used. To maintain anonymity, all identifying information was removed by the nursing secretary prior to data collection. Any files of students with missing data were excluded from this study.

## Chapter 4

### DATA PRESENTATION AND ANALYSIS

The purpose of this study was to compare the relative ability of the NLN-DRT, nursing non-clinical GPA, overall GPA, and pre-nursing GPA in predicting the NCLEX-RN success by graduates of a particular ADN program.

#### Hypothesis

The hypothesis to be tested was: The NLN-DRT will account for a greater proportion of the variance in NCLEX-RN success results than nursing non-clinical GPA, overall GPA, or pre-nursing GPA. Data from the four classes of nursing students was analyzed in aggregate. This hypothesis was supported by the data.

#### Data Presentation

The nursing non-clinical GPA, overall GPA, and pre-nursing GPA were calculated and entered into the computer. Since the NCLEX-RN is reported as a pass/fail score, a #1 was assigned as a fail score and a #2 as a pass score. The NLN-DRT was given at the conclusion of the nursing program. A maximum score of 172 could be earned. The student scores reported ranged from 97 to 154. The scores were recorded and entered into the computer.

The mean score for the independent variables was

calculated. The mean NLN-DRT score was 127.54 with a median score of 130 and a range from 97 to 154. In the nursing non-clinical GPA, the mean was 3.23 with a range from 2.4 to 4.0. The mean for the overall GPA was 3.18 with a range from 2.15 to 3.98. The mean for the pre-nursing GPA was 3.09 with a range from 2.11 to 4.00. In this study (n=95), 86 passed the NCLEX-RN.

The Pearson  $r$  was used to examine the relationships among the variables (Polit & Hungler, 1991). Table 1 shows the correlation for the independent variables NLN-DRT, nursing non-clinical GPA, overall GPA, and pre-nursing GPA with the dependent variable NCLEX-RN. The NLN-DRT showed the strongest correlation with the NCLEX-RN ( $r=.495$ ) followed by the nursing non-clinical GPA ( $r=.36$ ), overall GPA ( $r=.30$ ), and pre-nursing GPA ( $r=.24$ ). All of the independent variables demonstrated a high degree of positive correlation with each other as well.

Multiple regression analysis indicated the best predictor for NCLEX-RN success was the NLN-DRT ( $r^2=.245$ , sig =.0000). The addition of any of the remaining variables added no further predictive value. Thus the GPAs added no significance to the explanation of the variance of NCLEX-RN success beyond that of the NLN-DRT. This can probably be attributed to the fact that the independent variables are highly correlated.



Table 1

Correlation of NLN-DRT, Nursing Non-Clinical GPA, Overall GPA, and Pre-Nursing GPA with NCLEX-RN.

Variable	NCLEX-RN	NLN-DRT	Nursing Non-Clinical GPA	Overall GPA	Pre- Nursing GPA
NCLEX-RN	1.000 ( .95) p= .	.4953 ( .95) p= .000	.3585 ( .95) p= .000	.3005 ( .95) p= .002	.2419 ( .95) p= .009
NLN-DRT		1.000 ( .95) p= .	.6250 ( .95) p= .000	.5134 ( .95) p= .000	.4605 ( .95) p= .000
Nursing Non-Clinical GPA			1.000 ( .95) p= .	.8196 ( .95) p= .000	.6445 ( .95) p= .000
Overall GPA				1.000 ( .95) p= .	.7627 ( .95) p= .000
Pre-Nursing GPA					1.000 ( .95) p= .

The Pearson  $r$  correlation (Table 1) and the multiple regression analysis indicates that the NLN-DRT tends to be more predictive of success on the NCLEX-RN than the nursing non-clinical GPA, overall GPA, or pre-nursing GPA. The NLN-DRT accounts for 25% of the variance in NCLEX-RN success. The data provided supports the hypothesis.

## Chapter 5

### DISCUSSION AND IMPLICATIONS

#### Summary

The purpose of this research study was to compare the relative ability of the NLN-DRT, nursing non-clinical GPA, overall GPA, and pre-nursing GPA in predicting NCLEX-RN success. The study included four groups of nursing students enrolled in an ADN program graduating from Fall, 1989 through Winter, 1991. Of the nursing students in these classes, 95 had complete data files. All nursing students included in this study graduated and took the NCLEX-RN examination. The State Board reported that 86 of the graduates did pass the NCLEX-RN.

