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Faculty and Program Predictors of Pass Rates of Graduates of Nursing Programs in West Virginia on the National Council Licensure Examination for Registered Nurses 1991 to 2000

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ABSTRACT

Faculty and Program Predictors of Pass Rates of
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The purpose of this study was to investigate the relationship between mean student program scores on standardized pre-graduation nursing tests, program attendance policies, grading scales, policies on repeating nursing courses, faculty turnover, degree, teaching experience, clinical nursing experience, part-time faculty, national certification, and NCLEX-RN success in West Virginia nursing programs from 1991-2000. A causal comparative and correlational design was used to investigate the relationship between the dependent variable of NCLEX-RN pass rates and the independent variables. The population of this study consisted of 19 undergraduate nursing programs preparing graduates for entry into practice as registered nurses. Data collection tools utilized were a nursing program survey mailed to the administrative heads of the 19 nursing programs and tool for collecting data from the 187 annual reports submitted to the West Virginia Board of Examiners for Registered Nurses. Significant relationships were found between mandatory classroom attendance policies and pass rates on NCLEX-RN, between mandatory clinical attendance policies and pass rates on NCLEX-RN, between the number of times that students were allowed to repeat nursing courses and pass rates on NCLEX-RN, and between the number of years of clinical nursing experience of faculty outside teaching and pass rates on NCLEX-RN for the graduating class. No significant relationships were identified between standardized pre-graduation comprehensive tests, program size, program grading scales, faculty turnover, years of teaching experience, faculty degree, percentage of part-time faculty, faculty national board certification, and pass rates on NCLEX-RN.

DEDICATION

This dissertation is dedicated to my late husband, Mike Turner, who was my greatest cheerleader and supporter until his death in 2001. Thank you, Mike, for cooking meals while I went to class and keeping them warm for me until I returned late at night, for grocery shopping even when you were tired from a hard day's work, for taking the children to all their activities, for giving me that "kick in the pants" even when I resented it, and for lifting me up when I felt like quitting. I miss you and lovingly dedicate this work to you.

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CHAPTER 1

Introduction

Nursing is a practice that is perhaps as old as humankind. As long as there have been sick and injured persons, there have been nurses, no matter how primitive their skills, to care for them. Nursing care could be provided in the form of a family member, friend, members of the community, or even the afflicted ones themselves without training or education. Early nursing education followed the apprenticeship method and persisted until the 20th century. Even in the early 1900s, nurses could begin a career with as little as an eighth grade education and no formal training within the profession (Leddy & Pepper, 1993). Training was little more than slave labor for the nursing student with inconsistency of standards from one nursing program to another.

Registered nurses (RNs) are the largest segment of the health care work force with 2, 558,874 registered nurses in the United States, of whom 83 %, or 2,115,815, are employed in nursing (Moses, 1998). Registered nurses constitute the largest healthcare occupation, with 2.3 million jobs (Bureau of Labor Statistics, 2004). Of that group, approximately 20 percent worked part-time and about ten per cent held more than one job. They are a diverse group from every state, county, and territory in the nation.

In West Virginia in 2000, there were 22,393 Registered Nurses with active licenses, of which 15,536 were employed full-time, 3,926 part-time, 1,147 unemployed, 596 retired, and 1,187 unknown (West Virginia Board of Examiners for Registered Professional Nurses, 2000). In 1999 there were 19 basic educational

programs for registered nurses to enter into practice. Nine of these were baccalaureate degree programs that are four years in length (West Virginia Board of Examiners for Registered Nurses, 2000). In comparison, there were 21,946 registered nurses holding an active license in 2000, compared to 22,579 in 1994 and 22,333 in West Virginia in 2004 (West Virginia Board of Examiners for Registered Professional Nurses, 2004).

Nursing Education and the Nursing Shortage

Although enrollment in nursing programs is currently rising (National League for Nursing, 2003), during the late 1990s nationwide, there was a decrease in enrollment in all nursing programs. In baccalaureate nursing programs in particular, it is a challenge to attract young, bright students due to confusion and disenchantment about having the same license and role expectations as those who complete the shorter programs. With fewer students entering nursing programs, there are fewer graduates and fewer new nurses to replace those who retire or leave nursing for other reasons.

The average age of the typical RN of 1998 was 42 and will increase to 45 years by 2010 (Buerhaus, 2001). The supply is not likely to keep up with the demand if the current trend continues, especially since 78 million baby boomers will enroll in Medicare by 2020. This will place the RN workforce at 20 % below projected requirements (Buerhaus, 2001).

A study by Buerhaus, Staiger, and Auerbach in 2000 predicted alarming shortages in surgical areas where the oldest hospital nurses work and is not being replaced by younger ones.

> The reduction in enrollment in nursing education and the development of shortages in hospital specialty-care units should be regarded as alarm bells foreshadowing trends that are likely to worsen unless actions are taken to prepare for the future (Buerhaus, 2001, p. 36)

Background

History of nursing education. Nursing education began and developed through an apprenticeship method rather than a formal system of education. Early programs in the 19th century were mostly hospital training schools in which students worked for the instruction provided by the hospitals, but often the hospitals placed ward work above student instruction. Some nursing educators, however, questioned the quality of the student's education because the programs focused upon students working rather than attending classes in which scientific principles were taught. After working eight to twelve hours a day, students were usually too exhausted to concentrate on lectures and homework in their classes (Bullough & Bullough, 1969).

Reform in nursing education (Kelly & Joel, 1996) led to a new curriculum for schools of nursing. This followed a basic three-year sequence that included basic sciences, nursing and experience in caring for patients with medical, surgical, obstetric, pediatric, or special disease conditions. The student was not to work more than eight hours per day. In addition, the student had to be a high school graduate in order to be admitted (Bullough & Bullough, 1969). Pre-nursing courses were detached from hospital training (Kalisch & Kalisch, 1986).

The prototype for today's baccalaureate nursing program was the Yale School of Nursing (Donahue, 1985; Kalisch & Kalisch, 1986). Established in 1924, Yale was a truly collegiate school of nursing with the first to establish a separate university department with its own independent budget and dean. The Yale program consisted of two years of collegiate study, plus 28 months of hospital experience with organized clinical rotations throughout various specialties and public health.

Diploma or hospital-based schools of nursing which thrived during the late 19th century and the first half of the 20th century are clearly in the minority today. No diploma hospital programs exist today in West Virginia (West Virginia Board of Examiners for Registered Professional Nurses, 2000). Only the two-year associate degree and four-year baccalaureate in nursing programs remain.

There has been considerable growth in baccalaureate nursing education since 1950. The most dramatic increase has been since 1967 when nursing began to develop as a scientific discipline. Approximately one-third of all nursing students have been admitted to baccalaureate programs (Leddy and Pepper, 1993). In 1965 the American Nurses Association published its first Position Paper, with posited that nursing education should take place in institutions of learning within the general system of education (Dolan, Fitzpatrick, & Herrman, 1983).

National Council Licensure Examination

Licensure is

> the process by which an agency of government grants permission to *persons* to engage in a given profession or occupation by certifying that those licensed have attained the minimal degree of competency necessary to ensure that the

public health, safety, and welfare will be reasonably well protected (Department of Health, Education, and Welfare, 1971). Licensure is further described by Leddy and Pepper (1993**)** as a police power of the state. Nursing licensure is mandatory in all 50 states; therefore, anyone found practicing nursing without a license faces a fine or imprisonment (Kelly & Joel, 1996; Leddy & Pepper, 1993). Licensure gives nurses the responsibility for safe, competent practice and legal accountability for their actions (Leddy & Pepper, 1993).

Introduced in 1982 through the National League for Nursing, the National Council Licensure Examination for Registered Nurses (NCLEX-RN) was formulated on a national level. NCLEX-RN is one instrument that evaluates the quality of nursing educational programs and ensures minimal competency of its new graduates (Landry, 1997). Licensure examinations may be considered relevant outcome measures of student learning (Landry, 1997).

The NCLEX-RN consists of two major test areas of nursing process and client needs. The nursing process consists of assessment, analysis, collecting data, planning, implementation, and evaluation. Client needs evaluated on NCLEX-RN include safe and effective care environment, physiological integrity, psychosocial integrity, and health promotion/ maintenance (National Council of State Boards of Nursing, 1995). NCLEX-RN was constructed with approximately 10 percent of test-takers expected to fail (Dell & Valine, 1990). As of 1993, the multiple-choice format exam is now offered through computer-adapted testing in all the states and territories to qualified graduates.

Statistics show that students perform comparably on the Computer Adapted Testing (CAT) as on the standard paper-and-pencil examinations (Kelly & Joel, 1996; Landry, 1997). Demographic groups are neither advantaged nor disadvantaged because no special computer skills are required to take the examination. Also, each test is individualized to the taker based on responses to each question (Kelly & Joel, 1996).

West Virginia and Performance on the National Council Licensure Examination

From the years 1985-1995, West Virginia has traditionally ranked near the bottom of all states and territories in the percentage of nursing graduates passing NCLEX-RN, but the state has shown some improvement. From July 1996 to June 1999, the pass rate in West Virginia for first time candidates on the NCLEX-RN was 86.16 %, exceeding the national average of 84.11% (West Virginia Board of Examiners for Registered Professional Nurses, 2000).

Nursing graduates must be successful on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) in order to practice nursing. There are three major reasons for higher education administrators and educators to be concerned about failure on NCLEX. A lower regional, state or national failure rate has an impact on the health care profession for two reasons: it decreases the number of graduates available to the workforce, and it increases the amount of time until the graduate is licensed and can actually contribute to the workforce and the profession (Ashley & O'Neil, 1991).

The second reason is that lower pass rates reflect poorly on the nursing program at institutions of higher education and may ultimately mean budgetary cutbacks or program closure and waning nursing student enrollments. Students often choose programs accredited by the National League for Nursing (Moccia, 1990) and programs with a reputation for high NCLEX pass rates. Nursing education programs in West Virginia were required to have a pass rate of at least 92.5 % of the national average (West Virginia Board of Examiners for Registered Professional Nurses, 1999) during the period of 1991 to 2000.

Faculty may experience frustration and concerns about the reputation of their programs based on licensure exam success or failure (Kopala, Ritzman, & Young, 1982). This has motivated faculty to identify factors related to the program, teaching or students contributing to NCLEX success or failure.

A third reason for studying factors predicting NCLEX performance is the impact of failure on the self-esteem of the graduate and the implications for decreased professional self-confidence (Ashley & O'Neil, 1991). Kopala, Ritzman, and Young (1982) described feelings experienced by graduates who failed the NCLEX as anger, shame and despair.

Predictors of Success on the NCLEX-RN Examination

A review of the literature over the past 20 years reveals many studies relating to performance of graduates on the nursing licensure examination. These studies fall into two categories: student characteristics and performance on the licensure examination and characteristics of the nursing program and performance on the licensure examination.

Student characteristics and NCLEX-RN success. Tests often utilized in nursing programs to measure learning and predict success on NCLEX-RN fall into two categories: standardized and teacher-made tests. Examples of standardized tests include the Mosby AssessTest, the National League for Nursing (NLN) achievement tests, and the Health Education Systems, Incorporated (HESI) examinations. Other examples include an examination offered by Arnett Development Company and the Pre-RN test offered by Educational Resources, Incorporated. The Arnett test was found to predict NCLEX-RN pass rates (Washington & Perkel, 2001). Mosby Assess Test performance has been identified as a significant predictor on NCLEX success (Foti & DeYoung, 1991; Fowles, 1992; McKinney, Small, O'Dell, & Coonrod, 1988). NLN achievement tests have also been shown to be significant predictors of success (Horns, Sullivan, & Goodman, 1991; Lengacher & Keller, 1990; Pangle, 1992; Younger & Grap, 1992). Performance on a comprehensive teacher-made senior examination was not shown to correlate with NCLEX success (Landry, 1997).

Program characteristics and NCLEX-RN success. There is a dearth of literature to support a relationship between faculty characteristics and nursing education program as predictors of success on NCLEX. Only four studies were found in which these variables were measured (Cole, 1981; Davis, Dearman, Schwab & Kitchens, 1992; Landry, 1997; Parry, 1991; Stevens, 1996; Whitley & Chadwick, 1986).

Whitley and Chadwick interviewed 28 graduates who had failed the NCLEX-RN in one baccalaureate nursing program in 1983 to learn what factors the graduates thought contributed to failure. Graduates expressed that the program needed more

clinical practice, better skills laboratory facilities, increased clinical time and more basic teaching (Whitley & Chadwick, 1986). Students recommended giving attention to admission and retention of students, because many of these students were average or below average.

Size of the nursing program. Examining the literature concerning the relationship between nursing program size and pass rates of graduates produces conflicting results. Dell and Valine (1990) contended that a large number of failures on NCLEX-RN occurred in programs with small numbers of graduates. This was refuted by research done by Caldas (1993) and Stevens (1996) utilizing West Virginia programs.

Attendance policies. In efforts to improve student grades and performance on the licensure examination, some schools have enforced stricter attendance policies. Cole (1981) studied policies on class attendance and absenteeism in West Virginia schools of practical nursing. Significant inverse relationships were discovered between absenteeism and performance on the state licensure examination.

Grading scales. No information was found in the literature regarding the relationship between grading scales within nursing courses or a program and program pass rates. Based on personal experience in teaching, this researcher believes, however, that graduates who pass nursing courses by a thin margin are at risk of failing NCLEX-RN.

Policies on repeating of nursing courses. Failure (a grade of D or less) in a nursing course in most programs traditionally prevents students from progressing toward graduation from a nursing program. Programs often have policies regarding

how many times a single course may be repeated and how many total courses can be repeated. Landry (1997) found that repeating nursing courses was strongly correlated with failing the NCLEX-RN.

Faculty turnover. Stevens (1996) recommended that future research be done in the area of faculty turnover and success of graduates on NCLEX. Ray (1986) found that a high rate of turnover in nursing programs was evident in colleges and universities.

Faculty educational levels. If the desired minimal educational preparation for nursing faculty is the doctorate, then the future may be bleak (Leatherman, 2001). reported that in 1999 there was a total of 41,140 doctoral degrees awarded by American universities and that this was a reduction by 3.6 % from the previous year. This is the biggest drop since 1985. One hundred forty of these were earned from West Virginia universities. Women, however, earned 44 % of the doctorates awarded in 1999 and represented the highest proportion of earned doctorates in history for females. Since nursing and nursing faculty are predominantly female, this may be encouraging, however.

The average time invested to earn a doctorate is 7.3 years. A typical recently graduated Ph.D. is white, a U.S. citizen, male, 34 years old, and married (Leatherman, 2001). The typical educator within a nursing program, regardless of degree, is between 45 and 60 years old, female and white (Corcoran, 2003).

Davis, Dearman, Schwab and Kitchens (1992) contended that doctorally prepared nursing faculty may not be prepared for teaching because the focus of doctoral education is usually upon research. In their study of 427 novice nurse

educators, the researchers found that two-thirds of the faculty with master's degrees reported that they had taken only one course for academic credit preparing them to function as educators (Davis, et al, 1992). Ray (1986) concluded that lack of academic credentials posed a major handicap for nursing programs even though credentials were slowly being upgraded. Stevens (1996) recommended that future research concerning whether faculty possessed national certification or were keeping current in their teaching areas.

