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## Predictors of Success on the NCLEX-RN Examination

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PREDICTORS OF SUCCESS ON THE NCLEX-RN EXAMINATION

By

Kathleen S. Pangle

A THESIS

Submitted to  
Grand Valley State University  
in partial fulfillment of the requirements for the  
degree of

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## ABSTRACT

This ex post facto study was designed to determine if the scores of advanced standing LPNs' NCLEX-RN scores were significantly different from those of generic students and to identify predictors of success of NCLEX-RN performance. Based on Bandura's theory of self efficacy it was hypothesized that LPNs would score higher on the NCLEX-RN than generic students. The independent variables were final grades in nursing theory courses (Medical-Surgical, Obstetrics, Pediatrics, and Psychiatric Nursing), and NLN Achievement Tests and the Comprehensive Nursing Achievement Test. The study group included 195 graduates from a small, rural Associate Degree in Nursing program between the years 1982-1988. A t-test revealed no significant difference in the NCLEX-RN scores between the two groups in the study. A stepwise multiple regression analysis showed that the NLN tests were highly significant predictors of performance on the NCLEX-RN. Nursing theory course grades indicated only a moderate relationship with the NCLEX-RN. (Index words: Education, nursing, ADN, predicting performance of graduates of; NCLEX-RN, predicting performance on; Self-efficacy).

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## CHAPTER 1

### INTRODUCTION

Schools of nursing are continuously evaluating their programs as well as their graduates. One facet of this process is the evaluation of the success of graduates on the National Council Licensure Examination for Registered Nurses (NCLEX-RN). The change from a curriculum based on the traditional medical model to an integrated nursing model has been one major result of the review process (Melcolm, Venn, & Rausell, 1981). Success on the NCLEX-RN by a major portion of a school's graduating class gives evidence "that the school's curriculum does contain content essential for entry into nursing practice at the minimally competent level" (Breyer, 1984, p. 193).

Recruiting students for schools of nursing requires faculty to develop data, especially positive data, about their programs. Prospective applicants to a school of nursing are concerned about the school's reputation for competency of its graduates. Recruiters often present data of graduates' success on the NCLEX-RN. Schools that can show a consistently high success rate on the examination find it easier to recruit students. This high success rate is important to future graduates, since satisfactory performance on the NCLEX-RN is necessary to obtaining a license to practice nursing (Reed & Feldhusen, 1972).

Admission data, nursing course grades, and National League for Nursing (NLN) Achievement tests have been examined by schools as possible predictors of success on the NCLEX-RN. Many studies (Dell & Haplan, 1984; Felts, 1986; Glick, McClelland, & Yang, 1986; Payne &



Duffey, 1986) show a correlation between academic admission data and the success on NCLEX-RN. The admission data include such variables as high school rank and high school grade point average, individual and composite College Admission Test (ACT) scores, and Scholastic Aptitude Test (SAT) scores. Based on these studies nursing schools can predict which applicants will be successful on the NCLEX-RN. However, because many current nursing school entrants are older than students in the past, care must be exercised in predicting success based on outdated high school scores.

The relationship of theory course grades and the NLN Achievement tests to the NCLEX-RN is of concern to nurse educators. Several studies have analyzed the relationship of these two variables as predictors of the RN licensure examination (Brandt, Hastie, & Schumann, 1966; Baldwin, Mowbray, & Taylor, 1968; Melcolm, Venn, & Bausell, 1981; Crane, Wright, & Michael, 1987; Lengacher & Keller, 1990). These studies indicated that theory course grades and the NLN Achievement tests were predictive of performance on the licensure examination. Yocom and Scherubel (1985) found nursing theory grades useful in predicting performance on state board examinations. These findings indicate that nurse educators can identify, early in their nursing program, students who are likely to be successful on the NCLEX-RN. On the other hand, those students at risk for failure could be identified and could be counseled by faculty.

Licensed practical nurses (LPN) wishing to advance their careers often do so by entering a registered nurse program. An associate degree of nursing (ADN) program may develop its curriculum in a ladder format. This format allows the LPN with recent practical nursing experience to enter the sophomore year and complete the program in one year (Burbach, 1987). During the year these individuals draw from and build on their

prior practical nursing experience (Lengacher & Keller, 1990). Generic students, those who enter an RN program who have not previously earned an LPN title, often have little, if any, practical experience. For generic students, the sophomore year is a time to increase their technical skills, as well as their conceptual knowledge. Based on the concept that current learning is influenced by previous work experience (Chacko & Huba, 1991), should generic students be counseled to exit the ADN program after completion of the practical nursing year? The graduates would work and obtain clinical skills and confidence in themselves as an LPN, re-entering the ADN program after one or more years of work. Gaining self-confidence in one's clinical ability has a direct effect on motivation and the ability to concentrate and prepare for class (Chacko & Huba, 1991). They further indicate the direct effect of these abilities is transferred to one's academic achievement.

Most research studies examining the predictors of NCLEX-RN results have looked at admission data, grade point averages from high school or nursing school, theory course grades, and National League for Nursing (NLN) Achievement or Comprehensive tests. This study was directed toward predicting performance on the NCLEX-RN using the variables of theory course grades and NLN Achievement tests. The purpose of this study was twofold: (1) to determine whether there is any difference in the NCLEX-RN scores of advanced standing licensed practical nurses versus those of generic students; and (2) to compare the relative ability of NLN Achievement Tests and the Comprehensive Nursing Achievement Test versus the nursing theory grades in predicting NCLEX-RN scores achieved by graduates of a particular Associate Degree Nursing program.

## CHAPTER 2

### CONCEPTUAL FRAMEWORK AND REVIEW OF THE LITERATURE

#### Conceptual Framework

This study was based on Bandura's theory of self-efficacy, a theory that states that individuals' motivation toward a goal is influenced by their belief that they have the ability to achieve that goal. Based upon Bandura's idea, it seems reasonable that individuals entering nursing schools with a high sense of self efficacy would be most likely to successfully complete schooling and the licensure examination. If individuals believe in their ability and strength to reach a stated goal, then that belief will motivate or drive them onward.

According to Bandura (1977, 1984), self-efficacy is one's perceived ability to successfully perform a given task in a specific situation which may contain ambiguous, stressful, and unpredictable features. Initiating a task or confronting an unpredictable situation is likely to be determined by the strength of individuals' belief in their own effectiveness (Bandura, 1977). Information about one's level of self-efficacy is obtained from four interrelated sources: self-performances, vicarious (observational or modeling) experiences, verbal persuasion, and psychological (emotional) states (Bandura, 1977; Bandura & Adams, 1977). Bandura notes that "the amount of effort people will expend and how long they will persist in the face of obstacles and aversive experiences" (p. 194) is partly determined by a person's efficacy expectation. Therefore, self-efficacy expectations, as well as motivation, are influenced by success in previous experiences.