The four predictor variables were analyzed using the Pearson  $r$  correlation coefficient and multiple regression analysis. The results indicated a significant correlation between the NLN-DRT and the dependent variable NCLEX-RN. The NLN-DRT accounted for 25% of the variance in NCLEX-RN success. The three remaining independent variables; the nursing non-clinical GPA, overall GPA, and pre-nursing GPA added no further predictive value. This was attributed to the high degree of positive correlation between the independent variables.

### Limitations

The following limitations affect the generalization of the findings of this study and must be considered before conclusions can be drawn. Random sampling did not occur due to the nature of this study. Students are admitted to the first year of the nursing program based on fixed entrance requirements. The students continue into the second year based on their interests and personal situation. The results in this study are based on one institution in a midwest, metropolitan area. Generalization to other institutions must be made with caution.

The NCLEX-RN results are reported by the State Board as a pass/fail. In analyzing this data, a #1 was given to a fail and a #2 given to a pass. In this way the Pearson r correlation coefficient and multiple regression analysis were determined. A more accurate analysis could occur if the individual NCLEX-RN scores were available.

This study focused only on academic variables. Non-academic variables such as age, work or life experience, anxiety, or self-esteem were not studied. These may also have had an impact on NCLEX-RN success.

### Discussion

This ex post facto study investigated the correlation of four independent variables and one dependent variable. The independent variables were chosen for this study because of documented recognition as predictors of NCLEX-RN success in previous studies. As a result of this study, it was found

that there is a correlation between the NLN-DRT and the dependent variable (NCLEX-RN). Performance on the NLN-DRT was more predictive of NCLEX-RN success than were any of the GPAs. In the original hypothesis of this study, the NLN-DRT was projected to be more predictive of success of ADN graduates on the NCLEX-RN than GPAs. This hypotheses was established on the following assumptions: (a) GPAs are generally based on the average of instructor made tests and are therefore, less related to the NCLEX-RN. (b) The NLN-DRT is given at the end of the nursing education when the nursing student has the level of knowledge similar to that when taking the NCLEX-RN. (c) The NLN-DRT is a test which parallels the NCLEX-RN and provides information about the likelihood of NCLEX-RN success.

Data analysis indicated that the NLN-DRT had the strongest correlation of the independent variables with the NCLEX-RN. The Pearson  $r$  further demonstrated a high degree of positive correlation among all the independent variables. Multiple regression analysis indicated the best predictor for NCLEX-RN success was the NLN-DRT. The addition of any of the remaining variables added no further predictive value. This can probably be attributed to the high degree of correlation among the independent variables which violates one of the assumptions for completing a multiple regression analysis (Loether, 1993).

Waterhouse, Bucher, and Beeman (1994) pointed out that it is more difficult to accurately predict NCLEX-RN success after 1989 since correlations that are based on dichotomous

variables that mostly fall into one category (Pass) produce lower correlations than those between two continuous variables, such as numerical scores. If individual NCLEX-RN scores were available, a more accurate analysis of the independent variables as predictors of NCLEX-RN success could have occurred.

If the NLN-DRT accounted for 25% of the variance in NCLEX-RN success and the GPAs added no further predictability, then the question remains, what accounts for the remaining variance? Other variables not identified in this study may result in different findings. A similar question was addressed in a study done by Dell and Valine (1990). In this study (n=78) of BSN students, overall GPA accounted for 58% of the variance in NCLEX-RN success. The question remained what accounted for the remaining variance? Other variables not identified in the study may have accounted for the remaining variance.

The results of graduates in this study who took the NCLEX-RN showed that 91% passed the test. Other factors must also be considered in explaining this performance. Class sizes were small, which allowed faculty to give students close counseling and individual attention if needed. This allowed the at risk student to be tutored thus lowering the attrition in the program and increasing the students chance for NCLEX-RN success. Quick et al. (1985) supported the concept of identifying nursing students likely to have difficulty passing the NCLEX-RN early on, so that faculty can provide extra

counseling and/or instruction for them. Students could be identified based on GPA. Extra assistance could be given to the student with a low GPA in the form of remedial programs, faculty or peer tutoring, or by using resources such as English labs to help with language development.

Entry into the nursing program was controlled by admission criteria, and nursing students were required to maintain a 70% (GPA of 2.0) in all nursing courses. The NLN-DRT was not mandatory and there was not a minimum score or percent required on this test. However, data from this study and previous studies done by Foti and DeYoung (1991), Fowles (1992), Horns et al. (1991), Jenks et al. (1989), McKinney et al. (1988), Wall et al. (1993), and Younger and Grap (1992) indicates that an achievement test given at the end of the nursing program is a moderate to strong predictor of NCLEX-RN success and therefore, nursing students should take this test.