Findings in a study performed by Stevens (1996) of twenty West Virginia programs over a ten-year period supports conclusions made by Davis. One of the findings was a negative relationship between the percentage of faculty with a doctoral degree and the NCLEX pass rate. This was also supported by research by Landry (1997). Currently, a graduate degree with a major in nursing is required for teaching nursing, but there are two exceptions to this rule. The first exception is that a nursing educator may teach in West Virginia with only a bachelor's degree in nursing if enrolled in a graduate degree program in nursing within one year of employment as a nursing faculty member. Another exception to this rule is for the part-time faculty member who teaches only in the laboratory or clinical setting; this individual is permitted to have only a bachelor's degree with a major in nursing (West Virginia Board of Examiners, 2004).

Full-time and part-time faculty. Stevens' sample (1996) included all West Virginia associate degree, diploma and baccalaureate nursing programs that were in operation in 1996 and that graduated students eligible to take the NCLEX-RN

between 1985 and 1994. Seventy-three percent of the nursing faculty had a full-time status.

Part-time faculty should be kept to a minimum because they are often inadequately screened, may lack experience in teaching or may not be familiar with the curriculum. Administrators often employ part-time faculty as a cost-saving measure, because part-time faculty do not receive benefits nor are they considered for tenure. Statistically significant relationships were discovered between the percentage of part-time faculty and pass rates on NCLEX (Stevens, 1996).

Faculty teaching experience and placement within nursing curriculum.

Administrators should place the best, most experienced faculty in the early nursing courses (Tuckman, 1981). This provides a firmer foundation for the beginning students and promotes the integrity of the curriculum. In one study of West Virginia programs by Stevens (1996), the average number of years of teaching experience was five. This confirms findings by Ray (1986) in which the researcher found that the average nursing faculty member had been employed less than five years and was holding a first teaching position in the academic setting.

To summarize faculty predictors, statistically significant relationships were discovered between the percentage of part-time faculty, number of years of teaching experience, faculty to student ratios and pass rates on NCLEX (Stevens, 1996). Programmatic variables were statistically shown to be poor predictors by Landry (1997) because both passing and failing groups were exposed to mostly the same faculty within one program.

In conclusion, the literature revealed many studies examining the predictability of variables in determining NCLEX success or failure. Most of these studies have examined student characteristics and have found that academic performance variables were strong predictors of success on the licensure examination. Few studies examined variables related to the program itself and to the characteristics of the faculty. No studies were found to examine whether faculty were current in nursing practice in the area in which they taught or possessed national certification in their teaching areas.

Statement of the Problem

Failure on the NCLEX presents a problem to the graduate, to the health care workforce, to nursing higher education in the United States and West Virginia and an even more serious threat to those requiring health care. The purpose of this study is to investigate the relationship between mean program scores on standardized nursing tests, cumulative college GPA, program attendance policies, program grading scales, policies on repeating nursing courses, percentage of faculty turnover, faculty degree attainment, faculty to student ratios, years of full-time teaching experience and placement within the nursing curriculum, percentage of part-time faculty, percentage of faculty holding national certification, and success of graduates on the NCLEX-RN in nursing programs in West Virginia over a ten-year period.

Theoretical Framework

Kerlinger defined theory as “a set of interrelated constructs, definitions, and propositions that present a systematic view of phenomena by specifying relations

among variables, with the purpose of explaining and predicting the phenomena" (Kerlinger, 1986, p. 9). One way of viewing phenomena is through general systems theory which has been widely used in a variety of disciplines. First introduced by Ludwig von Bertalanffy in the 1930s, the theory applies basic principles of biology. Although the theory was originally intended to apply to a living organism, it was adapted to organizations as well. A system consists of complex interacting elements including the following components: input, output, boundary, environment, and feedback (Bertalanffy, 1968).

Inputs may be "physical, human, material, financial, and information" variables which undergo a transformation and leave the system as outputs (Blais, Hayes, Kozier, & Erb, 2002, p. 158) into the larger environment. A nursing education program can be viewed as a system with input variables such as students, faculty, resources, and policies. In this research study, the input variables are programmatic variables dealing with characteristics of the faculty such as educational preparation, years of experience in nursing, years of teaching experience, and national certification. Other input variables related to faculty are full-time and part-time status, turnover, and faculty-student teaching ratios.

The ultimate goal of the nursing program is to build up the nursing profession by producing qualified, licensed nurses. One output variable is the pre-graduation standardized examinations, such as Educational Resources Incorporated Pre-RN Examination, Health Education Systems Incorporated (HESI) Exit Examination, and Mosby AssessTest. These may be predictors of success on NCLEX-RN, which is the

ultimate output variable. Relationships between these and other program and faculty variables will be the focus of this study.

Research Questions

The study was designed to answer the following research questions:

Q1. What is the relationship, if any, between average scores of a graduating nursing class of a nursing program on pre-graduation standardized achievement tests, such as Mosby AssessTest, ERI Pre-RN and HESI Exit Exam, and success rates of these graduates on the National Council Licensure Examination for Registered Nurses (NCLEX-RN)?

Q2. What is the relationship, if any, between size of nursing programs and success of graduates on NCLEX-RN?

Q3. What is the relationship, if any, between attendance policies for the classroom in nursing programs and success of graduates on NCLEX-RN?

Q4. What is the relationship, if any, between attendance policies for the clinical area in nursing programs and success of graduates on NCLEX-RN?

Q5. What is the relationship, if any, between grading scales in nursing programs and success of graduates on NCLEX-RN?

Q6. What is the relationship, if any, between the number of times a program allows students to repeat nursing courses and the success of its graduates on NCLEX-RN?

Q7. What is the relationship, if any, between faculty turnover in a nursing program and the success of its graduates on NCLEX-RN?

Q8. What is the relationship, if any, between the highest degrees held by faculty and success of graduates on NCLEX-RN?

Q9. What is the relationship, if any, between the number of years of full-time teaching experience of nursing faculty and success of graduates on NCLEX-RN?

Q10. What is the relationship, if any, between the number of years of nursing service experience of faculty and success of graduates on NCLEX-RN?

Q11. What is the relationship, if any, between the percentage of part-time nursing faculty and success of graduates on NCLEX-RN?

Q12. What is the relationship, if any, between the percentage of faculty holding national certification in their teaching areas and success of graduates on NCLEX-RN?

Operational Definitions of Variables

Achievement test score– mean score of a graduating class on a comprehensive nursing examination prepared by such companies as Mosby, Incorporated, Educational Resources, Incorporated, Health Educational Systems Incorporated, Arnett Computer Adapted Test, and listed on the annual report to West Virginia Board of Examiners.

Attendance – response by dean, director or program chair on questionnaire describing a nursing program's policy on student attendance in didactic nursing classes and clinical courses such as laboratory or hospital settings.

Certification - response on data collection tool indicating percentage of faculty possessing national certification in teaching area.

Faculty education level – numerical figure on data collection tool representing the percentage of faculty by highest educational preparation of faculty member.

Faculty employment status – numerical figure on data collection tool representing percentage of part-time or full-time teaching status at the employing college or university.

Faculty teaching experience – numerical figure on data collection tool representing the percentage of faculty for a range of numbers of years of full-time teaching experience in nursing.

Grading scales – numerical figures reported by dean, director or program chair on questionnaire indicating numerical percentages to indicate ranges for letter grades of A, B, C, D, and F within a nursing program.

Level of program – numerical figure on data collection tool indicating whether program awards the associate degree or baccalaureate degree in nursing.

Mosby AssessTest score – average score obtained by graduating class of a nursing program on the Mosby AssessTest as listed on the annual report to the West Virginia Board of Examiners for Registered Nurses.

NCLEX success – percentage of a graduating class who obtain a passing score in a single calendar year on the National Council Licensure Examination for Registered Nurses.

New faculty – numerical response on data collection tool indicating percentage of faculty in a particular year and not named in the previous year's report to the West Virginia Board of Examiners for Registered Nurses.

Nursing service experience – numerical response on data collection tool indicating the percentage of years non-teaching nursing work experience as indicated on the annual report to the West Virginia Board of Examiners for Registered Nurses.

Program size – numerical response on data collection tool indicating number of graduates in an academic year as listed on the annual report to the West Virginia Board of Examiners for Registered Nurses.

Repeating of nursing courses – numerical response submitted by dean, director or program chair of nursing program indicating the number of times program allows students to enroll in a nursing course after failing it and how many courses that can be repeated.

Turnover - percentage of nursing faculty leaving employment at a college or university and the replacement with new faculty over one year as indicated on the annual report to the West Virginia Board of Examiners for Registered Nurses.

Significance of the Study

Prospective students, graduates, the health care industry and nursing higher education faculty and administrators are very interested in program NCLEX pass rates. Program pass rates may determine which nursing education program a prospective student chooses; the students may avoid a program with a low NCLEX pass rate for fear they too may enroll in a program with a poor record of preparing its students for the licensure exam. Pass rates are significant to the graduates because

passing NCLEX will mean they can begin gainful employment, repay student loans and support themselves and become productive members of society. It is significant to the healthcare industry and consumers because there are already an insufficient number of nurses available to fill vacancies and to care for patients in need of their services. Graduate nurses who have spent weeks or months orienting with a preceptor and then fail NCLEX lose their positions and cost the agency money that it has invested.

Gulick and Urwich (1969) outline seven functions of administrators. These include planning, organizing, staffing, directing, coordinating, reporting and budgeting. These functions can be applied to the various roles in higher education administration.

For the college or university president, chief academic officer, chief business officer, enrollments and admissions director, and the dean of nursing, there is significance to the short and long-term planning function relative to the number of students applying to and accepted by the program. Failures on NCLEX may mean future declining student enrollments and possibly budgetary cutbacks, loss of accreditation and possibly elimination of the program. Consequently, deans need to be aware of factors correlated with success on NCLEX.

To the chief academic officer and dean of nursing, student enrollments may determine how the nursing program is organized. Faculty and department chair positions may not be filled if they are vacated when the enrollments do not justify the full-time equivalencies. This may require changes in the organizational structure of the nursing program.

For the chief academic officer, chief business officer, and dean of nursing, staffing changes may be affected by student enrollments. One nursing faculty per eight students in the clinical area is the standard in West Virginia (West Virginia Board of Examiners for Registered Nurses, 1999). Careful screening and hiring of new faculty should yield those most capable of teaching undergraduate students effectively. The need to utilize part-time faculty may exist but should be kept to a minimum.

Deans and higher administrators in the institution may need to direct faculty and staff to perform workload studies in order to discover how employees utilize their time on the job. Declining student enrollments may mean decreased need for faculty; therefore, cutbacks may become necessary. The dean must direct and coordinate the workforce to meet the requirements of respective job descriptions. In addition, poor pass rates and declining student enrollments may mean directing educators to develop themselves professionally through certification and pursuing the highest degree within their fields.

There are ramifications in the evaluation function to the college or university president, chief academic officer, director of assessment, and the dean and department chairs in nursing. Strengths, weaknesses and goals are identified by the nursing program and reported annually to the West Virginia Board of Examiners for Registered Nurses and approximately every five years to the National League for Nursing.

Currently in the state of West Virginia, a school whose pass rate drops below 80 % for two out of three consecutive years may receive provisional accreditation

status. If the schools has failed to come into compliance with the 80 % pass rate within three years beyond the time provisional status was granted, that program may have its accreditation withdrawn (West Virginia Board of Examiners, 2003).

Provisional status and loss of state board accreditation pose a serious threat to the integrity of the program with a possible loss of its good reputation in the community, state and region. Students may not desire to apply to an unaccredited program nor want to risk failing the NCLEX and not being licensed as a Registered Nurse. Because expense of operating a nursing program usually exceeds the revenue generated for the institution, it may be difficult to justify the program's existence or worth to the institution.

Limitations and Assumptions

The ability to generalize based on this study will be limited to institutions with associate degree and baccalaureate nursing programs within West Virginia. Since this study examined annual reports from all the professional nursing programs in the state of West Virginia over a ten-year period, there was no randomness to the sample. This poses a threat to the external validity of the study (Campbell and Stanley, 1965).

It will be assumed that data contained in records of graduates and those received by the West Virginia Board of Examiners are correct. Data relating to program and faculty characteristics also will be assumed to be accurate.

Hypotheses

Based on the literature, the following hypotheses have been formulated from the research questions:

Hypothesis 1. The higher the mean of scores of a graduating nursing class of a nursing program on pre-graduation standardized achievement tests, then the higher the average pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.

Hypothesis 2. The greater the size of the nursing program, then the higher the pass rate will be on the NCLEX-RN for that graduating class.

Hypothesis 3. The stricter the attendance policy for the classroom, then the higher the pass rate will be on the NCLEX-RN for that graduating class.

Hypothesis 4. The stricter the attendance policy for the clinical area, then the higher the pass rate will be on the NCLEX-RN for that graduating class.

Hypothesis 5. The higher the grading scale by percentage score designated by a program for a letter grade, then the higher the pass rate will be on the NCLEX-RN for that graduating class.

Hypothesis 6. The lower the number of times students are allowed to repeat nursing courses within a program, then the higher the pass rate will be on the NCLEX-RN for that graduating class.

Hypothesis 7. The lower the rate of faculty turnover in a nursing program, then the higher the pass rate will be on the NCLEX-RN for that graduating class.

Hypothesis 8. The higher the number of years full-time teaching experience of nursing faculty, then the higher the pass rate will be on the NCLEX-RN for that graduating class.

Hypothesis 9. The higher the number of years of nursing service experience of faculty outside teaching, then the higher the pass rate will be on the NCLEX-RN for that graduating class.

Hypothesis 10. The higher percentage of highest degree held by faculty, then the higher the pass rate will be on the NCLEX-RN for that graduating class.

Hypothesis 11. The lower percentage of part-time faculty for a class, then the higher the pass rate will be on the NCLEX-RN for that graduating class.

Hypothesis 12. The higher the percentage of faculty possessing national certification by class, then the higher the pass rate will be on the NCLEX-RN for that graduating class.

Summary

Factors predicting success or failure on NCLEX have been a source of concern to nursing faculty and administrators. If program and faculty factors in NCLEX success can be identified, then administrators may more efficiently utilize and hire faculty with the appropriate level of educational preparation and professional expertise. NCLEX success may affect the financial stability of a program or the entire institution based on student enrollments; therefore, research is needed to identify accurate predictors of success.

CHAPTER 2

Review of Literature

Introduction

As the nation faces the most serious nursing shortage of all times (Heller, Oros & Durney-Crowly, 1999), nurse educators are challenged to produce as many graduates as possible to meet the changing needs of society. Yet faculty must maintain standards to graduate those who demonstrate terminal program competencies in order to pass the National Council Licensure Examination (NCLEX), because no graduate may become licensed without passing the examination. Educators must learn through research which factors intertwined with the education of its students will facilitate passing the licensure examination after graduation. That is the purpose of this study. Before beginning the review of the literature related to predictors of success on the National Council Licensure Examination for Registered Nurses (NCLEX), a brief history of nursing education will be provided in addition to insights into the current nursing shortage.