One source of information is self-performance. Self-performance influences self-efficacy because it is "based on personal mastery experiences" (Bandura, 1977, p. 195). As efficacy is strengthened by repeated success, the effects of an occasional failure are reduced. In future situations, strengthened efficacy can help master the most difficult obstacles.

Vicarious experience can give people information about their level of self-efficacy. Bandura (1977) believes that seeing others perform activities successfully can persuade observers they can learn to perform the observed activities. If the modeled group is diverse and the behavior has clear outcomes, more efficacy information is conveyed to the observer, thereby increasing the sense of efficacy.

Verbal persuasion, another factor in the sense of efficacy, is frequently used by teachers as a means of influencing human behavior. Through suggestions, rewards, and praise, teachers attempt to convince students they can cope successfully with what has overwhelmed them in the past or what are perceived beyond their ability (Bandura, 1977; Biehler & Snowman, 1990). When based on an actual accomplishment, rewards symbolize progress, increasing one's self-efficacy (Schunk, 1984).

One's self-efficacy is affected also by the physiological state or the amount of emotions generated by the learning task. The higher the anxiety an individual attaches to the learning task the lower the expectation of success (Bandura, 1977). Therefore, as the number of successes increase, situations previously perceived as threatening are less likely to activate anxiety in an individual.

Each factor alone may not increase one's self-efficacy; however, when the factors are combined performance accomplishments may increase.

During the clinical experience students observe staff RNs performing a task and believe they can do the same task. When actually faced with the task the student's level of anxiety may be increased, leading them to question their ability to perform the task. After completion of the task, feedback from the instructor on how well students perform a task strengthens the students' belief in their ability. These feelings of self-efficacy grow stronger with each successful completion of a task, procedure, or semester in the program. When individuals enter the field of nursing for the first time, they do so with the goal of becoming a nurse. These individuals may have little or no experience in this field. However, they enter the nursing program with a belief that they can be academically and technically successful. Because these students have minimal previous experience in nursing, their anxiety level increases when confronted with a new unexpected situation causing their sense of self-efficacy to decrease. In contrast to the first time student of nursing, LPNs enter an RN program with a broad data base and may have a clearer sense of self-efficacy. Through work LPNs are able to complete various tasks, employ problem-solving skills, and receive feedback from RNs. While in the role of a working LPN, an individual may have received praise and encouragement while performing various nursing tasks. This feedback may have helped the LPN to gain success and develop high self-efficacy. LPNs with high self-efficacy would be expected to experience some anxiety when confronted with new unexpected situations, but by drawing on past experience would be able to minimize the amount of anxiety (Chacko & Huba, 1991).

Self-efficacy, according to Bandura (1977), is the conviction that one can successfully do what is necessary to produce a particular outcome. Performance accomplishment is further enhanced by modeling

others. In the work setting, LPNs work with registered nurses observing the RN being successful in many areas. Based on these observations, LPNs may believe they can also achieve success. In addition, as LPNs attempt to perform new tasks or handle difficult situations, they may receive verbal encouragement from RNs to continue with the task. The more encouragement given, the more relaxed and confident the LPN becomes, the greater the chance of success. Furthermore, during work many RNs encourage LPNs to perform new tasks, to accept challenging situations, and to use problem-solving skills. This encouragement, modeling, and success in performing tasks contribute to the development of the LPNs' self-efficacy. As encouragement and reinforcement of behavior continues, the self-efficacy of the LPN will grow stronger. This strong self-efficacy is carried into the nursing program and partly determines the effort the LPN will expend in completing the nursing program. Lent, Brown, and Larkin (1984 & 1987) found that high-self-efficacy individuals achieved higher grades than those with low-self-efficacy. When experienced LPNs are faced with procedures, situations, or tests they have a data base to assist them in handling the situation. This data base helps to maintain the LPN's self-efficacy level.

The LPN entering a nursing program may have self-confidence gained from practical experience, but the generic student has little, if any, practical experience in nursing. As generic students attempt new procedures and tasks and are faced with the need to utilize decision making skills, they have little past experience to rely on. Thus, the generic students are attempting to develop self-efficacy at the same time they are learning new tasks. When encountering the NCLEX-RN the LPNs' self-efficacy levels would likely be stronger than generic students' self-efficacy levels.

The self-efficacy theory can be applied to the classroom and in test taking. If students have confidence in their learning ability, test results will reflect this confidence. Test results are a form of feedback and with each test result student's self-efficacy may be strengthened. The NLN achievement tests are designed to measure a student's achievement in nursing content areas (Garbin, 1988). The achievement tests are written for specific areas of nursing content, e.g.: obstetrics, psychiatry, and care of the adult client. In 1982 the NLN published the Comprehensive Nursing Achievement Test (CNAT) as an assessment tool to predict performance of nursing graduates on the NCLEX-RN (Breyer, 1984). The questions are presented in case situations within a nursing process framework, a format similar to that of the NCLEX-RN (Breyer, 1984; Glick et al., 1986).

As noted above, the NLN Achievement tests and the CNAT can help predict performance on the NCLEX-RN. Melcolm, Venn, and Bausell (1981) suggest the reason for this predictive ability is related to the fact the NLN tests scores and licensure examination scores are standardized paper and pencil measures. The questions on the NLN tests and the CNAT are presented in case situations within a nursing process framework, a format similar to that of the NCLEX-RN (Baldwin, Mowbray, & Taylor, 1968; Wolfe & Bryant, 1978; & Breyer, 1984). Students are given situations and are expected to draw from their knowledge base in selecting the answers (Smeltzer, 1982; Breyer, 1984; & Garbin, 1988). Students who take the NLN achievement tests and consistently do well, receive positive reinforcement for their behavior. This reinforcement strengthens their confidence in test taking. Therefore, when they are confronted with the NCLEX-RN, the graduates may experience lower anxiety and greater confidence in their ability. Because the NLN tests have

shown to be consistent predictors of the NCLEX-RN, they are able to serve as useful diagnostic tools for a student's performance on the licensure examination (Melcolm, Venn, & Bausell, 1981).

### Literature Review

The literature review has been divided into three parts: 1) a review of the literature on NCLEX-RN success for LPN advanced standing students and generic ADN students; 2) a review of the literature on self-efficacy; and 3) a review of the literature regarding the use of NLN tests and theory course grades as predictors of success on NCLEX-RN.