The NLN-DRT results may also be helpful to the nursing faculty. Based on the results, nursing faculty may identify areas where the curriculum needs to be changed. These changes in turn will assist future nursing students in obtaining higher NLN-DRT scores.

Based on King's theory of goal attainment (1981), the results of the NLN-DRT can be used as feedback and thereby have an impact on the interaction between the nurse educator and nursing student. The NLN-DRT result could lead the nurse educator to recommend to the nursing student that NCLEX-RN review courses be completed to ensure that the goal of passing

the NCLEX-RN is attained (Waterhouse et al. 1993). There is generally time available for the nursing student to be able to do this prior to completing the NCLEX-RN. The NLN-DRT results communicate to the nursing student the specific areas to review prior to the NCLEX-RN as well. On the other hand, feedback could indicate that the nursing student is making appropriate progress toward the goal. Obviously, the NLN-DRT score alone is not what allows for NCLEX-RN success, but rather basic knowledge is necessary for assuring a higher NLN-DRT score.

Utilizing King's theory of goal attainment (1981) and based upon this research study, it may also be possible to identify the NLN-DRT as the goal. This would be appropriate since the NLN-DRT was the best predictor of NCLEX-RN success. If the nursing student did well on the NLN-DRT, he/she would be successful as well on the NCLEX-RN. Since the nursing non-clinical GPA and the NLN-DRT were highly correlated, the nursing non-clinical GPA could be used to provide feedback early in the nursing program. In this manner, nursing students requiring assistance could be identified early on and then given the assistance needed throughout the nursing program in order to be successful on the NLN-DRT and ultimately the NCLEX-RN.

#### Recommendations

Several recommendations for further research based on the results of this study are identified. First, this study could be enlarged upon to include additional non-academic variables.



Such variables might include: age, work or life experience, ethnicity, self-esteem, and anxiety. Combinations of these variables might be shown to be predictors of NCLEX-RN success. Wisdom and maturation are acquired with age. These along with life or work experiences may enhance the teaching-learning process thereby allowing the nursing student to move toward the goal of NCLEX-RN success. A positive self-esteem and decreased anxiety may be important factors in the nursing student's ability to do well taking tests and ultimately passing the NCLEX-RN.

This study could be replicated with a larger number of ADN graduates. The largest nursing student body taking the NCLEX-RN is in the ADN program (Lengacher & Keller, 1990). Many research studies have been completed on the BSN level. Studies need to be done on the ADN level and then compared to those at the BSN level to see if predictors for NCLEX-RN success are the same for both groups of students.

A replication of this study should take place with graduates (after May, 1993) who are taking the CAT NCLEX-RN. It would appear that the CAT NCLEX-RN would require a computer comfort level in addition to what is necessary for NCLEX-RN success. A study could determine if the same relationships exist among the independent variables and the dependent variable based on the computer approach to the NCLEX-RN.

A study could also examine the interventions most effective in improving the NCLEX-RN performance of high-risk nursing students. A nursing student may be identified (via

GPA) early in the nursing program as having difficulty mastering the course concepts. Interventions such as remedial English programs, peer tutoring, faculty tutoring, or a senior nursing student mentor program could be examined to determine if any of these may be effective in improving NCLEX-RN performance for any of these nursing students.

Finally, the results of this study should be shared with nursing faculty, advisors, and nursing students. Nursing faculty can identify areas where curriculum needs to be changed in order to promote nursing student NCLEX-RN success. They will also be able to advise nursing students regarding activities that will enhance their success on the NCLEX-RN. The results of this study will assist both the nurse educator and nursing student in working toward attaining the goal of NCLEX-RN success.

It has been documented that the NLN-DRT result has a significant correlation with the NCLEX-RN performance. Based upon this documentation, all nursing students should be required to take the NLN-DRT. The faculty should make this a mandatory test for all nursing students.

The results of this study indicate that the NLN-DRT is more predictive of NCLEX-RN performance than any of the GPAs. The significance of this study for nursing education lies in the fact that the variables serve as important feedback for both nursing faculty and nursing students. Based on NLN-DRT results, nursing faculty can make curriculum changes to strengthen the teaching-learning process to enhance student

learning. The variables can provide feedback for advisement of nursing students. This advisement occurs as the nursing student progresses in his/her nursing education towards the goal of NCLEX-RN success.

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