Shortly before the end of the 20th century, the National League for Nursing (NLN) published an article about the future of nursing education. Challenges and opportunities for educators were outlined with the transformations taking place in nursing and nursing education forming the basis. Heller, Oros and Durney-Crowley (1999) identified ten trends. Three of these trends are pertinent to this study and are as follows:

Changing demographics and increasing diversity

With the "Baby Boomers" reaching the age of retirement, this means that by 2020 more than 20 % of the population will be at least 65 years of age. As life expectancy increases, the fasting growing age group will be those over age 85 years; however, chronic and acute health care problems will plague this group. In addition, both the clients nursing serves and the student population is becoming increasingly diverse both ethnically and racially, proposing a challenge to nursing educators to offer flexibility in scheduling especially for the older working students raising families and yet still recruit traditional bright students (Heller, Oros & Durney-Crowley, 1999).

The current nursing shortage and opportunities for lifelong learning and workforce development

Nursing shortages negatively affect patient care and increase cost to the health care industry. There is a significant nursing shortage particularly in acute and long-term care setting today. One contributing factor is the perception by many women is that nursing is merely a job or a trade rather than a profession; therefore, young females often pursue other majors in college. Older students choose nursing instead which means that there total possible number of years of practice decreases (Heller, Oros & Durney-Crowley, 1999).

Experts judge the nursing shortage of today to be deeper than those of the past and less likely to be rectified by short-term economic strategies. One benefit to graduates is that salaries and job perquisites such as flexible scheduling will most likely increase. More career opportunities within nursing will be likely in

biotechnology, case management, and pharmaceutical companies just to name a few (Heller, Oros & Durney-Crowley, 1999).

Nursing education and administrators must work more aggressively with the health care industry to recruit qualified applicants. There are implications to work with the media to market nursing and to change outdated images and the public's perceptions of nurses. Nurse managers and executives require clinical experience and strong communication, business and management skills. Nursing programs may have to expand or revamp their programs to meet these needs (Heller, et al., 1999).

Significant advances in nursing science and research

Heller, Oros and Durbin-Crowley (1999) contend schools of nursing have not sufficiently placed top priorities on the scholarship and science of nursing. Although it is more common for nurses to obtain graduate degrees, there are still not enough doctorally prepared nurses to meet growing needs. Institutions of higher education and nursing programs should investigate opportunities to work with academic health centers to provide research opportunities for nursing scholars (Heller, et al., 1999).

In summary, the challenge to nursing faculty and administrators is to undergo a paradigm shift due to changing patient and student demographics, technological advances and globalization of health care. Administrators and faculty must be willing to change from comfortable practices which may not be effective and which may not prepare graduates to be successful on NCLEX. This may exacerbate the shortage of qualified nursing faculty who may seek employment in other fields of nursing if they lose their comfort zones in academia.

National Council Licensure Examination for Registered Nurses

The final hurdle in the race toward practicing as a registered nurse is passing the National Council Licensure Examination for Registered Nurses (NCLEX-RN). Unless graduates pass NCLEX, they cannot become licensed. Without licensure, a nurse may not practice due to mandatory licensure in all fifty states (Leddy & Pepper, 1993).

The NCLEX-RN consists of two major test areas of nursing process and client needs. The nursing process consists of assessment, analysis, collecting data, planning, implementation, and evaluation. Client needs evaluated on NCLEX-RN are safe and effective care environment, physiological integrity, psychosocial integrity, and health promotion/ maintenance (National Council of State Boards of Nursing, 2001). NCLEX-RN was constructed with approximately 10 % expected to fail (Dell & Valine, 1990). As of 1993, the multiple-choice format exam is now offered through computer-aided testing in all the states and territories to qualified graduates**.**

The format of the examination is multiple-choice questions testing decision-making skills rather than simple recall of facts. Based upon client needs and the nursing process, questions represent different levels of difficulty with competence estimates calculated according to responses of the graduate. The computer searches through the question database for the question determined to measure the candidate's ability in the appropriate test plan. Questions are displayed on the screen in this manner until a sufficient number of responses have been given to show whether the graduate passed or failed the examination (Kelly & Joel, 1996).

A failing score means delay in licensure and ability to practice as an RN. Failures also may reflect negatively on the nursing program and parent institution. Factors predicting success on the NCLEX have been the subject of research over at least three decades; however, no magical formula has been found to assure that graduates pass NCLEX.

The review of the literature which follows examines predictors of success relating to the students and to the program. Outcome predictors include performance on standardized comprehensive nursing examinations including the Arnett Development Test, the Mosby Assess Test, Health Education Systems Incorporated (HESI) tests, and Educational Resources, Incorporated (ERI). These are completed by the student prior to graduation from the nursing program.

Program predictors studied in the literature include size of the nursing program, attendance policies, grading scales, repeating of nursing courses after making a failing grade, faculty turnover, faculty educational level; full-time and part-time faculty, faculty to student ratios, faculty teaching experience and national certification in the teaching area.

Outcome Variables

Standardized Examinations for Nursing Prior to Graduation

Mosby AssessTest. Mosby AssessTest prepares students for the licensure exam by assessing knowledge and abilities before taking NCLEX. Its format is very similar to NCLEX using the stand-alone format and distribution of content according to the most recent NCLEX-RN test plan (Saxton, Pelikan, Green, & Nugent, 2004). Between 1991 and 2000, this test consisted of 300 questions. At the present time the number of questions has been decreased to 265 (Saxton, et al., 2004).

The Mosby AssessTest analyzes individual strengths and weaknesses for nursing process, clinical area, and focus of care.

> After testing, the student receives a list of questions answered incorrectly as well as a booklet containing classification, correct answers, and rationales for all options. The institutional computer report summarizes group performance in the same categories as the individual profile and assists instructors in evaluating the group's strengths and weaknesses." (Saxton, et al., 2004).

The Mosby AssessTest performance has been identified as a significant predictor on NCLEX success in several studies (Foti & DeYoung, 1991; Fowles, 1992; Jenks, Selekman, Bross, & Paquet, 1989; McKinney, Small, O'Dell, & Coonrod, 1988). Mosby AssessTest scores were not shown to have predictive value in a 1993 study of 92 baccalaureate nursing graduates of a private, church affiliated liberal arts college in the Midwest (Wall, Miller, Widerquist, 1993). Three of the supporting studies will be described here.

Jenks and associates utilized a sample consisting of 407 graduates of an integrated upper division baccalaureate nursing program from 1984-1987 in a study. Their purpose was to predict variables which would identify students at high risk of failing NCLEX and to determine the point at which faculty could intervene in order to remediate these students (Jenks, Selekman, Bross & Paquet, 1989).

Statistics employed by these researchers were the Pearson Product Moment Correlation Coefficient and stepwise regression analysis. Significant ($p < .0001$-$.01$) predictor variables were found to be as follows: lower division GPA, science GPA, type of lower division college, age, sex, junior level nursing course grades, senior level nursing course grades and the Mosby AssessTest. Findings were that by the end of the junior year, at risk students could be identified and programs for remediation could be introduced at that time (Jenks, et al., 1989).

The Mosby AssessTest was also studied and determined to have predictive value in passing NCLEX in a 1991 study by Foti and DeYoung. A retrospective review of the records of 296 graduates between 1985 and 1988 was performed. Employing the same statistics as the Jenks study, they learned that through multiple regression analysis the best combination of predictors included the SAT verbal score, overall GPA and the Mosby AssessTest score ($p < .01$) (Foti & DeYoung, 1991).

Similar to the Jenks study was one performed by Fowles in 1992 in which 192 graduates of an upper division baccalaureate nursing program comprised the sample. The purpose of her study was to identify variables within the nursing curriculum which would successfully predict passing NCLEX on the first try. Stepwise multiple regression analysis and correlation coefficients were performed.

Significant variables were determined to be GPA, ACT composite, anatomy and physiology course grades and the Mosby AssessTest ($p < .05$). This supported previous findings by Foti and DeYoung and Jenks and associates.

The most recent study found in the literature is one performed by Beeson and Kissling (2001) in which data from graduates of one baccalaureate nursing program between 1993 and 1998 were examined. Performed retrospectively, the authors investigated relationships between independent variables such as cumulative grade point average, performance in upper level nursing courses, and scores on the Mosby AssessTest and the dependent variable of NCLEX-RN performance.

The Mosby AssessTest, administered to students at the end of their first semester in the senior year, was found to be a significant predictor of success or failure on NCLEX-RN. Significant differences between passing the NCLEX-RN as compared to students who failed the NCLEX-RN for students who had high scores on the Mosby test versus those who scored poorly. "For each increase of 10 percentage points on the Mosby AssessTest, the odds of failing decreased 150 per cent . . ." (Beeson & Kissling, 2001, p. 124).

Statistical methods utilized by Beeson and Kissling (2001) included a two-sample T-test for the Mosby score. The authors also used logistic regression analysis to predict probability of failure on NCLEX based on this independent variable. Prior to using logistic regression, the authors divided the sample randomly in half with one group being called a training sample and the other referred to as a validation sample to test the model. Beeson and Kissling found no significant differences between the two groups. Using the logistic regression model that was developed, 85.8 % of those

passing NCLEX-RN, the validation sample were correctly predicted to pass. This was compared to 66.7 % of those failing NCLEX correctly predicted to do so using the model.

The Mosby AssessTest scores were variables studied in relation to NCLEX success in a 1993 study by Wall and associates. As previously mentioned in the Mosby AssessTest section, this sample was comprised of 92 graduates of an NLN accredited, private, church supported baccalaureate nursing program in the Midwest. Statistical methods employed were t-tests and discriminate function analysis ($p < .05$). The variables which best predicted passing NCLEX on the first attempt were scores on the NLN achievement tests taken at the end of each nursing course as well as high school class rank and various forms of the GPA. The recommendations by these authors were to identify at-risk students in these areas by the end of the junior year and to begin interventions to help the students be successful in the senior year and on NCLEX (Wall, Miller & Widerquist, 1993).

Landry noted that conversations with faculty about student performance and attitudes toward the standardized examinations taken prior to graduation at one university. Since the students' grades were not affected by their performance on the standardized examination, students may not have taken the examination seriously. She recommended that faculty devise a means of imparting the importance of the examination to the student (Landry, 1997). One such possibility would be to require the student to make a certain score in order to progress on to the next nursing course or to graduate if it was in the last semester.

Arnett Development Company NCLEX Computer Aided Test (CAT).

Probably due to the fact that the Arnett Development Company (ADC) test is very new, there was nothing found in the literature to establish it as a predictor on NCLEX. Two West Virginia programs, however, currently use ADC for students in the last year of the basic nursing program (West Virginia Board of Examiners, 2000). It was noted that in a public, two-year nursing program in the southeast, achievement tests are given throughout the program. They are given at the end of each course and at the end of each level. Students are expected to score at the 50 percentile (or higher) on each test. "On the Arnett testing a score of the 70% is expected and remediation will be required for those students scoring below the 70%." (Dyersburg State Community College, 2004).

Educational Research, Incorporated, Pre-RN Test. The Pre-RN examination "provides diagnostic information to nursing candidates prior to taking the licensure exam. . . (and) serves as an achievement or exit test at the end of the RN program" (ERI World, 2004). The author notes that this examination emphasizes and tests content, knowledge base and recall more than application, which the NCLEX-RN heavily emphasizes. Simmons (2002) performed criterion-related or predictive validity studies on the Pre-RN examination using 98 nursing programs and a total of 2,358 students across the United States. Administrators from participating nursing programs reported their school's pass rates to Educational Resources, Incorporated. The results showed that the composite score on Pre-RN Examination is predictive of first time NCLEX-RN passage.

Health Education Systems, Incorporated (HESI) Exit Exam. The HESI Exit Examination is a comprehensive, computer supported test designed to be given in the last semester of study within the nursing program. It utilizes the same test plan as NCLEX-RN in order to simulate the nursing licensure examination as much as possible. HESI provides the student with a predictability score, derived from the HESI Predictability model, which estimates how likely the student is to pass the actual NCLEX-RN. The minimum score predicting a student to pass is 850 (Health Education Systems Incorporated, 2004). This score is then provided immediately to the student upon completion of the test and in written form to faculty and administrators of the nursing program. Students not predicted to pass may have to remediate and retake the HESI exit exam up to three times before graduation in one nursing program in West Virginia.

Nibert, Young, and Adamson (2002) reported on a study using a descriptive comparative design. The HESI Exit Examination was found to be an accurate predictor of NCLEX-RN pass rates during the 1999-2000 academic year. The degree of predictability for HESI Exit was determined to be 98.46 %.

Input Variables

Program Predictors of Success on NCLEX

There is a dearth in the nursing literature concerning variables associated with the institution or program and the relationship to performance of graduates on the NCLEX. The following reflects a review of the input variables in the literature.

Program size. A large number of failures on NCLEX come from small schools or programs (Dell & Valine, 1990). They contend that this may be explained

by the fact that larger more prestigious schools recruit and retain the best and the brightest students while the smaller schools struggle to maintain enrollments by having lower admission standards. Conclusions by Dell and Valine were refuted by Stevens (1996) when she found that the largest school and nursing program in the state of West Virginia had one of the lowest pass rates during a ten-year period. This program had a total of 714 graduates over the ten-year period.

Attendance policies. A significant inverse relationship was found by Cole (1981) between absenteeism and pass rates on the licensure examination for graduates of practical nursing programs in West Virginia. Data specifying the actual number of days of instruction a student missed within the program were collected.

Grading scales. Nothing was found in the literature concerning the relationship to grading scales and success on standardized examinations or on NCLEX**.** This is an area of curiosity and interest to this researcher. Although no studies regarding grades have been found in the literature, the problem of grade inflation appears to be a problem in institutions of higher education in the United States. A Harvard University government professor, Harvey Mansfield contended that even Ivy League schools such as Harvard coddle their students and inflate their grades. Students tell others aspiring to a prestigious Harvard education those admission standards are high, but academics are not difficult there. Mansfield gave his students two grades: the first being the grade actually earned by the student and the second being the grade he feels would be bestowed by his fellow Harvard professors (Mansfield, 2003).

It is possible that faculty of nursing programs, in their effort to graduate students and add them to the nursing workforce, may be too generous with grades. The grading scale for the nursing program may reflect this philosophy.

Repeating nursing courses. The only study found in the literature relating to the repeating of nursing courses was one done by Landry (1997). In her study of one university over a ten-year period, she found that having to repeat a nursing course was correlated with failure on the NCLEX. Also, having to repeat science courses was also associated with NCLEX failure. When means of passing and failing groups on NCLEX over a seven year period were compared using t-tests, the two groups differed significantly on the total number of nursing and support courses repeated. If a student received less than a C in a nursing or support course (non-nursing courses required for the major), then the student was required to repeat the course in order to progress and have the minimum GPA of 2.0.

Faculty turnover. A stable nursing faculty is a strong point of a nursing program. The inevitable consequence of an aging nursing faculty will eventually be turnover in order to replace them and maintain the program; however, turnover may occur for many other reasons besides retirement. Regardless of the reasons, turnover is a variable which may contribute to decreased student outcomes such as pass rates on NCLEX.

One reason for nursing faculty turnover is burnout--the focus of a study by Blanks (1983). The author tested her own causal model of nursing faculty burnout, which consisted of five components or variables. The independent variables in the model were background variables, organizational determinants, environmental

determinants and outcome determinants. Burnout syndrome is the dependent variable.