Educational mobility: LPN to RN. The literature was examined for studies which compared LPN advanced standing students versus generic ADN students on NCLEX-RN success. The limited number of studies published examined the validity of admission data (such as age, high school grade point average (GPA), SAT and ACT scores) as predictors of NCLEX-RN success (Felts, 1986; Woodham & Taube, 1986; Lengacher & Keller, 1990). The literature was also reviewed for studies that examined the NLN Achievement tests as predictors of success. Other studies which identified other variables as predictors of NCLEX-RN success were also examined. The literature reported various combinations of variables as predictors of students' performance on the licensure examination. The review found few studies with the NLN tests as predictors of success on NCLEX-RN. Most research had shown a correlation of the NLN tests with the State Board Examination (SBE). Those studies correlating theory course grades to the NCLEX-RN did so only in combination with other variables.

Although there were numerous studies of performance on NCLEX-RN examination, there were few studies examining specifically the



performance of LPNs returning to a registered nurse program. The studies by Felts (1986) and Burbach (1987) separate the LPNs from generic students when seeking variables predictive of success on the NCLEX-RN.

The following questions have not been fully addressed by the present literature:

1) Based on the past experience LPNs have had with taking a licensure examination, working, and previous college courses, would the LPN be more competitive, have a higher self confidence than generic students?

2) Would the NCLEX-RN scores of an LPN differ significantly from generic students?

In a study of graduates from five associate degree nursing programs (n=297), Felts (1986) noted that those entering the program as licensed practical nurses do not score significantly different on the NCLEX-RN ( $\chi^2_{(1)}=0.655$ ,  $p>.05$ ) than non-LPN graduates. These findings were supported by Burbach (1987). For the period 1982-1984, Burbach found no significant difference between LPN graduates (n= 65) and the generic graduates (n=62) on the NCLEX-RN ( $F=.0137$ ).

Self-efficacy. Although nursing literature is limited in addressing this area, Bandura's (1977) theory of self-efficacy has been tested in other academic areas. Since the introduction of self-efficacy theory in 1977, it has been studied in relation to a variety of clinical problems. Researchers have also extended self-efficacy theory to career and academic behavior. Betz and Hackett (1981) studied 235 college women (n=134) and men (n=101) and their perceptions of their abilities to successfully complete the educational requirements and job duties of 10 traditional (traditionally chosen by females) and 10 nontraditional

(traditionally chosen by males) occupations. It was discovered that the differences in self-efficacy between the sexes played an important part in selecting a traditionally female occupation. The authors found males to perceive themselves capable of successfully completing educational requirements for an average of 6.9 of the 10 traditional female and 6.9 of the 10 nontraditional female occupations. On the other hand, females perceived their capabilities for successfully completing educational requirements for traditional occupations an average of 8, but only 5.7 for nontraditional occupations. In rating their perception on successfully performing job duties related to the occupations, males perceived themselves capable of 7 female traditional and 7.2 female nontraditional occupations; where as females perceived themselves capable of 8 traditional but only 6 nontraditional occupations. In general, the data from this study suggest that expectations of personal efficacy and interest are related and are strong predictors of career options pursued and those avoided.

The study conducted by Lent, Brown, and Larkin (1984), was designed as an extension of the Betz and Hackett (1981) study. Lent, Brown, and Larkin (1984) investigated the relation of self-efficacy beliefs and persistence to academic success of students (n=42) considering science and engineering careers. Analysis of the data revealed that students with high level and strength of self-efficacy in successfully completing educational requirements and job duties generally received higher grades and remained longer in technical careers than did the low-self-efficacy groups. Chi square tests revealed that high-level and high-strength self-efficacy groups are more persistent for four quarters of academic study than low-level and low-strength groups. The authors of this study caution that the findings need to be replicated with a larger sample.

In 1986 Lent, Brown, and Larkin extended their 1984 study to a larger sample ( $n=105$ ) for the purpose of exploring the relationship of self-efficacy beliefs to educational/vocational choice assessing to what extent self-efficacy beliefs predict academic grades and retention. The student data was further divided into high- and low-self-efficacy groups. The groups were compared one year later on two academic outcomes, (1) grade point average in science and technical course work and (2) number of quarters completed as a student in the college of technology (Lent, Brown, & Larkin, 1986). For both outcomes differences were demonstrated between high and low groups. Technical course GPA for the high-self-efficacy group revealed a mean of 2.80,  $SD=0.47$ , whereas the low-self-efficacy group mean was 2.43,  $SD=0.83$ . A  $t$  test of the data revealed these differences to be significant ( $t=1.97$ ,  $p<.05$ ).  $T$ -test results revealed that students with high-self-efficacy achieved higher grades than the low self-efficacy students ( $t=2.35$ ,  $p<.05$ ). Further analysis of the data, using a hierarchical regression analysis, revealed self-efficacy contributes significantly to predicting technical course grades ( $R^2=.42$ ,  $p<.05$ ). This study supported the utility of self-efficacy in predicting grades and perceived career options.

Although Bandura and his colleagues have shown the usefulness of self-efficacy expectations in the treatment of several clinical problems, later research indicates the applicability of self-efficacy expectations to vocational behavior (Betz & Hackett, 1981). The current literature suggests that self-efficacy influences one's task choice, level of performance, and effort expended on a task. Feedback given to individuals about their performance strengthens their self-efficacy expectations. In subsequent situations individuals draw from these self-efficacy expectations to estimate their current behavioral

abilities (Meier, McCarthy, & Schmeck, 1984). According to the self-efficacy theory, students who have high expectations or beliefs will be motivated to do well when the NLN Achievement and the Comprehensive Nursing Achievement tests are administered. The results from the NLN tests are a form of feedback and when positive results are obtained success is reinforced and self-efficacy is strengthened. Students with high self-efficacy expectations generally achieved higher grades and tended to be more persistent in technical majors than those with lower self-efficacy (Lent, Brown, & Larkin, 1986).

Predictor variables. Nursing educators must periodically examine each nursing course for its contribution to the level of success of their graduates. From this examination the courses may be revised to increase the level of success. To this end many studies have been conducted over the years. Felts (1986) and Lengacher and Keller (1990) looked at admission variables, as well as theory course grades, as predictors of success. The NLN tests were also included in the Lengacher and Keller (1990) study. The findings of these studies identified no consistent predictor variable.

The studies correlating predictor variables to success on the licensure examination can be divided into three groups: 1) predictors based on admission data; 2) theory course grades in combination with other predictors; and 3) theory course grades, NLN test, as well as, other predictors.