Background variables included age and previous work experience. Organizational determinants were work overload, routinization, pay, communication, participation, level taught, role clarity, support network, autonomy, integration and alienation. Outcome determinants were person-role fit, competence, fair treatment, and boredom. Environmental determinants included family responsibilities, opportunity to change jobs, and opportunities to leave the job (Blanks, 1983).

The fifth component of the model and dependent variable was burnout syndrome. This consisted of three parts: emotional exhaustion, depersonalization and reduced personal accomplishment. Results were obtained through the use of the Maslach Burnout Inventory and another questionnaire about student attrition (Blanks, 1983).

Results were obtained from 166 generic baccalaureate nursing faculty in a Midwestern state. Multiple regression analysis was employed to identify the independent variables which best predicted the particular component of burnout of nursing faculty. It was found that reduced personal accomplishment could best be accounted for by the four independent variable named previously (Blanks, 1983). Recommendations made by Blanks were that administrators of nursing programs improve job design, foster communication, clarify existing rules and regulations, and support professionalism.

In light of this fact, a later study attempted to identify factors contributing to the retention of existing part-time faculty in nursing programs. Wolfertz (1999)

qualitatively and quantitatively studied five associate degree nursing programs in Connecticut in order to investigate effects of institutional climate on part-time faculty.

One possible explanation for the shortage of qualified nursing educators is low salaries compared to a nurse working outside of academia with comparable years of nursing work experience. Stevens (1996) cited the Almanac Issue of "The Chronicle of Higher Education" (September 1, 1994). It reported the national average salary of nursing faculty from $30, 139 for instructors in private four-year institutions to $53,005 for full professors in public four-year institutions. At that time salary ranges for full-time faculty in West Virginia were from $27,565 in public two-year colleges to $52,189 for professors in public four-year institutions.

Eckelbecker (2003) reported that nursing instructors in Massachusetts earned as little as half the salary they earned as staff nurses in hospital settings. Nurses burned out from the hospital setting were often attracted to teaching positions because the work environments were less stressful, but soon became frustrated and disillusioned to be unable to devote themselves solely to teaching. They were surprised and frustrated to find the faculty workload which included many non-teaching responsibilities in practice, research, and committees. Long hours doing non-teaching tasks with few monetary rewards contribute to burnout in nursing faculty.

Faculty education. Although it is the goal within higher education for all faculty teaching in a baccalaureate degree program to have a terminal degree, the literature has not always supported that this is correlated with positive educational outcomes. Faculty involved in the pursuit of a doctorate spend a great deal of time in

course work and research perhaps unrelated to entry knowledge and skills they are required to teach within their programs (Stevens, 1996). Although Ray (1986) concluded that lack of academic credentials posed a major handicap for nursing programs even though credentials were slowly being upgraded, Stevens (1996) found a negative correlation between the percent of faculty with a doctoral degree and the pass rate on NCLEX.

Davis, Dearman, Schwab and Kitchens (1992) contended that doctorally prepared nursing faculty may not be prepared for teaching, because the focus of doctoral education is usually upon research. In their study of 427 novice nurse educators, it was revealed that two-thirds of the faculty with master's degrees reported that they had taken only one course for academic credit preparing them to function as educators (Davis, et al, 1992).

Landry (1997) stated, "T-tests showed that the failure group was assigned to more full-time classroom faculty with higher academic credentials and more teaching credentials than the pass group" (pp. 116-117). She showed that when comparing means of failing and passing groups on NCLEX at a state supported university over a seven-year period that a higher percentage of doctorally prepared faculty existed in the failing group. This supports findings by Stevens on a statewide level.

Teaching experience. A statistically significant relationship was found between the number of years teaching experience of nursing faculty in West Virginia and the NCLEX-RN pass rate. This means that the higher the average number of years of teaching experience within the faculty in an academic year, then the higher the NCLEX pass rate was (Stevens, 1996). Landry (1997) refuted the findings of

Stevens when she found that mean years of teaching experience of classroom faculty negatively correlated with NCLEX-RN pass rates; however, the higher the credentials of clinical teaching faculty, then the higher the NCLEX-RN pass rates. This led to Landry's recommendation that administration strive to retain highly qualified clinical faculty (Landry, 1997).

Percentage of full and part-time faculty. Statistically significant relationships were discovered between the percentage of full-time faculty and pass rates on NCLEX (Stevens, 1996). Simply stated, the greater the percentage full-time versus part-time faculty within a program during an academic year, the higher the pass rate was on NCLEX.

Stevens's findings were refuted in part by Landry (1997) in percent of full-time classroom faculty. Significant differences were found between the means of the two outcomes groups of those passing and those failing NCLEX on the first attempt. The interesting point is that the failing group had a higher percentage of full-time teaching faculty than the passing group.

The Community College Goals Inventory was completed by the sample of program administrators as well as part-time and full-time faculty (n=49) in associate degree nursing programs in Connecticut. Findings demonstrated that economic issues such as benefits and job security were significant factors. Also significant intrinsic rewards were a sense of connectedness with the program and feeling they are valued and seen as credible contributed to job satisfaction and retention. Wolfertz (1999) contended that administrators must invest time and resources into mentoring, developing, communicating with and rewarding faculty in order to retain them.

Faculty to student ratios. Although there is little to be found in the nursing literature about the number of students a faculty member may teach in one course, this may be a significant factor to predict success of a program on NCLEX pass rates. Two studies were found relating to higher education in general on this topic.

The first study was conducted by Scheck, Kinicki and Webster (1994) in which effects of class sizes were investigated at a large southwestern university. Students in five sections of a business course were the subjects. A random sample was obtained and divided into two groups; there were 70 students from the large sections and 70 from the smaller sections of the course. Student responses were elicited through a questionnaire scored with a Likert-type scale in which the following variables were measured: student affective responses, teacher-initiating and consideration behaviors, student motivation, and student satisfaction with the class. Student performance outcomes were measured by the student's final grade in the course.

The Scheck study provided evidence that large class size negatively affected teacher behaviors. Also, Scheck and associates found that class size was inversely related to student performance. The researchers recommended that universities limit enrollment in large classes to stronger students academically if at all possible.

Parry (1991) reported that student/faculty ratios in nursing clinical rotations showed a positive correlation with pass rates on NCLEX within Ohio nursing programs. (n=26) This is supported by research within West Virginia by Stevens (1996). It is also supported by Caldas (1993) in which class size was positively correlated with student achievement. Statistically significant relationships were

discovered between faculty to student ratios and pass rates on NCLEX.

National certification of faculty. Stevens (1996) recommended that future research involve whether faculty possessed national certification or were keeping current in their teaching areas. By doing this, doctorally prepared nursing faculty would keep "in touch with the real world" of nursing practice. This would also apply to faculty with less than the doctoral degree. Bowen and Schuster (1986) asserted that teaching competency in a field requiring practical application, such as nursing, means that the teacher must possess the knowledge and ability to successfully and competently practice in the field.

In summary, this review of the literature has examined studies relating to student and faculty or programmatic predictors of success on NCLEX. The literature is abundant with studies of student characteristics with significant predictors being grades on standardized pre-graduation examinations and variations of the GPA. There is little in the nursing literature concerning programmatic factors; however, studies by Landry and Stevens provide the most insight into faculty characteristics such as employment, experience, part-time and full-time status, and education and their relationships to NCLEX success.

CHAPTER 3

Methodology

The purpose of this study was to determine the relationship between selected characteristics of nursing programs in West Virginia and the percentage of graduates passing the National Council Licensure Examination for Registered Nurses (NCLEX-RN). The study examined program data obtained from the West Virginia Board of Examiners for Registered Nurses and individual nursing programs in West Virginia from the Fall 1991 semester through the Spring 2000 semester. This study compared program, program faculty, graduating class pre-graduation standardized examination scores, and pass rates of graduates on NCLEX-RN.

Population and Sample

The population of this study consisted of 19 West Virginia programs of nursing that qualify graduates to become registered nurses from 1991 to 2000. One program opened during this period, so data were only available from 1994 through 2000. Because data were gathered from all programs in the population, the sample and the population were the same. Because data were only from one state, West Virginia, generalizability of the study is limited.

Design

This study utilized a causal comparative and correlational design to investigate the relationship between the dependent variable of NCLEX-RN pass rates and the independent variables. Because it was beyond the investigator's ability to

control the independent variables, this design was appropriate for the study. Data were obtained through archival reports from the West Virginia Board of Examiners for Registered Nurses (WVBOE) from data submitted by each dean, director or program chair for programs studied and from surveys completed by the aforementioned administrators.

Data Collection

The researcher collected data from the annual report submitted by each program to the West Virginia Board of Examiners for Registered Nurses (WVBOE) (Stevens, 1996). Permission was obtained from the WVBOE in order for the investigator to examine records on file in the board office for the time period during times mutually convenient to the researcher and the WVBOE. A data collection tool (Stevens, 1996) adapted by this investigator was utilized (Appendix A).

In order to procure data not obtainable from the WVBOE, a survey designed by this investigator was sent to each of the deans and directors during the spring semester of 2001 (Appendix B). Deans, directors or program chairs were contacted by electronic mail to familiarize them with the study and to promote completion on a timely basis. This researcher in order to encourage participation and expedite the return of data provided a stamped, self-addressed envelope. Follow-up telephone calls and electronic mails were sent to attempt to obtain responses from those who did not respond to the initial mailing.

Data Analysis

The data were first entered into Microsoft Excel and later transferred into SPSS. Data for each program included average scores of graduates on standardized achievement tests (Mosby Assess Test, Arnett Development Test, Health Education Services Incorporated Exit Exam, and Educational Resources, Incorporated Pre-RN Examination); number of graduates of the program; program policies on absenteeism, grading scales, and repeating nursing courses; faculty to student ratios in the clinical courses; percentage of faculty turnover from one year to the next; percentage of part-time faculty; faculty educational levels; years of full-time teaching experience per faculty member; years of faculty nursing experience and percentage of faculty holding national certification in teaching areas. Analysis was performed using descriptive statistics and Analysis of Variance (ANOVA). ANOVA is an appropriate technique for determining significant differences of means of two groups (Campbell & Stanley, 1965). This was accomplished by categorizing the data by program, by associate degree (two year) or baccalaureate (four year) status, and by whether the pass rate was above or below the rate established by the WVBOE as compared to the national average for each year of the ten-year period.

Additionally, multiple regression analysis of the data was determined using SPSS. This technique was appropriate, because the investigator was to predict or analyze scores on one dependent variable by combining the predictive power of multiple independent variables (Campbell & Stanley, 1965). In this case the investigator was interested in which independent variables predicted higher pass rates on NCLEX-RN.

CHAPTER 4

Results

Presentation and Analysis of Data

The purpose of the study was to investigate the relationships between mean program scores on standardized pre-graduation nursing examinations, program attendance policies in classroom and the clinical component, program grading scales, policies on repeating nursing courses, and the percentage of faculty holding national certification upon the pass rates for graduating classes on the National Council Licensure Examination for Registered Nurses (NCLEX-RN). This chapter includes the findings of the data and describes how the data were entered and processed. It also includes descriptive statistics and a review of findings as they relate to the research questions and hypotheses.

Descriptive Statistics

The population of this study consisted of nineteen undergraduate nursing programs preparing graduates for entry into practice as registered nurses during a period of ten years. This was the total number of nursing programs in existence in West Virginia during the study period. There were nine two-year programs leading to the associate degree**,** one hospital program leading to a diploma, and nine four-year programs leading to a bachelors degree in nursing. After 1997 the hospital diploma program became an associate degree program, changing the previous number to ten associate degree programs, zero diploma programs, and nine bachelors programs. One program included in the study opened during the period from 1991 to 2000, so had only graduates from six years from 1994 to 2000. Eight programs were in private

institutions while the remaining eleven programs were in public institutions of higher learning.

Size of nursing programs was determined by the number of graduates per year. This ranged from seven graduates to 154 graduates. The latter was a total number of students graduating from all the campuses of one institution. Late in the study period the graduates of these programs were listed separately and thus showed smaller numbers for the parent institution. The mean class size was 43.6 for the 187 graduating classes in the ten-year period.

Clinical teaching ratios ranged from one instructor per 4.5 students to one instructor per 11 students. The mean number of students taught by a clinical instructor was 8.49 students for the ten year period. It is possible that these ratios could have included community settings rather than exclusively hospital settings. It should be noted that the state of West Virginia mandates that there be no more than eight students per instructor in the clinical area.

Pre-graduation comprehensive standardized test results were reported by class on the annual report to the West Virginia Board of Examiners for Registered Professional Nurses for only a three year period from 1998 to 2000. These consisted of the Mosby AssessTest Unsecured, Health Education Systems Incorporated (HESI) Exit Exam, the Educational Resources Incorporated Pre-RN Exam, and the Arnett Computer Adapted Test. In order to compare the scores, the researcher ranked the mean score on the class by comparing it with the national average for all students taking the examination that year. Table 1 shows how numerical codes were determined for the variable of pre-graduation standardized achievement test scores.

Table 1

Numerical Coding for Graduating Class Average Score to National Average Scores on Comprehensive Pre-Graduation Standardized Examinations 1991-2000

Table 1: Numerical Coding for Graduating Class Average Score to National Average Scores on Comprehensive Pre-Graduation Standardized Examinations 1991-2000

Comparison to National Average	Numerical ranking assigned
21 - 25 % above	10
16 - 20 % above	9
6 - 10 % above	8
1 – 5 % above	7
at national average + or – 0.4 %	6
1 -5 % below	5
6 – 10 % below	4
11 – 15 % below	3
16 – 20 % below	2
21 – 25 % below	1
Mean coding score of all classes	6.73

It should be noted that comprehensive pre-graduation tests were not used by all the programs in the study. For individual tests, the numbers were very small in comparison to the total 187 class years. The mean ranking for the 40 total class years

from 1998 to 2000 was 6.73. This translates into a mean score near the national mean to approximately 1 % above the national average for the pre-graduation examinations from 1998 to 2000.

Pass rates for graduating classes in the state of West Virginia on the NCLEX-RN ranged from 46 % to 100 %. The mean pass rate for all classes in the nineteen programs during the decade was 84.89 %. These figures were compared to the national pass rate ranging from 83.84 % to 93 % with a national average of 86.93 % for the decade. This is higher than the mean West Virginia pass rate of 84.89 %. The West Virginia pass rate was therefore higher than the national average pass rate from 1991-2000. **(**See Appendix C: West Virginia Schools of Nursing Pass Rates.)

Total number of faculty per program per year ranged from 2.5 to 63.7 faculty members. The latter number was a total of all nursing faculty teaching at all campuses of a single parent institution. A mean of 15.4 faculty members represented a headcount of full and part-time faculty for the decade. In terms of part-time faculty, the range per graduating class year was 0 % to 69.1 %. The mean percentage of part-time faculty for all programs during the ten year period was 21.86 %; therefore, a little more than one-fifth of the nursing faculty was part-time during the study period. (See Table 2.)

Table 2

Composition of Faculty by Full-time and Part-Time Status 1991-2000

	Part-time	*Full-time*
Range	*0 – 69%*	*0 – 100 %*
Mean	*21.86%*	*79.14 %*

New faculty (those not named in the previous year's annual report to the West Virginia Board of Examiners for Registered Professional Nurses) ranged from 0 to 78.3 % with a mean of 20.9 % for all classes from 1991 to 2000. This meant that approximately one-fifth of the nursing faculty in West Virginia nursing programs were new to the program in which they were teaching.

It was also possible to determine the composition of the nursing faculty by rank. Instructors ranged from 0 to 100 % with a mean of 16.7 % for the ten years. It should be noted that the program consisting solely of instructors was a diploma program based in a private hospital. The traditional ranking system used in collegiate institutions was not used at this hospital program. Assistant professors ranged from 0 to 100 % with a ten-year average of 26.39 %; therefore, over one-fourth of the faculty carried the rank of assistant professor. The range for the percentage of associate professors was from 0 to 100 % with a mean of 20.9 % over ten years. Those with rank of professor ranged from 0 to 42.4 % with a ten-year mean of 10.29 %. (See Table 3.)

Table 3

Composition of Faculty by Rank in West Virginia Nursing Programs 1991-2000

	Instructor	Assistant Professor	Associate Professor	Professor
Range	0 – 100 %	0 – 100 %	0 – 100 %	0 – 42.4 %
Mean	16.7 %	26.39 %	20.9 %	10.29 %

Faculty teaching experience was divided into levels of less than one year, one to three years, four to six years, seven to nine years, and ten to 19 years, . The smallest mean percentage was found in the novice faculty with 4.77 % having less than a year of teaching experience. There was a mean of 4.77 % with less than one year, 22.35 % with one to three years, 15 % with four to six years, 9.95 % with seven to nine years, 30.96 % with 10 to 19 years, and 12.3 % with 20 to 29 years of teaching experience, and 3.7 % with 30 or more years of experience teaching nursing. To summarize, the greatest number (nearly one-third) of the nursing faculty in West Virginia during 1991-2000 were experienced faculty with 10 to 19 years of experience teaching nursing. **(**See Table 4.)

Table 4

Composition of Faculty in Years of Teaching Experience in West Virginia Nursing Programs 1991-2000

	Mean
Less than 1 year	4.77 %
1 - 3 years	22.35 %
4 - 6 years	15.02 %
7 - 9 years	9.95 %
10 - 19 years	30.96 %
20 - 29 years	12.3 %
30 years or more	3.7 %

In terms of clinical nursing service experience outside of teaching, 1.6 % had less than one year work experience as a registered nurse while 11.59 % had one to three years of nursing experience. The mean for those faculty having four to six years nursing experience was 18.93 %; 19.48 % with seven to nine years, 36.29 % with ten to 19 years, 9.19 % with 20 to 29 years, and 2.55 % with at least 30 years. To summarize, the greatest number of faculty (36 %) were experienced nurses with 10 to 19 years clinical nursing experience outside of teaching. (See Table 5.)

Table 5

Composition of Faculty in Years of Clinical Nursing Experience in West Virginia Nursing Programs 1991-2000

	Mean
Less than 1 year	1.6 %
1 - 3 years	11.59 %
4 - 6 years	18.93 %
7 - 9 years	19.48 %
10 – 19 years	36.29 %
20 – 29 years	9.19 %
30 years or more	2.55 %

The educational preparation of the faculty was determined by the highest degree held by each of the faculty in the program per year of the study period. There was 0.46 % without a bachelor's degree in nursing, 0.15 % with a bachelor's in nursing, 18.89 % with a non-nursing master's degree, 30.97 % with a master's degree in nursing, 9.19 % with a non-nursing doctorate, and 3.71 % with a doctoral degree in nursing. It should also be noted that a mean of 19.6 % of faculty were enrolled as graduate students and pursuing a higher degree in nursing. In summary, the majority **(**58 %) of nursing faculty from 1991 to 2000 had a master's degree in nursing. Nearly 75 % had master's and doctoral degree**s. (**See Table 6.)

Table 6

Composition of Faculty by Educational Preparation (Highest Degree Held) in West Virginia Nursing Programs 1991-2000

Highest Degree	Mean
Pursuing higher degree	19.56 %
Less than bachelors	0.46 %
Bachelors (non-nursing)	0.15 %
Bachelors in nursing	18.89 %
Masters (non-nursing)	4.43 %
Masters in nursing	58.16 %
Doctorate (non-nursing)	10.85 %
Doctorate in nursing	5.97 %

Also, a mean of 26.1 % of the total faculty reported that they held a national board certification through such boards as the American Nurses Credentialing Center. It should be noted that this is not a teaching certification but rather a certification for a specialty area of nursing. Of the faculty teaching the graduating class during their final year in their programs, 27.46 % held national board certification. This implied that slightly greater than one-fourth of the faculty were board certified over the ten year period.

A summary of descriptive statistics showed the following composite picture of the average nursing program during the ten-year period. The typical graduating class consisted of 43.6 students who scored at the national average on pre-graduation comprehensive standardized examinations and whose pass rate on the NCLEX-RN was 86.93 %. The typical faculty was composed of a total of 15.4 educators of whom 22 % were part-time, 78 % were full-time, 21 % were new to the faculty (not named in the previous year's annual report), and 79 % were not in their first year at the program, had the rank of assistant professor, had 10 to 19 years teaching experience, had 10 to 19 years of additional clinical nursing experience, had earned a master's degree in nursing, and nearly 20 % were currently enrolled in a higher degree program. Approximately one-fourth of the faculty held national board certification in their specialty fields of nursing. Deans, directors or program chairs were only counted in the previous statistics if they were listed as having teaching responsibilities in classroom or clinical according to the annual report.

Of the questionnaires mailed to the deans, directors or program chairs of the 19 nursing programs, 15 were completed and returned by mail to the researcher. Follow-up was conducted by phone, regular mail and electronic mail, resulting in a return rate of 78.95 %.

Data Entry

Data were collected from two sources. These were the annual reports at the West Virginia Board of Examiners for Registered Nurses from each nursing program and the surveys returned by deans, directors and program chairs from the nursing programs studied.

Data were first entered manually into a spreadsheet using Microsoft Excel. Data were visually screened by the researcher to verify accuracy between the data collection tools and those appearing on Microsoft Excel. These data were presented in such a way that each row in the table represented one graduating class by year for each year of the decade for each program studied. Later these data were transferred by a member of the researcher's dissertation committee into SPSS for quantitative analysis.

Statistical Analysis of Data

Analysis of data was performed using SPSS. Analyses of Variance (ANOVA) were then performed to determine differences in means between and within different graduating classes in respect to each of the independent variables. Multiple regression analysis was performed to determine predictability of variables to pass rate on NCLEX-RN. Additionally, correlations were performed to determine relationships between selected independent variables and pass rates on NCLEX-RN.

Major Findings

Findings of this study are presented in respect to each hypothesis. Significant differences were determined at a level of .05 alpha for four of the 12 hypotheses.

Hypothesis 1. *The higher the mean of scores of a graduating nursing class of a nursing program on pre-graduation standardized achievement tests, then the higher the average pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.* Four different standardized comprehensive pre-graduation examinations were utilized by schools

during the study period. These were the Mosby AssessTest Unsecured, Health Education Systems, Incorporated (HESI) Exit Exam, the Educational Resources Incorporated Pre-RN Exam, and the Arnett Computer Adapted Test. Because there were four different standardized tests utilized, the researcher compared the mean score of the class to the national average for that year on the test. In this way it could be seen how each graduating class compared to the national average and results could be compared regardless of the test utilized.

Table 7

One-way Analysis of Variance for Pre-Graduation Examination Scores and Pass Rate on NCLEX-RN

ANOVA

NCLEX-RN

	Sum of Squares	df	Mean Square	F	Significance
Between groups	1549.497	9	172.166	1.899	.091
Within groups	2720.091	30	90.670		
Total	4269.588	39			

significant ($p<.05$): no significance found

Regression analysis was also performed to determine whether the individual pre-graduation standardized examination predicted pass rate on NCLEX-RN. Three of the tests, Mosby AssessTest Unsecured, Mosby AssessTest Secured, and HESI Exit Exam were not found to be significant predictors of NCLEX-RN pass rates. (See Tables 8, 9, and 10.) Since so few of the programs used the Educational

Resources Incorporated Pre-RN Exam or the Arnett CAT, there were not enough data to perform regression and determine significance.

It should be noted that mandatory reporting of standardized pre-graduation test scores was only required from 1998 to 2000. Also, not all schools utilized a comprehensive pre-graduation test. This means that of the three years and total 57 possible class years in which a comprehensive score could be reported, only 40 actually were reported. Some programs utilized tests which were not comprehensive, such as a pediatrics or mental health nursing examination. They were not included in the results of this study.

Table 8

Regression Analysis of Predictor Pre-Graduation Examination Scores on Test # 1

Mosby AssessTest Unsecured and Pass Rate on NCLEX-RN

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Standard Error	Beta	t	Significance
(Constant)		66.666	17.950	3.714	.001
Std test score	.326	.281	.215	1.162	.255

a. Dependent Variable: NCLEX-RN

Table 9

Regression Analysis of Predictor Pre-Graduation Examination Scores on Test # 2 Mosby AssessTest Secured and Pass Rate on NCLEX-RN

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Standard Error	Beta	t	Sig.
(Constant)	58.677	34.407		1.705	.119
Std test score	.301	.567	.165	.530	.607

a. Dependent Variable: NCLEX-RN

Table 10

Regression Analysis of Predictor Pre-Graduation Examination Scores on Test # 3 HESI Exit Exam and Pass Rate on NCLEX-RN

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Standard Error	Beta	t	Significance
(Constant)	24.426	31.767	.832	.832	.452
Std test score	.723	.348	.720	2.075	.107

a. Dependent Variable: NCLEX-RN

Hypothesis 2. *The greater the size of the nursing program, then the higher the pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class*. Size of the program was reported as number of graduates each year. The mean squares between classes were 106.688 and within groups were 94.550. A one-way ANOVA yielded an F ratio of 1.128 with a level of significance of .282. No significant relationship was found between the two variables**,** size of the nursing program and pass rates on NCLEX-RN. (See Table 11.)

Table 11

One-way Analysis of Variance for Program Size and Pass Rate on NCLEX-RN

NCLEX-RN	ANOVA				
	Sum of Squares	df	Mean Square	F	Significance
Between groups	7681.40	72	106.688	1.128	.282
Within groups	10305.913	109	94.550		
Total	17987.453	181			

significant (p<05): no significance found

Hypothesis 3. *The stricter the attendance policy for the classroom, then the higher the pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.* Policies on classroom attendance were classified as follows: no written policy or penalty to students for absences; classroom attendance encouraged but not monitored; classroom grade reduction for specified number of absences; awarding of bonus points for not missing classes; or no

program policy existed but varied from course to course at the discretion of each professor. Strict attendance meant that attendance was mandatory and that absences resulted in a grade reduction. The mean squares between the classes were 284.946 and within classes were 94.282. A one-way ANOVA yielded an F ratio of 3.022 with a level of significance of .002. This shows that there was a significant difference between the variables of strict classroom attendance policy and the pass rate of the graduating class on NCLEX-RN. (See Table 12.)

Table 12

One-way Analysis of Variance for Classroom Attendance Policy and Pass Rate on NCLEX-RN

NCLEX-RN	ANOVA				
	Sum of Squares	df	Mean Square	F	Significance
Between groups	2564.515	9	284.946	3.022	.002
Within groups	14048.021	149	94.282		
Total	16612.536	158			

*significant (p<.05)

Hypothesis 4. *The stricter the attendance policy for the clinical area, then the higher the pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.* The data were classified as follows: no written policy or penalty to students for being absent from clinical; no clinical absences permitted; no clinical absences permitted, but students allowed to make up

clinical time with the instructor's permission; failure of the clinical portion of the if specified number of absences attained. If the program policy was not classified by any of the previous choices, then a copy of the policy was to be attached to the survey. As in Hypothesis 3, strictness referred to a clinical attendance policy in which absences could result in grade penalty**.** The mean squares between the classes were 325.441 and within classes were 102.478. A one-way ANOVA yielded an F ratio of 3.176 with a level of significance of .016. This shows that there was a significant difference between the variables of strict clinical attendance policy and the pass rate of the graduating class on NCLEX-RN. (See Table 13.)

Table 13

One-way Analysis of Variance for Clinical Attendance Policy and NCLEX-RN

NCLEX-RN	ANOVA				
	Sum of Squares	df	Mean Square	F	Significance
Between groups	1301.764	4	325.441	3.176	.016
Within groups	14756.855	144	102.478		
Total	16048.618	148			

*significant (p<.05)

Hypothesis 5. *The higher the grading scale by percentage score designated by a program for a letter grade, then the higher the pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.*

Grading scales were coded on a scale of 1 to 5 according to the grading scale reported by the programs administrators on the survey mailed to them. A code of 1 meant that the grading scale required the highest percentage grades to pass the course. An 80 % was the lowest passing percentage for Code 1. In one program this was designated as a B which was the lowest letter grade a student could earn to remain in the program. All the other programs required a C as the minimum passing grade. Another program encoded with a 1 used a similar scale but designated the 80 % as the lowest C. A minimum of C was required to pass. Programs assigned a 2 required at least a 78 % for the lowest C. A code of 3 was assigned to programs with the approximately the following grading scale: A=91-100; B=83-90, C=75-82 %. A code of 4 was assigned to programs with approximately the following grading scale: A=90-100, B=80-89, C=75-79 %. The lowest grading scale was assigned a 5 which was the following: A=90-100, B=80-89, C=70-79 %. The mean squares between the groups were 189.928 and within groups were 103.482. A one-way ANOVA yielded an F ratio of 1.835 with a level of significance of .125. This indicates that there was no significant difference between the variables of grading scale and the pass rate of the graduating class on NCLEX-RN. (See Table 14.)

Table 14

One-way Analysis of Variance for Grading Scale and NCLEX-RN

NCLEX-RN	ANOVA				
	Sum of Squares	df	Mean Square	F	Significance
Between groups	759.713	4	189.928	1.835	.125*
Within groups	16143.172	156	103.482		
Total	16902.886	160			

Not significant ($p<.05$)

Hypothesis 6. *The fewer the number of times students are allowed to repeat nursing courses within a program, then the higher the pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.* The mean squares between the classes were 562.489 and within classes were 99.279. A one-way ANOVA yielded an F ratio of 5.666 with a level of significance of .004. This shows that there was a significant difference between a fewer times that students are allowed to repeat nursing courses and the pass rate of the graduating class on NCLEX-RN. (See Table 15.)

Table 15

One-way Analysis of Variance for Repeating Nursing Courses and NCLEX-RN

NCLEX-RN	ANOVA				
	Sum of Squares	df	Mean Square	F	Significance
Between groups	1124.978	2	562.489	5.666	.004
Within groups	15487.558	156	99.279		
Total	16612.536	158			

*significant (p<.05)

Hypothesis 7. *The lower the rate of faculty turnover in a nursing program, then the higher the pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.* Regression analysis of faculty turnover to predictor of pass rate was performed. With an F ratio of .932, there was no significance at .336. This suggested that turnover of faculty did not affect the pass rate of the class on the NCLEX-RN**.**

Hypothesis 8. *The higher the number of years full-time teaching experience of nursing faculty, then the higher the pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.* Data were classified into the following groups according to years teaching experience in nursing as reported on annual report: six years or less, 10 to 19 years; 20 to 29 years, and 30 years or more. Significance (p<.05) was found for those with 30 or more years teaching experience. (See Table 16.)