Felts (1986) studied the predictive validity of admissions data and data collected at the end of an ADN program and made two significant findings. First, ACT composite scores were significant predictors ( $F=35.867$ ;  $p<.001$ ) of GPA in nursing courses. This F score ( $n=99$ ) accounted for 27% of the variance in the nursing courses GPA. Second,

college course grades and the cumulative GPA were predictors ( $R^2 = .46$ ,  $p < .001$ ) of success on the NCLEX-RN. Studies in ADN programs (Reed & Feldhusen, 1972; Woodham & Taube, 1986) and in BSN programs (Sharp, 1984; Whitley & Chadwick, 1986) reported that admission data and data collected near the end of the nursing program were positive predictors of success on the NCLEX-RN.

Glick, McClelland, and Yang (1986) investigated the use of admission data as predictors of success in an integrated BSN program on the NCLEX-RN. Predictor variables included high school rank and GPA, ACT scores, and cumulative GPA for chemistry, biological sciences, social sciences, and grades in all prenursing courses. Nursing theory course grades, clinical nursing course grades, and NCLEX-RN scores were used as outcome criteria. Clinical nursing course grades were not statistically significant predictors of performance on the NCLEX-RN. Nursing II theory course made a significant correlation ( $R^2 = .32$ ,  $p < .001$ ) to the NCLEX-RN over other nursing courses.

Krupa, Quick, and Whitley (1988) studied a BSN program ( $n=213$ ) to determine if grades from required nursing courses could predict performance on the NCLEX-RN. Discriminant function analysis of grades from selected nursing theory and practicum courses required for graduation revealed that grades in all theory courses were substantially related to NCLEX-RN performance, but practicum grades had a weaker relationship to NCLEX-RN performance. Their findings also revealed 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 (structure coefficient .76), taken at the beginning of the sophomore year. The emphasis of the course was the study of the nursing process, which is emphasized

throughout the NCLEX-RN. The second best predictor was the Medical-Surgical II theory course (structure coefficient .64) taken during the junior year. It is at this time that students build on their theoretical knowledge and apply the nursing process during patient care. Medical-Surgical I theory course (structure coefficient .61) also showed a high correlation with the NCLEX-RN. The least reliable predictors of success were clinical courses Medical-Surgical I practicum (structure coefficient .24), Community Mental Health practicum (structure coefficient .19), and Medical-Surgical II practicum (structure coefficient .16).

Students who are nearing the completion of their nursing education are most concerned about passing the NCLEX-RN. Several researchers have attempted to identify components of a nursing program that would predict success on the NCLEX-RN. These predictors can be used to make the student aware of weaknesses that necessitate extra study or review before attempting the NCLEX-RN (Baldwin, Mowbray, & Taylor, 1968). Brandt, Hastie, and Schumann (1966), in a five-year study in a BSN program, found that nursing theory and clinical grades, and NLN Achievement Tests scores were useful in predicting performance on State Board Examinations (SBE). However, when Baldwin, Mowbray, and Taylor (1968) examined the relationship between theory grades and NLN Achievement Examination scores in a diploma program, they found the NLN scores to be better predictors of success on the SBE than the nursing theory grades.

In a study of an integrated baccalaureate curriculum, Melcolm, Venn, and Bausell (1981) utilized a number of predictors identified in previous studies. Though a baccalaureate program is theoretically different from diploma and associate nursing programs, the results were

consistent with those reported in previous studies. The final analysis indicated that the best predictors were the NLN scores (mean  $r=.53$ ,  $p<.05$ ), followed by theory grades (mean  $r=.46$ ,  $p<.05$ ), graduating GPA (mean  $r=.42$ ,  $p<.05$ ), admitting GPA (mean  $r=.37$ ,  $p<.05$ ), and clinical grades (mean  $r=.20$ ,  $p<.05$ ).

A general review of the literature indicates that NLN Achievement Tests, nursing theory courses GPA, and academic GPA can be useful predictors of NCLEX-RN performance. On the other hand, grades from clinical nursing courses have not been reliable predictors of NCLEX-RN performance. The information obtained from these studies is based on nursing programs with low failure rates. These findings need to be tested in programs with higher failure rates. The literature does not indicate if low failure rates are due more to the quality of teaching or the curricular format of the nursing program.

Clinical grades should be used with caution as predictors of NCLEX-RN performance. Brandt, Hastie, and Schumann (1966) clearly show the mean GPA for clinical courses tends to be higher than the GPA for nursing theory courses. Krupa, Quick, and Whitley (1988) also indicate this dichotomy between nursing clinical and theory grades. They suggest the lack of a uniform, criterion-based method of evaluating students in the clinical setting contributes to clinical grades being poor predictors of NCLEX-RN performance. One must also consider faculty bias when reviewing clinical grades.

In conclusion, the literature identified a small number of studies using data from ADN programs for predicting success on NCLEX-RN. Many authors have examined data from BSN graduates. This data primarily correlated admission predictor variables to success on the NCLEX-RN.

The admission predictor variables tend to include such items as SAT and Act scores, high school rank and GPA, and age.

Studies examining the correlation of the nursing theory course grades and NLN tests to the NCLEX-RN test were lacking in the literature review. Several studies were found correlating the NLN tests with the SBE. The focus and format of the SBE is different than the NCLEX-RN, limiting the generalizability of those studies to the current NCLEX-RN examination.

### Hypothesis

Based on the stated purposes and the review of the literature, the following hypotheses were formed:

1. Advanced standing LPN students' NCLEX-RN scores would differ significantly from the scores of generic students.
2. The NLN Achievement Tests and the Comprehensive Nursing Achievement Tests will account for a greater proportion of the variance in NCLEX-RN examination scores than nursing theory course grades.

### Definitions

For the purpose of this study the following terms and abbreviations are defined:

#### Dependent Variable:

-- National Council Licensure Examination for Registered Nurses (NCLEX-RN): This criterion referenced examination is an integrated licensure examination organized in a nursing process format. The score is reported as a single total score with a cut off score for passing of 1600 out of a possible score of 3200. The graduate must pass this test in order to be licensed to practice as a registered nurse. This examination replaced the State Board Examination (SBE) in 1982. In this



study scores from this examination (NCLEX-RN) represent the dependent variable.