Table 16

Regression Analysis of Predictor Years Teaching Experience (30 years or more) and Pass Rate on NCLEX-RN

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients		
	B	Standard Error	Beta	t	Significance
(Constant)	85.987	.816		105.356	.000
Exp-tch-6	-.296	.104	-.205	-2.840	.005

a. Dependent Variable: NCLEX-RN

Correlations were also performed to determine the relationship between the highest levels of teaching experience and pass rates on NCLEX-RN. A negative correlation was found between the variables indicating that the greater the percentage of faculty with at least 30 years teaching experience then the lower the pass rate of the class on NCLEX-RN. (See Table 17.)

Table 17

Correlations between 30 Years or More of Teaching Experience and Pass Rates on NCLEX-RN

		NCLEX-RN
Exper-teach 6	Pearson Correlation	-.205**
	Significance (2-tailed)	.005
	N	186

** Negative correlation found

Hypothesis 9. *The higher the number of years of clinical nursing experience of faculty outside teaching, then the higher the pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.* The data were classified by groups according to clinical nursing experience outside of teaching as follows: Data were classified into the following groups according to years teaching experience in nursing as reported on annual report: six years or less, 10 to 19 years; 20 to 29 years, and 30 years or more. For the purpose of statistical analysis, they were grouped again into groups of 0 to 6 years, 0 to 9 years, 10 to 19 years, greater than 20 years, and 30 years or greater. Significance ($p<.05$) was found for those with 0 to 6 years, 0 to 9 years, and 10-19 years clinical nursing experience. See Tables 18, 19, and 20.

Table 18

Regression Analysis of Predictor Years Clinical Nursing Experience of Faculty (10 to 19 years) and Pass Rate on NCLEX-RN

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Standard Error	Beta	t	Significance
(Constant)	81.547	1.645		49.559	.000
ec10	.068	.031	.161	2.208	.029

a. Dependent Variable: NCLEX-RN

Table 19

Regression Analysis of Predictor Years Clinical Nursing Experience of Faculty (0 to 9 years) and Pass Rate on NCLEX-RN

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Standard Error	Beta	t	Significance
(Constant)	88.304	1.741		50.718	.000
Ec4	-.068	.031	-.161	-2.208	.029

a. Dependent Variable: NCLEX-RN

Table 20

Regression Analysis of Predictor Years Clinical Nursing Experience of Faculty (0 to 6 years) and Pass Rate on NCLEX-RN

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Standard Error	Beta	t	Significance
(Constant)	88.029	1.287		68.419	.000
EC-least	-.098	.033	-.212	-2.940	.004

b. Dependent Variable: NCLEX-RN

Correlations were also performed for the levels of clinical nursing experience in which significance was found. Negative correlations were found for clinical experience of less than 10 years and pass rate on NCLEX-RN. Having 10 to 19 years of clinical nursing experience was positively correlated with pass rate on NCLEX-RN. (See Table 21.)

Table 21

Correlations between Years of Clinical Nursing Experience of Faculty and Pass Rates on NCLEX-RN

	NCLEX-RN		
Years	Pearson Correlation	Significance (2-tailed)	N
0-6	-.212**	.004	186
0-9	-.161**	.029	185
10-19	.161*	.029	185

* significant
**significant: negative correlation

Hypothesis 10. *The higher percentage of highest degree held by faculty, then the higher the pass rate will be on the NCLEX-RN for that graduating class.* Data were classified by degree as follows: doctorate in nursing, doctorate in other field, masters in nursing, and less than a master's degree in nursing. Regression analysis was performed with no significance for any degree. Results were as follows: for the doctorate, there was no significance at .325, for the master's of science in nursing (MSN) or above there was no significance at .372, and for any degree less than the MSN, there was also no significance at .372. This suggested that educational preparation of faculty had no effect on pass rates of graduates on NCLEX-RN.

Hypothesis 11. *The lower percentage of part-time faculty for a class, then the higher the pass rate will be on the NCLEX-RN for that graduating class.* Regression analysis was performed with no significance found ($p<.05$) by percentage of part-time

faculty. An F ratio of .580 showed no significance at .447. This suggested that the percentage of part-time faculty teaching in a program had no effect on pass rates of graduates on NCLEX-RN.

Hypothesis 12. *The higher the percentage of faculty possessing national certification by class, then the higher the pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.*

Regression analysis of national certification to predictor of pass rate was performed. With an F ratio of 3.293, there was no significance at .071. This suggested that being taught by nationally certified faculty did not make a difference in pass rates on NCLEX-RN**.**

Summary of Chapter

In summary, relationships between pass rates on the National Council Licensure Examination Registered Nurses (NCLEX-RN) for graduating classes over a ten-year period on all the nursing programs in West Virginia and selected independent variables were studied. Significant relationships were found between strict classroom attendance policy, strict clinical attendance policy, the number of times students were allowed to repeat nursing courses, years of teaching experience, years clinical nursing experience, and the dependent variable of pass rates of the graduating classes on NCLEX-RN from 1991-2000.

CHAPTER 5

Summary, Conclusions, and Recommendations

Presentation and Analysis of Data

This chapter addresses the summary, conclusions, and recommendations of the study. It contains a summary of the purpose, summary of the procedures, descriptive data, and major findings. The chapter ends with conclusions, implications, and recommendations for future research.

Summary of Purpose

The purpose of this study was to investigate the relationship between mean program scores on standardized pre-graduation nursing achievement tests, program attendance policies, program grading scales, policies on repeating nursing courses, percentage of faculty turnover, faculty degree attainment, faculty to student ratios, years of full-time teaching experience, years of clinical nursing experience outside of teaching, percentage of part-time faculty, percentage of faculty holding national certification, and success of graduates on the NCLEX-RN in nursing programs in West Virginia over a ten-year period. Findings in this study can be important to administrators and faculty in higher education, because pass rates on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) affect program and institution reputation, enrollment, and supply of registered nurses to the community during times of a critical nursing shortage (Buerhaus, 2000).

Summary of Procedures

The population of this study consisted of 19 undergraduate nursing programs preparing graduates for entry into practice as registered nurses during the ten year

period from 1991 to 2000. Of the 19 programs, there were nine two-year programs leading to the associate degree**,** one hospital program leading to a diploma which became a two-year program in 1997, and nine four-year programs leading to a bachelors degree in nursing. Eight programs were within private institutions while the remaining eleven programs were within public colleges or universities.

Two data collection tools were utilized by the researcher. The first was a nursing program survey for deans, directors and program chairs survey. The survey was designed by the researcher and mailed to the administrative heads of the 19 nursing programs. This survey gathered information about attendance policies in the classroom and clinical courses, grading scales, and policies on repeating nursing courses.

The second survey was a data collection tool developed by the research based on one developed by Stevens (1996). Data from each program were gathered including program size by graduating class, student-teacher ratios in the clinical component of courses, percentage of part-time faculty, years of teaching and clinical nursing experience, highest degree attained, and percentage holding national board certification.

Summary of Descriptive Data

Data were collected for each year as a class progressed through its curriculum within the program in which the class graduated. This represented 187 class years for 19 programs throughout the decade.

A summary of descriptive statistics showed the following composite picture of the average nursing program during the ten-year period. The typical graduating class

consisted of 44 students who scored at the national average on pre-graduation comprehensive standardized examinations and whose pass rate on the NCLEX-RN was 87 %. This was the average pass rate for the decade that was studied.

The typical faculty was composed of a total of 15 educators of whom 22 % were part-time and 78 % were full-time. Also, 21 % were new to the faculty; that is, they had not been named in the annual report to the WVBOE for the previous year; 79 % were not in their first year of teaching at the institution, because their names had appeared on the annual report from the preceding year. The typical nursing educator had a master's degree in nursing and was ranked as an assistant professor with 10 to 19 years teaching experience and had 10 to 19 years of additional clinical nursing experience. They had earned the masters degree in nursing. Nearly 20 % were currently enrolled in a higher degree program during the study period. Approximately one-fourth of the faculty held national board certification in their specialty fields of nursing.

Summary of Research Findings

The research findings are presented as they relate to each hypothesis previously stated in this study. Findings are also compared to those of other researchers presented in Chapters 1 and 2.

Hypothesis 1. *The higher the mean of scores of a graduating nursing class of a nursing program on pre-graduation standardized achievement tests, then the higher the average pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.*

No significant relationship was found between the two variables, mean scores on standardized pre-graduation comprehensive tests and pass rates on NCLEX-RN; therefore, the hypothesis was not supported. This refutes the finding in previous studies that the Mosby AssessTest (Foti & DeYoung, 1991; Fowles, 1992; Jenks, 1989; Myers, 1988) score was a significant predictor of pass rates on the NCLEX-RN. It should be noted that comprehensive pre-graduation tests were not used by all the programs in this study and mandatory reporting of scores on any standardized test administered to students by the school was only required to the West Virginia Board of Examiners for three of the ten years. For all the programs surveyed, this consisted of 40 class years out of the total 187 class years studied.

Hypothesis 2. *The greater the size of the nursing program, then the higher the pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.*

There was no significant relationship between program size (number of graduates per class year) and pass rate on NCLEX-RN; therefore, the hypothesis was not supported. It supported research done by Caldas (1993) and Stevens (1996) utilizing West Virginia programs. This refuted research done by Dell and Valine (1990) who contended that a large number of failures on NCLEX-RN occurred in programs with small numbers of graduates.

Hypothesis 3. *The stricter the attendance policy for the classroom, then the higher the pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.*

There was a significant difference between the variables of strict classroom attendance policy and the pass rate of the graduating class on NCLEX-RN; therefore, the hypothesis was supported. Although there were no studies found in the literature that examined attendance policies, Cole (1981) studied absenteeism and pass rates. The finding from the present study supports the finding from Cole (1981) in which policies on class attendance and absenteeism in West Virginia schools of practical nursing showed significant inverse relationships between absenteeism from class and performance on the state licensure examination.

Hypothesis 4. *The stricter the attendance policy for the clinical area, then the higher the pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.*

There was a significant difference between the variables of strict clinical attendance policy and the pass rate of the graduating class on NCLEX-RN; therefore, hypothesis four was supported. Again, this finding supported the Cole study (1981); however, the Cole study focused on classroom rather than clinical absenteeism among licensed practical nursing students.

Hypothesis 5. *The higher the grading scale by percentage score designated by a program for a letter grade, then the higher the pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.*

There was no significant difference between the variables of grading scale and the pass rate of the graduating class on NCLEX-RN; therefore, the hypothesis was not

supported. There were no studies in the literature examining relationships between grading scales and NCLEX-RN pass rates.

Hypothesis 6. *The fewer the number of times students are allowed to repeat nursing courses within a program, then the higher the pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.*

There was a significant difference between the fewer times that students are allowed to repeat nursing courses and the pass rate of the graduating class on NCLEX-RN; therefore, hypothesis six was supported. This supports the finding by Landry (1997) who found that repeating nursing courses was strongly correlated with failing the NCLEX-RN.

Hypothesis 7. *The lower the rate of faculty turnover in a nursing program, then the higher the pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.*

Findings of this study showed that turnover of faculty did not affect the pass rate of the class on the NCLEX-RN; therefore, the hypothesis was not supported**.** This variable was studied in response to a recommendation by Stevens (1996) that future research was needed in the area of faculty turnover and success of graduates on NCLEX.

Hypothesis 8. *The higher the number of years full-time teaching experience of nursing faculty, then the higher the pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.*

A significant relationship was found for those with 30 or more years teaching experience and pass rate of the graduating class on NCLEX-RN; however, there was a negative correlation between the variables indicating that the greater the percentage of faculty with at least 30 years teaching experience then the lower the pass rate of the class on NCLEX-RN. This shows that the hypothesis was not supported. Landry (1997) had also found no significant relationships between teaching experience of clinical faculty and NCLEX-RN in one university, but had found a negative correlation between average years of teaching experience and pass rates on NCLEX-RN.

Hypothesis 9. *The higher the number of years of clinical nursing experience of faculty outside teaching, then the higher the pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.*

Findings showed that a relationship between the two variables existed; therefore, the hypothesis was supported. Negative correlations were found for clinical experience of less than 10 years, and pass rate on NCLEX-RN. Having 10 to 19 years of clinical nursing experience was positively correlated with the pass rate on NCLEX-RN. This a refuted finding by Stevens (1996) in which there was no significant relationship between number of years clinical experience of the faculty and average pass rates on NCLEX-RN.

Hypothesis 10. *The higher the educational degree held by faculty, then the higher the pass rate will be on the NCLEX-RN for that graduating class.*

There was no significant relationship between the variables; therefore, the hypothesis was not supported. This did not support the findings by Davis, Dearman,

Schwab and Kitchens (1992) that doctorally prepared nursing faculty may not be prepared for teaching. Neither did it support the strong negative correlation found by Stevens (1996) that the higher the percentage of doctorally prepared faculty, then the lower the pass rate of graduates on NCLEX-RN. Neither did it support the finding by Landry (1997) that there was a negative correlation between educational preparation of classroom nursing faculty and pass rates on NCLEX-RN in one university.

Hypothesis 11. *The lower percentage of part-time faculty for a class, then the higher the pass rate will be on the NCLEX-RN for that graduating class.*

The hypothesis was not supported. There was no significance between part-time faculty and pass rates on NCLEX-RN. This did not support the finding by Stevens (1996) of statistically significant relationships between the percentage of part-time faculty and pass rates on NCLEX (Stevens, 1996). Neither did it refute the finding by Landry (1997) that there was no significant relationship between the percentage of part-time clinical faculty and NCLEX pass rates in one university.

Hypothesis 12. *The higher the percentage of faculty possessing national certification by class, then the higher the pass rate will be on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) for that graduating class.*

The findings of this study showed that there was no significance between the percentage of faculty holding national certification in their teaching areas and pass rates on the NCLEX-RN; therefore, the hypothesis was not supported. This showed that there was no relationship between the two variables. No studies had previously been found in the literature to examine whether faculty possessed national certification in their teaching areas.

Conclusions

Based on analysis of this research study, conclusions have been reached about the 19 nursing programs in West Virginia from 1991 to 2000. Each of the twelve independent variables is examined as they relate to the dependent variable, pass rates on the National Council Licensure Examination (NCLEX-RN).

Hypothesis One. There was no significant relationship between mean scores of graduating classes on standardized pre-graduation comprehensive tests and pass rates on NCLEX-RN. Although it could be concluded by the statistics that pre-graduation standardized testing does not make a difference in NCLEX-RN pass rates, this researcher cautions against doing so given the small numbers and use of different tests. Faculty and program administrators should not abandon their use of such testing based on these findings, because there are some points to consider before taking action.

As stated in Chapter 4, it should be noted that mandatory reporting of standardized pre-graduation test scores was only required from 1998 to 2000. Also, not all schools utilized a comprehensive pre-graduation test during this three-year period. This means that of the three years and total 57 possible class years in which a comprehensive score could be reported, only 40 truly comprehensive test scores were reported.

Another point to consider is the way the data were coded for this variable. Rather than attempt to compare class means on four different comprehensive standardized tests, the researcher divided each graduating class mean score by the national mean score for that year. The resulting quotient was then assigned a

numerical code to indicate a percentage range that the score deviated from the national mean. The differences between the numerical codes represented a range of approximately five percentage points.

It is the belief of this researcher that the codes should have been assigned for only one percentage point; therefore, a one-way ANOVA was performed again using the aforementioned coding. The level of significance was .003 (significance $p<.05$) between the groups (NCLEX pass rate and performance on standardized achievement tests).

Additionally, correlations were performed between the two groups. The Pearson correlation was .460 showing a significant relationship of .003 for a two-tailed sample for the 40 class years. The correlation was significant at the .01 level.

This reflected more accurately how the graduating class scores related to each other and showed a significant relationship between NCLEX-RN pass rates and pre-graduation standardized test scores. Performing well on a comprehensive pre-graduation achievement test generally indicates to the student and faculty that the graduate will do well on the NCLEX-RN.

Hypothesis Two. Program size does not predict performance on the licensure examination. This finding supported that found by Stevens (1996) in West Virginia from 1985 to 1994. In contrast, this refuted research by Scheck, Kinicki and Webster (1994) in which large business classes negatively student outcomes when compared to smaller courses.

A small graduating class would seem to have the advantage of personal attention from the faculty. Conversely, students in large graduating classes would

seem to be at a disadvantage due to the lack of personal attention; however, the findings do not support these beliefs.

Nursing cannot be compared directly to business classes, however, due to the fact that even students in large classrooms are divided into small clinical groups. Currently the West Virginia Board of Examiners for Registered Professional Nurses mandates that nursing programs adhere to the one to eight teacher-student ratios. The findings of this study did not support the findings by Dell and Valine (1990) in which programs with smaller numbers of graduates had large numbers of failures on NCLEX-RN. Small graduating classes have the disadvantage of their pass rates being affected statistically by even one or two failures. Even three failures in a graduating class size of ten results in a pass rate of 70 % which can result in a program in West Virginia being placed on provisional accreditation status.

Hypothesis three. There was a significant relationship between mandatory classroom attendance policies and pass rates on NCLEX-RN. This suggested that graduates of programs that required students to attend class performed better on the NCLEX-RN than those that did not require students to attend classes. Faculty within some nursing programs in West Virginia have made class attendance optional except during testing in the belief that students could learn independently without attending class. Also, some nursing courses are taught entirely through an electronic medium in some programs. This finding suggests that there is a benefit derived from being present in the classroom.

Hypothesis Four. There was a significant relationship between mandatory clinical attendance policies and pass rates on NCLEX-RN, suggesting that attending

clinical positively affected pass rates. This supports the research by Cole (1981). Not missing the actual hospital or clinical agency experience and actual student-client contact and making up actual experiences missed assist the student in developing critical thinking and decision-making skills.

Hypothesis Five. There was no significant relationship between having a high program grading scale and pass rates on NCLEX-RN. Historically, there has been a "weeding out" attitude by nursing faculty especially in the early nursing courses. Programs in the study set their grading scales from 90 to 94 % as the lowest A, from 80 to 87 % as the lowest B, and from 70 to 80 % as the lowest C. A professor could construct tests which were easy or difficult or grade on a curve which would leave the professor much room to manipulate the grades. Grading scales did not predict pass rates in West Virginia schools of nursing during the study period.

Hypothesis Six. There was a significant relationship between the number of times that students were allowed to repeat nursing courses and pass rates on NCLEX-RN. Students who fail nursing courses are considered at risk of failing NCLEX-RN, although most programs allow students to fail one nursing course within the program. These students often require special assistance to promote success in the program and NCLEX-RN.

Hypothesis Seven. There was no significant relationship between the percentage of faculty turnover from one year to the next and pass rates on NCLEX-RN. It would seem that consistency of the faculty from year to year within a program would positively influence student learning and outcomes such as NCLEX-RN. Having different faculty teach courses from year to year in a program would

seem to have a negative outcome. This would lead the reader to ask why there would not be a relationship between the two variables. New faculty orientation, mentoring of new faculty, and a positive institutional climate could be a factor influencing the degree to which students are prepared for NCLEX-RN.

Hypothesis Eight. This did not support findings of the 1996 Stevens study in which the greater the number of years of teaching experience had a significant relationship with the pass rates on NCLEX-RN. The Stevens study suggested that the more teaching experience an educator had that the better the NCLEX-RN pass rates would be.

In the present study, there was no significant relationship between years of teaching experience and pass rates on NCLEX-RN until 30 years of teaching experience had been attained. At that point, the relationship was significant; however, there was a negative correlation between the variables. The higher the percentage of faculty with 30 or more years teaching experience, then the lower the pass rate was on NCLEX-RN. This suggests that there is a point when teaching effectiveness and student outcomes are hindered by longevity of the faculty perhaps due to failure to stay current on new information, technologies, and teaching innovations. Effects of the aging process could also inhibit teaching effectiveness.

Hypothesis Nine. There was a significant relationship between the number of years of clinical nursing experience of faculty outside teaching and pass rates on NCLEX-RN for the graduating class. Having less than 10 years of clinical nursing experience outside teaching was found to be negatively correlated with pass rates

while having between 10 and 19 years experience positively correlated with pass rates.

This finding suggests that experienced nurses who are also nursing educators positively affect the pass rates of the students on the licensure examination. An educator who can apply experiences from years of working as a nurse can enhance teaching in the classroom more than one who has little or no experience in the clinical area. This refuted findings by Stevens (1996) in which no relationship was found between the two variables in West Virginia schools of nursing.

Hypothesis ten. There was no significant relationship between the educational degree held by faculty and pass rates on NCLEX-RN for graduating classes. This did not support findings by Stevens (1996) in which there was a negative relationship between the percentage of faculty with doctorates and NCLEX-RN pass rates.

Although administrative personnel encourage nursing faculty in undergraduate baccalaureate programs to earn a doctorate, the highest degree of educational preparation does not make a difference in NCLEX-RN pass rates. It was concluded in Hypothesis 9 that the degree earned by faculty was less important than the number of years of clinical nursing experience outside of teaching as it related to performance of their graduates on NCLEX-RN.

Hypothesis eleven. There was no significant relationship between the percentage of part-time faculty and pass rates on NCLEX-RN for graduating classes. During the present study period of 1991 to 2000, the researcher noted schools of nursing receiving letters from the West Virginia Board of Examiners for Registered Professional Nurses expressing concern at the high percentage of part-time faculty

within the program. One program during the study period consistently utilized over 50 % part-time faculty although this was not the usual practice within the nursing programs.

The lack of a significant relationship between percentage of part-time faculty and pass rates on NCLEX-RN refutes the finding in the Stevens (1996) study in which the higher the percentage of part-time faculty then the lower the pass rates on NCLEX were. Stevens (1996) presented the dilemma that part-time faculty were considered a financial asset to an institution, because they did not receive a benefits package; however, they were considered to be a disadvantage in nursing programs and a factor contributing to the consistently low pass rates on NCLEX-RN in West Virginia during the years 1985-1994.

Hypothesis twelve. There was no significant relationship between the percentage of faculty with national certification and pass rate NCLEX-RN for that graduating class. Although having board certification in a specialty area of nursing would seem to be a positive factor in increasing NCLEX-RN pass rates, there are some points to consider.

For the majority of the time in this 10 year study, there was no consistency in the reporting of national certification of faculty. There was not a question about certification on the data sheet each nursing educator submitted to the WVBOE in the annual report for the program. During that time, some faculty entered this information in various places. It would have been possible for the educator to be board certified but not report it on the form, because this information was not specifically requested. There could have been a higher percentage of board certified faculty than what was

actually reported. During the latter portion of the study period, this problem was corrected.

Implications

American society is in the midst of a critical nursing shortage (Buerhaus, 2000). Factors contributing to this crisis are increased longevity of Americans with chronic illnesses, expanding need for acute specialty and ambulatory care outside traditional hospital settings, an aging nursing faculty which is not being replaced by younger counterparts and the failure of nursing programs to supply graduates to meet these demands.

The market looks to higher education to address the shortage by producing more nursing graduates. Furthermore, academia is pressured to increase enrollments of nursing students on a shrinking budget without additional faculty to teach students. This results in increased use of part-time faculty if they can be found or full-time faculty with excessive workloads.

Since nursing education administrators have little control over the aforementioned, they should attempt to manipulate variables predicting success on the National Council Licensure Examination for Registered Nurses (NCLEX-RN). This study has implications to the role of higher education administrators in seven functions defined by Gulick and Urwick (1969). These include planning, organizing, staffing, directing, coordinating, reporting, and budgeting (POSDCoRB).

In the present study, program variables predicting success on NCLEX-RN were mandatory attendance policies for both classroom and clinical courses. Given

the foregoing, nursing education administrators should direct faculty to adopt consistent program policies in which a significant portion of the course grade is earned through attendance. Evaluation plans should include criteria for periodic monitoring of the effectiveness of such policies and reporting this to the parent institution or state board of nursing.

Another implication for nursing education administrators is the limitation of the number of nursing courses which students are allowed to repeat. In the present study, programs that allowed the fewest number of nursing courses to be repeated had the highest pass rates on NCLEX-RN. This finding supports such policies and implies that administrators should direct faculty to continue or adopt such program polices on attendance.

Although not statistically found to be a predictor of NCLEX pass rate success in this study, administering pre-graduation standardized achievement tests will help faculty to identify students at risk of failing NCLEX-RN. Administrators should budget money to pay for such testing and encourage faculty to adopt program policies in which a significant portions of the course grades are earned from scores on the standardized tests.

Reasonable attempts should also be made to remediate at-risk students who have failed nursing courses and/or have earned scores that predict failure on the licensure examination. The nursing education administrator may need to coordinate with other college or university departments such as student support services in order to assist students with test-taking strategies.

Given that graduating classes with faculty teaching experience of at least 30 years had a negative relationship with NCLEX-RN pass rates in this study, nursing education administrators should bear this in mind. They should monitor teaching effectiveness of all faculty but particularly those with 30 or more years of experience. Faculty development programs should be encouraged in order to keep faculty abreast of new teaching technologies and strategies while maintaining vitality and effectiveness in teaching.

A statistically significant negative correlation was found between graduating classes taught by faculty with less than 10 years of clinical nursing experience and pass rates on NCLEX-RN and positive correlations between faculty with 10 to 19 years of nursing experience. This has implications to the nursing education administrator in terms of hiring (staffing) nursing faculty who have significant experience within the field of nursing if feasible. They should also encourage current faculty to practice nursing in their fields in order to stay abreast of new skills, technologies, and information.

Recommendations for further research

Analysis of the findings of this study leads to the following recommendations for further research:

1. Further research could be performed on the existing data on pre-graduation standardized achievement tests from this study to determine whether significant relationships exist between comparisons of the graduating class by national mean to NCLEX-RN pass rates. This could be performed by simply recoding the comparison codes by one percent intervals rather than five percent intervals. This would more

accurately reflect how the graduating class performed against the national mean for the pre-graduation test.

2. Research should be replicated for a five year period from 2001 to 2006 in West Virginia and surrounding states bordering West Virginia to study the relationships between pre-graduation standardized comprehensive examinations and NCLEX-RN pass rates. Most schools in West Virginia currently use these tests and are required to report results to the West Virginia Board of Examiners for Registered Nurses on their annual reports to the board.

3. Research should also be performed to study the relationships between other variables such as faculty salaries, rank, tenure status, and work loads and pass rates on NCLEX-RN.

4. Further research should study the correlation between the use of technology, such as interactive television and web-based courses, and pass rates on NCLEX-RN. Studies should determine what relationships exist between distance learning sites and pass rates on NCLEX-RN.

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APPENDIX A

Human Subjects Review Application

68 Woodcock Drive
Ona, WV 25545

February 6, 2001

Dr. Ernest Goeres, Associate Dean
College of Human Resources & Education
WVU
802 Allen Hall
Box 6122
Morgantown, WV 26506

Dear Dr. Goeres:

Enclosed is my application for Human Subjects Exemption Review. I passed my prospectus meeting on January 30 of this year and hope to defend by early May in order to graduate in August. Please let me know if you have any questions. My office phone is (304) 696-2637 (at Marshall) and e-mail is turner44@marshall.edu

Thank you for your time and help in this matter.

Sincerely,

Lynda F. Turner
Doctoral Candidate, Higher Education Leadership Studies

APPLICATION FOR HUMAN SUBJECTS EXEMPTION REVIEW

1. TITLE OF STUDY Predictors of Success of Graduates of West Virginia Nursing Programs on the National Council Licensure Examination for Registered Nurses

2. INVESTIGATOR(S) Lynda Frances Turner

3. MAILING ADDRESS 68 Woodcock Drive, Ona, WV 25545

4. TELEPHONE NO. (DAY) (304) 696-2637

5. BEGINNING/ENDING RESEARCH DATES 02/01 thru 05/01

6. PURPOSE OF RESEARCH

_____Classroom Requirement	_____Professional
_____Masters Thesis	__x__Doctoral Dissertation

7. This investigation involves (check those that apply):

___the use of education tests (cognitive, aptitude, diagnostic, achievement).
__x__survey or interview procedures (excluding children as subjects).
__x__information which would not place the subject at risk of criminal or civil liability if it became known outside the research.
__x__information which does not deal with sensitive aspects of the subject's own behavior, such as illegal conduct, drug use, sexual behavior, or use of alcohol.
_____interviewing or surveying any elected or appointed public officials or candidates for public office.
_____observation of public behavior where the investigator does not participate in the activities being observed.
__x__the collection or study of existing data, documents, records or specimens in such a manner that human subjects cannot be identified.
__x__procedures in which the subjects' anonymity is guaranteed.
_____children, when not recorded, when surveys or interviews are not used, when the investigator is not a participant in the activities being observed.
_____research involving college or university students in your classes with a questionnaire or survey instrument being administered by someone other than the instructor of record.
__x__research for which no consent or assent forms are used.
__x__research for which subjects are not audio taped (children) or filmed or video taped (children and adults).

8. Objectives of Study (if more space is needed, attach extra sheet):

~~To determine the relationship between the independent variable~~s (attendance policies, grading scales, repeating of nursing courses, faculty educational levels, per cent part-time and full-time faculty, faculty to student ratios, faculty turnover, years teaching experience, and national certification of faculty) and the dependent variable of pass rates on NCLEX-RN)

9. Age of human subjects: 18 +

10. Summary of procedures dealing with human subjects:

Examining data contained in annual report of programs of nursing in West Virginia as submitted to the West Vriginia Board of Examiners for Registered Nurses and data from program directors about program policies.

11. Description of risks to human subjects:

None

12. Description of method of recording data:

Data will be collected by this researcher from the annual reports to the WVBOI and from questionnaires completed by program directors, deans or chairs and recorded on the attached data collection tool developed by the investigator. Results will be recorded within the dissertation with anonymity of the nursing programs protected.

13. Attachments:

x Questionnaire/survey — x Cover letter/script

____ Test instrument — ____ Institutional letter of agreement/approval

****

I HAVE REVIEWED THE ABOVE INFORMATION AND RECOMMEND IT FOR EXEMPTION.