Independent Variables:

- Generic Student (G): The generic student is that individual who enters the nursing program at the beginning of the program and continues through to the completion of the second year in an ADN program.
- Advanced Standing LPN Student (AS): This student is a LPN who has been out of nursing school at least one year and elects to re-enter nursing education at the beginning of the second year of an ADN program.
- National League for Nursing (NLN) Achievement Tests: Nationally standardized tests designed to measure individual achievement in nursing content areas. Objectives, course or program, can be evaluated by facilities with nationally accepted objectives in nursing. The students' scores are compared with those of students throughout the country. Each test has separate norms for students in associate degree, diploma, and baccalaureate programs (NLN Testing, 1988). The NLN Achievement tests included in this study are Nursing Care of Adults I, Maternity and Child Nursing, and Psychiatric Nursing.
- National League for Nursing Comprehensive Nursing Achievement Test: This standardized test was first available in 1982 and is based on the NCLEX-RN test plan. The test is inclusive of nursing knowledge and skills needed for entry-level into practice as an registered nurse. A test score above 160 indicates to the individual a 75 percent likelihood of passing the NCLEX-RN.
- Nursing Theory Grades: Nursing theory comprises those nursing courses taught only in the classroom, excluding the practical experience. The theory courses are considered the basis for the

students' nursing education. The grade is a computation of what the student has earned on tests given throughout the course.

A list of the courses investigated in this study and a brief description of each follows. The courses selected for the study consisted of nursing theory courses only.

-- Pediatric Nursing (Peds): Meeting the needs relative to the care of the child through adolescence is the focus of this course. The dynamics of family interaction on the development of this population are interwoven in this course.

-- Maternity Nursing (OB): The focus of this course is on family needs as they relate to prenatal, prepartal, intrapartal, and postpartal care. Emphasis is placed on the assessment of individuals, as well as families.

-- Psychiatric Nursing (Psy): This course enables the student to better understand his/her behavior, ways in which one can establish and maintain a therapeutic environment, and means of improving one's communication skills. Course content examines various personality developmental theories, developmental disabilities, and associated treatments. This content is applied to selected diagnoses.

-- Medical-Surgical Nursing II and III (MSII and MSIII): Both theory courses study the needs and care of medical and surgical patients of all ages with acute and chronic diseases. Emphasis is placed on assessment and teaching skills.

## CHAPTER 3

### METHODOLOGY

#### Research Design

This ex post facto correlation study reviewed the records of the graduates of an Associate Degree of Nursing (ADN) program for the years 1982-1988. The study was undertaken to determine if (1) the NCLEX-RN scores of advanced standing licensed practical nurses differ from those of generic students and (2) to determine the effectiveness of nursing course grades, NLN Achievement Tests and Comprehensive Nursing Achievement Tests (CNAT) as predictors of performance on the NCLEX-RN.

#### Sample and Setting

The sample for this study consisted of students from an ADN program graduating between the years of 1982-1988 and sat for the NCLEX-RN that same year. The sample was comprised of 195 graduates, 87 generic students and 108 advanced standing LPNs. During the seven year span there were no major changes in either the curriculum or faculty, and the content of the identified nursing theory courses was delivered by the same team of nursing faculty. The NLN Achievement tests are scheduled after specific nursing theory courses. Students of the ADN program are encouraged to take the NLN test; however, taking the NLN tests is not mandatory and some students elect not to participate in the testing. It was therefore decided that where NLN data were missing from the records those students would be excluded from various statistical procedures. Graduates who successfully completed the program were eligible to take the NCLEX-RN. The limitation of the sample to the seven-year time span

is related to changes in the licensure examination and the reporting of NCLEX-RN scores. Prior to 1982, the State Board Examinations (SBE) reported score results in five subscores and required a passing score of 350 in each subscore. The NCLEX-RN, implemented in 1982, reported score results as one integrated score (Whitley & Chadwick, 1986). In 1988 the NCLEX-RN process changed from a specific score to pass/fail. The sample is further limited to those graduates taking the examination for the first time. There was no attempt to identify how long the graduate had spent in the program before completion of the ADN program. Two groups, generic and advanced standing LPNs, are identified for the purpose of comparing performance of each group on the NCLEX-RN. The class of 1982 was excluded from this comparison as it included only LPN students.

Program Description. The Associate Degree of Nursing (ADN) program in the study was established in the fall of 1981 and is located in the rural midwest. It is a two year ladder program that allows students to leave after successful completion of the first year to take the licensing 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 degree of Associate of Applied Arts and Sciences is awarded and the graduate is eligible to take the NCLEX-RN.

#### Instrument

Data was collected on a master sheet similar to that developed by Brandt, Hastie, and Schumann (1966). The final grades, in percent, for the nursing theory courses of Medical-Surgical Nursing, Maternity Nursing, Pediatric Nursing, and Mental Health Nursing were recorded along with the corresponding scores on NLN Achievement tests and the COMP score. The final entry was the scores from the NCLEX-RN.

### Procedure

The grading scale used by the ADN program for nursing courses is: 93-100% = A, 85-92% = B, 75-84% = C. These percentages are reported to the Records Office as 4 = A, 3 = B, 2 = C. Any course grade below 75%, or 2, is considered as not passing and that course must be repeated to receive credit necessary for graduation. Where records indicate a repetition of a course, the original grade was used. A repeated score might have a sensitizing effect on the student's performance.

This ex post facto research study was exempt from Human Subject Review as information from educational testing was being used. Data obtained from files was recorded in such a manner that identification of individual subjects could not be made. To maintain anonymity of the subjects, all identifying information was removed from the records by the admission office personnel prior to data collection. Files of students with missing data were excluded from the study. Each student was coded either as generic or advanced standing LPN.

## CHAPTER 4

### DATA PRESENTATION AND ANALYSIS

The purposes of this study were (1) to determine whether there is any difference in NCLEX-RN scores of advanced standing licensed practical nurses (LPN) versus those of generic students; and (2) to compare the relative ability of NLN Achievement Tests and the Comprehensive Nursing Achievement Test versus the nursing theory grades in predicting NCLEX-RN scores achieved by graduates of a particular Associate Degree Nursing (ADN) program. This study examined whether the status (LPN vs. generic) of the graduates made a difference in the NCLEX-RN results. Twelve additional predictor variables and their interrelationships were examined.

Specifically the two hypothesis tested were as follows:

1. Advanced standing LPN students NCLEX-RN scores would differ significantly from the scores of generic students.
  2. The NLN Achievement Tests and the Comprehensive Nursing Achievement Test would account for a greater proportion of the variance in NCLEX-RN examination scores than nursing theory course grades.
- Data from the seven years included in this study were analyzed together, followed by analysis of each year independently. Finally, the data were examined in the order of the hypotheses listed.