Researcher | Faculty Advisor | Department Chair

Other | Associate Dean | Date

****

H. S. #_____(Assigned by Dean's Office)

APPENDIX B

Human Subjects Exemption Approval

WestVirginiaUniversity
College of Human Resources and Education

February 9, 2001

MEMORANDUM

TO: Lynda Turner

FROM: Ernest R. Goeres
Associate Dean

RE: Human Resources & Education H.S. #2001-010

Title: "Predictors of Success of Graduates of West Virginia Nursing Programs on the National Council Licensure Examination for Registered Nurses"

Your Application for Exemption for the above-captioned research project has been reviewed under the Human Subjects Policies and has been approved. Attached is the original of your cover letter with the signed stamp of approval. This must accompany your survey or questionnaire.

This exemption will remain in effect on the condition that the research is carried out exactly as described in the application.

Best wishes for the success of your research.

cc: Deans Office
Student Advising and Records
Paul Leary, Advisor

Office of the Dean
802 Allen Hall
PO Box 6122
Morgantown, WV 26506-6122
Phone: 304-293-5703
Fax: 304-293-7565

APPENDIX C

Letter to Program Deans, Directors, and Program Chairs of West Virginia Nursing Programs

Educational Leadership Studies
West Virginia University
College of Human Resources and Education

APPROVED BY THE COLLEGE OF HUMAN RESOURCES & EDUCATION
DATE: 2/12/01
ERNEST R. GOERES

February 8, 2001

Dear Nursing Dean, Director or Program Chair:

I am a doctoral candidate in the cooperative higher education leadership studies program through West Virginia University and Marshall University. My dissertation is entitled "Program Predictors of Success of Graduates of West Virginia Nursing Programs on the National Council Licensure Examination for Registered Nurses 1991-2000." The purpose of my research is to meet the requirements for my dissertation. Some of the independent variables I am studying include program attendance policies, grading scales, and policies on the repeating of nursing courses; I will then determine their relationship, if any, to the dependent variable of program pass rates on NCLEX by graduating class year.

I assure you that you have the right not to participate in the study by not responding. Your participation in the study is voluntary. Also, your anonymity will be maintained.

If you choose to participate, I ask that you please take a few minutes to provide the data I am requesting. Please return the enclosed survey to me in the stamped, self-addressed envelope within two weeks. Thank you for your time and help.

Sincerely,

Lynda F. Turner, MSN, RN, CS
Doctoral Candidate
(304) 696-2637
Fax: (304) 736-2572
e-mail: turner44@marshall.edu

304 293-3707/3708 ○ 606 Allen Hall ○ P.O. Box 6122 ○ Morgantown, WV 26506-6122 .
Equal Opportunity / Affirmative Action Institution

APPENDIX D

Nursing Program Survey for Deans, Directors and Program Chairs

1. Program/ Institution
   _____
2. Type of Program: Associate ____ Baccalaureate ____
3. What is the grading scale for your nursing program? (Please indicate numerical percentage.) Please indicate any changes from the years 1991 to 2000.
   A: _____ to 100 %
   B: _____ to _____
   C: _____ to _____
   D: _____ to _____
   F: 0 to _____
4. Describe the policies of your nursing program by checking the response that most accurately describes the policies and by filling in the blanks if appropriate:
   A. **Attendance**
      Classroom/ theory
      _____ There is no written policy or penalty to students for being absent from class.
      _____ Class attendance is encouraged, but is not monitored.
      _____ Theory grades are reduced by ____ (indicate letter or %) for exceeding _____ absences during the semester.

      Clinical
      _____ There is no written policy or penalty to students for being absent from clinical.
      _____ No clinical absences are permitted.
      _____ No clinical absences are permitted, but a student may make up clinical time with the instructor's permission.
      _____ A student will fail the clinical portion of a course if the student misses more than _____ clinical hours during the semester.

   _____ None of the above choices describe our program's policy. The following statement summarizes the policy: (If possible, please attach a copy of your program's policy.)
   _____
   _____
   _____

   B. Repeating nursing courses
      _____ There is no written policy on the repeating of nursing courses.

_____ A student may be permitted to repeat a nursing course one time. _____ There is no limit on the number of nursing courses which may be repeated.

_____ A student may be permitted to repeat a nursing course one time. No additional nursing courses may be repeated.

_____ A student may be permitted to repeat a nursing course more than once. There is a limit of ____ nursing courses which may be repeated.

_____ None of the above choices describes our program policy on repeating nursing courses. The policy is summarized in the following statement: (Please attach a copy of your policy on the repeating of nursing courses.)

_____
_____
_____
_____

APPENDIX E

Data Collection Tool

Program/ Institution _____ Report Year: _____

Type: Associate ____ Baccalaureate _____

Number of students graduating _____

NLN Accreditation: Yes _____ No _____ Number faculty _____ PT % _____

Faculty Turnover: Number faculty named in last year's report _____
Number new faculty _____
Number faculty leaving _____

Academic Preparation of Faculty:
(Please indicate total numbers)

Doctorate in nursing _____
Doctorate (other) _____
MSN _____
Masters (other) _____
BSN _____
Baccalaureate (other) _____
Pursuing higher _____

Faculty rank (Number of each)

Unranked or other _____
Instructor _____
Assistant Professor _____
Associate Professor _____
Professor _____

Faculty to student ratio in clinical _____

Faculty teaching experience

Less than one year: _____
1 – 3 years _____
4 – 6 years _____
7 – 9 years _____
10 – 19 years _____
20 – 29 years _____
30 years or greater _____

Clinical Experience of Faculty:

1 yr or less _____ % _____
2– 3 years _____ % _____
4 – 6 years _____ % _____
7 – 9 years _____ % _____
10 – 19 years _____ % _____
20 -- 29 years _____ % _____
30 years + _____ % _____

Graduation Year: _____

Year of student in program

Year 1 _____
Year 2 _____
Year 3 _____
Year 4 _____
Mean _____

National Certification of Faculty in Teaching Area _____ %
NCLEX-RN: Number of grads writing _____ NCLEX Pass Rate _____ %

APPENDIX F

Letter from Marshall University Institutional Review Board

MARSHALL UNIVERSITY
www.marshall.edu

Office of Research Integrity
Institutional Review Board

July 14, 2003

Dear Investigator:

Periodically the Marshall University Human Protection Program, as part of the overall Quality Assurance/Quality Improvement Program, will survey human subject participants. The intention of the survey is to identify any problem the participant may have and to take corrective measures to resolve the problem.

The Office of Research Integrity is asking each investigator's cooperation in submitting a complete list of names and addresses of the participants enrolled in their studies to the ORI no later than August 8, 2003.

If you have questions regarding the survey or the submission of the participant list, please call the Office of Research Integrity.

Thank you.

Jack E. Terry, D.O., Ph.D.
Director, Office of Research Integrity

68 Woodcock Drive
Ona, WV 25545-9691
July 24, 2003

Jack E.Terry, O.D., Ph.D., Director
MU Office of Research Integrity
Institutional Review Board
401 llth Street, Suite 1300
Huntington, WV 25701

Dear Dr. Terry:

I am writing in response to your letter of July 14, 2003 requesting me to submit a complete list of participants enrolled in my research study. My study, "Predictors of Success of Graduates of West Virginia Nursing Programs on the National Council Licensure Examination for Registered Nurses 1991-2000," does not involve direct participation by human subjects.

I collected data for my study through two methods. The first was by reading annual reports submitted by each nursing program to the West Virginia Board of Examiners for Registered Nurses in Charleston. These are public documents available to anyone to read with the permission of the WVBOE. Data collection was completed in August, 2002. I recorded these data on the enclosed form: Appendix A: Data Collection Tool.

The second method was through the enclosed survey and letter which I mailed to the directors of each registered nursing program in the state of West Virginia in 2001. At the time I was a student in the cooperative doctoral program between WVU and Marshall University which was the reason that I used WVU letterhead. This is a list of all the programs in my study and to whom the survey was mailed:

Alderson-Broaddus College
Bluefield State College
College of West Virginia (Mountain State University)
Davis & Elkins College
Fairmont State College
Glenville State College
Marshall University
St. Mary's Hospital School of Nursing
Shepherd College
Southern West Virginia Community and Technical College
The University of Charleston
West Liberty State College
West Virginia Northern Community College
West Virginia University
West Virginia University Institute of Technology
West Virginia University-Parkersburg
West Virginia Wesleyan University
Wheeling Jesuit University

I have provided a copy of addresses and contact persons for each of these nursing programs. If you have further questions, please feel free to contact me.

Sincerely,

Lynda F. Turner, MSN, RN, CS
Candidate for Doctor of Education, Marshall University

Enclosures

APPENDIX G

Comparison of West Virginia to National Pass Rates on NCLEX-RN 1990-2000

COMPARISON OF WV TO NATIONAL PASS RATES ON NCLEX-RN FROM 1990 1999

*test plan change

YEAR	90	91	92*	93	94	95*	96	97	98*	99	2000	2001*
NATIONAL PASS RATE	92	91	93	91	90	91	88	88	85.02	84.79	83.84	85.53
WV PASS RATE	88	85	88	83	85	87	87	90	87.99	84.04	81.53	87.29
WV RANK	43/ 54	48/ 55	47/ 56	49/ 56	50/ 54	43/ 56	39/ 56	17/ 56	13/ 56	33/ 56	33/ 56	21/ 56
WV SCHOOLS MET NATIONAL AVERAGE	8	3	7	7	5	8	10	13	14	10	8	10
WV SCHOOLS 90% OR ABOVE	8	3	7	7	5	8	10	10	10	5	6	10
WV SCHOOLS MEETING PASS RATE STANDARD	-	-	-	-	-	-	-	-	15	15	14	15
NUMBER OF WV PROGRAMS	16	17	18	18	19	19	19	19	19	19	20	19

APPENDIX H

West Virginia Schools of Nursing Pass Rates on NCLEX-RN 1985-2000

					WEST VIRGINIA SCHOOLS OF NURSING NCLEX PASS RATES											
								PASS RATE STANDARD						78.6	78.43	77.56
BACCALAUREATE SCHOOLS	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**2000**
PROGRAM 1*	70	96	96	94	93	80	73	80	82	73	67	90	86	70.8	80.8	77.8
PROGRAM 2										83	76	85	97	88.5	77.3	80.8
PROGRAM 3						97	87	79	90	84	91	91	92	91.8	83	83.3
PROGRAM 4							80	88	85	95	86	92	100	88.9	76.9	72.4
PROGRAM 5							74	76	71	83	70	90	92	68.8	86.1	56.7
PROGRAM 6								46	85	76	90	86	86	80	85.2	100
PROGRAM 7	83	87	92	67	100	68	80	81	71	74	88	84	88	95.5	100	100
PROGRAM 8	73	84	79	62	87	91	57	100	73	50	75	82	87	93.3	100	57.9
PROGRAM 9	90	87	90	79	73	82	76	80	78	79	90	78	94	89.3	81.3	87.3
PROGRAM 10															75	81.82
ASSOCIATE SCHOOLS	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**2000**
PROGRAM 11	99	93	94	88	89	92	88	100	93	92	94	95	89	97.1	94	93.8
PROGRAM 12	62	85	80	78	59	83	75	77	47	79	77	91	95	91.2	82.4	94.1
PROGRAM 13	87	86	88	72	90	96	96	96	98	92	95	94	96	91.8	86.5	87.8
PROGRAM 14	90	90	98	96	99	95	92	100	93	100	97	93	100	100	96.1	90.9
PROGRAM 15	98	87	100	96	95	97	88	85	92	84	81	94	100	88.9	82.4	63.6
PROGRAM 16	81	80	80	89	70	70	81	88	74	84	90	86	82	90	94.3	96.2
PROGRAM 17	80	81	88	75	76	88	85	87	78	85	85	85	86	81.4	80	73.7
PROGRAM 18	87	95	80	77	86	90	83	92	82	91	91	91	88	87.5	75	82.5
PROGRAM 19	86	94	84	90	90	92	91	100	93	85	93	80	95	93	85.1	84
NATIONAL PASS RATE														85.02'	84.79	83.84
QUATTRO:WVSCHOOLS NCLEX PASS RATE 3.04																

*Program names removed to preserve confidentiality in study
From Annual Report of the West Virginia Board of Examiners for Registered Professional Nurses to the Governor of West Virginia 2002-2004

APPENDIX I

NCLEX-RN Pass Rate Standards

MEMORANDUM

TO: M. Sharon Boni, DNSc, RN
President, ADDNE, NEFWV

FROM: Laura S. Rhodes, MSN, RN
Executive Secretary

DATE: June 24, 1998

RE: NCLEX-RN Pass Rate Standards

##########

The West Virginia Board of Examiners for Registered Professional Nurses approved the NCLEX-RN Pass Rate Standards as follows:

1. The minimum standard for each school's pass rate will be 92.5% of the national pass rate average on the NCLEX-RN for first time candidates each calendar year.

2. Any time a school's NCLEX-RN pass rate falls below the minimum standard, that school must submit a plan of action to the Board.

3. If a school's NCLEX-RN pass rate falls below the minimum standard for two (2) of three (3) consecutive years, a school may receive provisional accreditation status. Consideration will be given to the statistical relevance of the NCLEX-RN pass rate of schools which have a graduation classes of less that twenty (20).

4. Periodic evaluation of this standard will occur every three (3) years.

If you have questions or wish to speak with me please contact this office.

APPENDIX J

Lynda Frances Turner

68 Woodcock Drive
Ona, WV 25545
(304) 736-9258
turner44@marshall.edu

Associate Professor
Marshall University
College of Health
Professions
Huntington, WV 25755

Education

Ed.D. Candidate, Doctor of Education in Higher Education Administration, Marshall University, Huntington, WV, 2005.

Ed.S., Education Specialist in Higher Education Leadership Studies, Marshall University, Huntington, West Virginia, 2003.

M.S.N., Master of Science in Nursing, West Virginia University, Morgantown, West Virginia, 1984.

B.S., Bachelor of Science in Nursing, Olivet Nazarene University, Kankakee, Illinois, 1978.

Professional

Associate Professor
Marshall University, College of Health Professions
2003 – present Marshall University Huntington, WV

Assistant Professor
Marshall University, College of Health Professions
1999 – 2003 Marshall University Huntington, WV

Instructor
Cabell Huntington Hospital, Education Department
1998 – 1999 Huntington, WV

Per Diem R.N.
St. Mary's Hospital
1997 – 1999 Huntington, WV

Associate Professor
Division of Health Sciences
1989 – 1997 The University of Charleston Charleston, WV

Per Diem R.N.
Memorial Division
1987 – 1994 Charleston Area Medical Center
Charleston,WV

Assistant Professor
Department of Nursing
1986 – 1989 Pikeville College Pikeville, KY

Director of Nursing
1982 – 1986 Man Appalachian Regional Hospital Man, WV

Part-time Instructor
Allied Health Professions
1981 – 1982 Hocking Technical College Nelsonville, OH

Staff R.N.
ICU/CCU
1978 – 1982 Doctors Hospital Nelsonville, OH

Staff R.N.
4 North
1978 – 1979 Cabell Huntington Hospital Huntington, WV

Professional Organizations Sigma Theta Tau International Nursing Honor Society