Table 1 summarizes the NCLEX-RN means, standard deviation, minimum and maximum for each year of this study. Included in this table are the number of students per year. As can be seen the mean scores on the nationally administered examination, NCLEX-RN, were 400-700 points above

the minimal passing score of 1600, with 3200 being a perfect score. Standard deviations for the different years were approximately the same. Students in four of the seven years had a minimum score falling below the 1600 score required to pass the examination; however, this represented only 6 out 195 students over the seven years. Further inspection of the mean, minimum, and the maximum scores on the examination indicated no directional trend with time.

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Table 1

NCLEX-RN Means, Standard Deviations, Minimums, & Maximums For

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Each Year (n=195)

Year	n	Mean	STD	Minimum	Maximum
1982	23	2136	262	1457	2435
1983	26	2141	280	1674	2685
1984	27	2007	279	1317	2543
1985	25	2326	246	1933	2766
1986	37	2196	226	1691	2569
1987	29	2209	343	1523	2969
1988	28	2064	309	1261	2629
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Averages		2155	277	1551	2657

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A one-way analysis of variance (ANOVA) was performed to determine whether any of the groups differed significantly from the others. The year was the independent variable with the NCLEX-RN scores as the dependent variable. The results of this analysis are shown in Table 2. With 6 and 189 df, an F of 3.36 was significant at the .01 level.

Table 2

## Summary of Analysis of Variance For NCLEX-RN Scores

Source of Variance	SS	df	MS	F	p
Between groups	2,217,045	6	369,507	3.36	<.01
Within groups	20,733,072	189	109,698		

After a significant F value was found, a Scheffe test was run to identify where the significant differences were between the groups. When compared, the values at the .05 level were not significant. Thus, the seven groups in the comparison were not significantly different from each other. Based on the results of the Scheffe test data from the seven classes were combined in subsequent analysis.

Table 3

Correlation<sup>a</sup> of Nursing Theory Courses and NLN Achievement Tests with NCLEX-RN Scores for Years 1982-1988 (n=156)\*

	OB	OB	Peds	Peds	Psy	Psy	MSII
		NLN		NLN		NLN	
OBNLN	.55						
Peds	.76	.52					
PedsNLN	.38	.46	.42				
MHC	.66	.59	.73	.41			
PsyNLN	.28	.40	.37	.39	.38		
MSII	.61	.57	.64	.39	.71	.38	
NCLEX-RN	.78	.61	.43	.47	.63	.47	.67

<sup>a</sup>All correlations were significant at  $p < .01$ .

\*Subsample which had complete data on all tests.



To further analyze the data, a Pearson's correlation and stepwise multiple regression were utilized. The simple correlation (Pearson's  $r$ ) for the 1982-1988 combined classes ( $n=156$ ) is reported in Table 3. The OB theory course demonstrated the strongest relationship of all the independent variables with the dependent variable NCLEX-RN ( $r=.78$ ,  $df=154$ ,  $p<.01$ ). This was closely followed by the relationship of the MSII theory course ( $r=.67$ ) and the Psy ( $r=.63$ ) with the NCLEX-RN. All of the independent variables demonstrated a high degree of positive correlation with each other. The interrelatedness demonstrated suggests

Table 4

Correlation<sup>a</sup> of Nursing Theory Courses and NLN Achievement Tests with  
NCLEX-RN Scores for Years 1985-1987 ( $n=80$ )<sup>\*</sup>

	OB	OB	Peds	Peds	Psy	Psy	MSII	MSIII	MS	COMP
	NLN		NLN		NLN			NLN		
OBNLN	.60									
Peds	.69	.37								
PedsNLN	.46	.40	.38							
MHC	.70	.51	.74	.48						
PsyNLN	.52	.43	.50	.41	.58					
MSII	.74	.47	.68	.32	.65	.42				
MSIII	.69	.44	.64	.33	.63	.56	.79			
MSNLN	.46	.50	.39	.35	.58	.53	.44	.43		
COMP	.43	.48	.28	.41	.46	.55	.33	.37	.65	
NCLEX-RN	.59	.55	.44	.43	.67	.48	.54	.49	.66	.62

<sup>a</sup>Subsample which had complete data on all tests.

<sup>\*</sup>All correlations were significant at  $p<.05$ .

a great deal of consistency in the nursing curriculum; students who score well in one area tend to do well in other areas.

The combined years of 1985-1987 (Table 4) in which data was available for the independent variables MSIII, MSNLN, and the NLN Achievement Comprehensive (COMP) test, were analyzed using Pearson's  $r$  correlation. These combined years are the most complete, in that the data included all of the independent variables for this study. The strongest correlates of the NCLEX-RN were Psychiatric theory course ( $r=.67$ ,  $p<.05$ ) and Medical-Surgical NLN ( $r=.66$ ,  $p<.05$ ). As discussed above, these independent variables continue to show a large degree of positive correlation suggesting consistency in the nursing curriculum.

Table 5 shows the correlation results of the independent variables on a yearly basis. While some variation was present, the results tended to be consistent from one year to the next. In 1984 the NLN COMP was

Table 5

Pearson's Correlations of Independent Variables with NCLEX-RN by Year

Year	OB	OB	Peds	Peds	Psy	Psy	MSII	MSIII	MSNLN	COMP
		NLN		NLN		NLN				
1982	.77	.87	.70	.59	.78	.59	.80	NA <sup>a</sup>	.64	NA
1983	.46	.43	.22	.54	.21	.62	.74	NA	.87	NA
1984	.32	.88	.69	.54	.57	.67	.71	NA	.62	.85
1985	.78	.50	.73	.64	.66	.34	.66	.52	.79	.80
1986	.52	.47	.47	.18	.63	.59	.65	.60	.67	.54
1987	.57	.66	.33	.50	.72	.46	.75	.58	.57	.60
1988	.80	.66	.77	.34	.77	.40	.81	.77	NA	.87

<sup>a</sup>NA=not available as test was not offered to students this year.

incorporated into the program. The COMP for the years 1984, 1985, and 1988 demonstrated an especially strong positive correlation with the NCLEX-RN ( $r=.85$ ,  $.80$ , and  $.87$  respectively).

#### Hypothesis 1

Advanced standing LPN (AS) students' NCLEX-RN scores would differ significantly from generic (G) students.

The students' data was divided into two groups, advanced standing LPNs and generic students. The number of cases, the mean, standard deviation, minimum and maximum scores of each group are indicated in Table 6. The 1982 class was the first year of the ADN program with enrollment limited to licensed practical nurses; therefore, this class was eliminated from the comparison. To determine if the NCLEX-RN scores would differ significantly between the groups, a one tailed t-test was used. The t value (.11) was not significant at the .05 level. Therefore hypothesis 1 was rejected.

Several points can be identified from Table 6. The mean scores and the standard deviations indicated a marginal difference for the 6 years. Advanced standing LPNs had higher mean scores 5 of the 6 years. The minimum and maximum scores of generic students were higher than the scores of advanced standing LPNs 4 of the 6 years. The widest range of minimum scores between the two groups was in 1987 and 1988. The last four years of the study indicate the generic students' maximum scores were slightly higher than the advanced standing LPNs'. Further, the maximum scores revealed both groups were at least 800 points above the minimum passing score of 1600.

Table 6

Analysis of NCLEX-RN Scores for Generic(G) and Advanced Standing (AS)LPN Students for 1983-1988

Year	Number		Mean		STD		Minimum		Maximum	
	AS	G	AS	G	AS	G	AS	G	AS	G
1983	14	12	2200	2074	307	242	1674	1725	2685	2563
1984	14	12	2044	2024	261	244	1549	1580	2543	2411
1985	8	17	2334	2322	277	238	1933	1976	2632	2766
1986	13	24	2205	2191	240	224	1691	1759	2549	2569
1987	17	13	2199	2215	276	417	1840	1523	2846	2969
1988	14	11	2175	1991	263	349	1756	1261	2586	2629

Hypothesis 2

The NLN Achievement Tests and the Comprehensive Nursing Achievement Tests will be more predictive of success of ADN graduates on the NCLEX-RN examination than nursing theory course grades.

The coefficients obtained from the Pearson's r indicated a strong positive correlation between the independent variables and the dependent variable. Because there was no one independent variable that was consistently more predictive than another, the data was further subjected to a stepwise regression analysis. For this analysis, only the test results of those students with complete data were used. The graduates eliminated generally had one or more missing NLN test scores.

The independent variables, theory course grades and the NLN Achievement Tests, were subjected to the stepwise multiple regression analysis for each year. The number of cases per year varied based on the number of students per year and the number of cases eliminated due to missing data. Table 7 shows a summary of the results of the

analysis. With the exception of 1987, the strongest predictor of NCLEX-RN scores was an NLN Achievement test. The class of 1982 had several cases with missing data. After the cases with missing data were eliminated 8 cases remained for analysis. Because of the small population in the class of 1983, the class was analyzed in two groups. The first group consisted of the independent variables of nursing theory courses (n=26) and the second group were the NLN tests (n=8).

Table 8 shows the result of a stepwise multiple regression analysis using NCLEX-RN as the dependent variable. The analysis combined the years of 1984-1988. Ten independent variables were analyzed. They included years, status, OB, OBNLN, Peds, PedsNLN, Psy, PsyNLN, MSII and COMP. In the analysis the independent variables were entered into the equation by the computer program in order of importance. The initial variable entered into the stepwise multiple regression analysis was the COMP test, as shown in Table 8. This variable was significant at the  $p < .001$  level. The equation had a multiple  $R^2$  of .50, indicating that 50% of the variance in NCLEX-RN scores was explained by the COMP test. This is consistent with the above correlation tables. As the other variables of MSII theory, Psy, and Peds theory were entered into the multiple regression analysis, the percent explained increased to 66. The resulting equation was:

$$\text{NCLEX-RN} = -2039 + 6.8(\text{COMP}) + 21.6(\text{MSII}) + 25.5(\text{Psy}) - 14.5(\text{Peds})$$

As a result of the positive correlation between the independent variables, the addition of each variable caused the coefficients to be changed.

Table 7

Stepwise Multiple Regression Analysis of Each Class for Predictors<sup>a</sup> ofNCLEX-RN

Year	n	Variable	R <sup>2</sup>	t	p
		Entered			
1982	20	OBNLN	.76	7.53	<.001
		OB	.89	2.12	<.05
1983	8/26 <sup>b</sup>	MSNLN	.75	4.25	<.01
		OBNLN	.98	7.54	<.001
		PedsNLN	.99	2.39	<.05
1984	23	OBNLN	.78	8.56	<.001
		Comp	.85	3.26	<.01
1985	25	Comp	.65	6.48	<.001
		OB	.80	4.13	<.01
		MSNLN	.84	3.77	<.01
1986	28	MSNLN	.45	4.58	<.01
		MSII	.66	3.97	<.01
1987	27	MSII	.56	5.60	<.01
		Psy	.60	1.60	<.05
		Peds	.70	2.76	<.05
1988	25	Comp	.76	8.44	<.001
		Psy	.78	1.63	<.05

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<sup>a</sup>NLN COMP not included in analysis for classes 1982-1983.

<sup>b</sup>Only 8 of 26 students took all NLN tests offered.

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Table 8

## Stepwise Multiple Regression Analysis of Combined Classes for

Predictors<sup>a</sup> of NCLEX-RN

Group	Number	Variable	R <sup>2</sup>	t	p
	Cases	Entered			
1984-1988	128	COMP	.50	11.18	<.001
		MSII	.61	6.11	<.01
		Psy	.64	2.72	<.01
		Peds	.66	2.97	<.01

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<sup>a</sup>Independent Variables included: years, status (AS and G), OB, OBNLN, Peds, PedsNLN, Psy, PsyNLN, MSII, COMP.

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The Pearson's r correlation and the stepwise multiple regression analysis indicate the NLN Achievement tests tended to be more predictive of success on the NCLEX-RN than did nursing theory course grades.

## Chapter 5

### SUMMARY, LIMITATIONS, DISCUSSION, AND RECOMMENDATIONS

#### Summary

The dual purpose of this research study was (1) to identify whether there were any differences in the NCLEX-RN scores of advanced standing licensed practical nurses (LPN) versus those of generic students; and (2) to compare the relative ability of NLN Achievement Tests and the Comprehensive Nursing Achievement Test versus the nursing theory grades in predicting NCLEX-RN scores. The study included 212 students enrolled in an Associate Degree of Nursing (ADN) program for the years 1981-1987.

From the total of 212 admitted to the program, 195 had complete data files. All graduates included in the study completed the program requirements, graduated and sat for the licensure examination. Only six failed the NCLEX-RN on the first attempt for licensure. The total 195 cases averaged approximately 2155 on the test, with a standard deviation of approximately 290. Compared to the minimum passing score of 1600, there was a marked difference between the minimum score and the score achieved by the graduates.

Graduates of the program demonstrated minimal difficulty in their performance on the licensure examination. When the graduates were separated into two groups, advanced standing LPNs and generic students, there was no significant difference between the groups NCLEX-RN scores.

The 12 predictor variables were subjected to calculation of Pearson's  $r$  correlation coefficient and to stepwise multiple regression. The results indicated a multitude of significant correlations between



the NLN Achievement tests and the dependent variable, NCLEX-RN. Overall, the NLN Comprehensive test was the most significant predictor of NCLEX-RN success (Table 8, p. 32). The strength of the relationship of nursing theory course grades as predictors of success on the NCLEX-RN was moderate.

### Limitations

The following limitations affect the generalizability of the findings and must be considered before conclusions can be drawn from this study. First, the nature of the study does not lend itself to random sampling. Students are admitted to the first year (LPN) based on fixed entrance requirements. The individuals then decide to continue into the program's second year (ADN) based on their personal set of circumstances. Second, the graduates of this study are from a community college in a rural farm area. Finally, ADN educators studying these results must be aware that the results are based on students from only one institution. Hence, generalizations to other institutions must be made with caution.

### Discussion

Although self-efficacy was not measured in this study, it was believed that advanced standing LPNs would do better than generic students on the NCLEX-RN test. It was felt that the advanced standing LPNs would have a stronger self-efficacy base as a result of previous clinical experience. Therefore, when faced with various situations and procedures these students would draw from their past experience and complete the procedures with less anxiety and stress than generic students. As the advanced standing LPNs continued in the program, their self-efficacy would increase, increasing their self confidence. This increased self confidence would also be transferred when taking the

NCLEX-RN test. However, the data revealed that the independent variable of status, advanced standing LPNs vs. generic student, made no difference in the success on the NCLEX-RN. This supports the similar findings of Burbach (1987) and Yess (1980). Yess (1980) believed that the status of advanced LPN standing gave no extra advantage because depth in knowledge and detailed information was not required in most LPN programs.

This ex post facto study investigated the correlation of 12 independent variables and one dependent variable. It is recognized that other variables not included in this study might have resulted in a somewhat different set of findings. Those independent variables included were chosen because of documented success as predictors in previous studies. The study revealed strong correlations between the NLN Achievement Tests and the NLN Comprehensive Test and the dependent variable (NCLEX-RN). As indicated in Table 9, performance on the NLN tests was more predictive of success on the NCLEX-RN than were grades in

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Table 9

Comparison by Year of Rankings of Top Three NCLEX-RN Correlates

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Year	First	Second	Third
1982	OBNLN	MSII	Psy
1983	MSNLN	MSII	PsyNLN
1984	OBNLN	COMP	MSII
1985	COMP	MSNLN	OB
1986	MSNLN	MSII	Psy
1987	MSII	Psy	OBNLN
1988	COMP	MSII	OB

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in the nursing theory courses. The original hypothesis of the study was that the NLN tests would be more predictive of success of ADN graduates on the NCLEX-RN examination than nursing theory course grades. This hypothesis was based on the following assumptions: 1) The NLN tests are nationally standardized tests, more closely paralleling the NCLEX-RN. 2) Nursing theory course grades are the average of instructor developed tests and are, therefore, less related to the NCLEX-RN.

Data analysis consistently indicated that graduates excelled on the licensure examination above what is required for passing. A multiple regression analysis (Table 8, p. 33) indicates that over 50% of the total variance in NCLEX-RN scores could be accounted for by the independent variables. Table 1 (p. 25), showing the minimum and maximum scores of the NCLEX-RN, also indicates high performance of the graduates. To assist in explaining this performance other factors must be considered. First, the class sizes were small, which allowed faculty to give students close counseling and individual attention. This attention allowed weaker students to be tutored, lowering, to zero, attrition from the program and raising the student's chances to pass the licensure examination.

Secondly, entry into the program was controlled by moderately stringent admission criteria, and students were required to maintain a 75% average (GPA 2.0) in all nursing courses. However, there was no minimum score or percent to achieve on the NLN tests. While taking the NLN tests is not mandatory in this program, the data from this study supports the recommendation by faculty for students to take the tests. Of the 195 graduates under study, 80 percent elected to take the NLN tests. Based on Bandura's theory of self-efficacy (1977), the similarity of the NLN tests with the NCLEX-RN reinforced the graduates'

belief in their test taking ability. Self-efficacy is the effort an individual would employ and how long they would persist to produce a particular outcome (Biehler & Snowman, 1990). The amount of reinforcement and feedback the individual receives would influence the effort employed, "which enhances motivation, which contributes to current achievement" (Biehler & Snowman, 1990, p. 572). Therefore, the more effort put forth the greater the rewards, increasing one's self-efficacy. If NLN tests results are seen as a means to an end, i.e., success on the NCLEX-RN examination, then the greater the effort to learn and apply information obtained from nursing theory courses (Chacko & Huba, 1991). It was not the intent of this study to measure the self-efficacy of the students; however, further study of the interaction of self-confidence and motivation on obtaining grades is warranted. These factors may help explain why all students completed the program and only 6 students out of 195 failed the licensure examination on the first attempt.

### Recommendations

Several recommendations for further research based on the results of this study are identified. First, replication of this study using a larger sample of ADN graduates should be undertaken. Larger samples might identify what influence faculty's tutorial and one-on-one assistance have on student performance. Second, an extension of this study should be designed to include additional variables. Such variables might include science courses, age, motivational and personality traits. Other combinations of variables might be shown to be significant predictors of NCLEX-RN performance. Third, a study should examine if the independent variables of this study are predictive of baccalaureate graduates' success on the NCLEX-RN. In such a study the

age variable might be included rather than status. Other non-nursing variables, such as motivational traits and identification of self-efficacy, might indicate significant relationships. Fourth, an area to investigate would be those students who elect to complete all non-nursing academic courses (science courses, English, humanities, government, psychology) prior to entry into the nursing program versus those students who must take both non-nursing academic and nursing courses. By completing non-nursing academic courses ahead of time, students would be able to concentrate on nursing courses. Finally, the results of this study should be shared with faculty and advisors of marginal nursing students. This might encourage marginal students to enroll in a study strategy course to help ensure success on the NCLEX-RN examination (Chacko & Huba, 1991; Fowles, 1992).

The results of this study demonstrate that there is no significant advantage for an LPN over a generic student in terms of achievement on the NCLEX-RN. The results of this study do not indicate the necessity for nursing faculty to counsel generic students to exit the program after completion of the first year. This study also indicates that the NLN Achievement tests are more predictive of NCLEX-RN performance than are grades in nursing theory courses. The importance of this finding for nursing education lies in the fact that the variables serve as useful diagnostic tools for advisement of nursing students with regard to the licensure examination.

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