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Examining Kaplan Nursing School Entrance Exam for Student Success and Attrition: A Retrospective Review

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Examining Kaplan Nursing School Entrance Exam for Student Success and Attrition: A Retrospective Review

by

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Abstract

The purpose of this study is to determine what the relationship is between student performance on the Kaplan Nursing School Entrance Exam, academic success, and attrition. Nursing Undergraduate Retention and Success (NURS) Model by Marianne R. Jeffreys (2012) was the theoretical framework for a study. The population consisted of 94 BSN students at a southeast public university in North Carolina. An existing nursing student database was used to collect the data. The independent variables were Kaplan Nursing School Entrance Exam scores, including the composite score and subtest scores in math, science, reading, and writing. The dependent variable, academic success, was measured using earned grades in nursing courses during the first year in the upper division of the nursing program. The results of the correlational analyses showed that two of the independent variables were significantly correlated with academic success. Kaplan Score ($r_s = 0.32$, $p < .001$) and Science skill ($r_s = 0.37$, $p < .001$) were statistically significant with a weak positive correlation. The dependent variable, program completion, was used to measure using graduation status at the end of the five semesters. Two of the independent variables were significantly correlated with program completion. Kaplan Score ($r_s = 0.25$, $p < .017$) and Science skill ($r_s = 0.23$, $p < .025$) were statistically significant with a weak positive correlation. Math, reading, or writing skills were not statistically significant with academic success or program completion. Results of the correlational analysis showed a significant positive relationship between academic success and program completion ($r_s = .789$, $p < .001$). The attrition rates of 18-37% for each term was no different than the national average (Baum, Ma, & Payea, 2013).

Keywords: Kaplan Nursing School Entrance Exam, academic success, attrition

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CHAPTER I

Introduction

Student retention, progression, and attrition is a well-documented problem for nursing programs worldwide (Beauvais, Stewart, DeNisco, & Beauvais, 2014; Jeffreys, 2014; McKendry, Wright, & Stevenson, 2014). With the ongoing workforce shortage in the nursing profession, there is a need to prioritize strategies that will grow the number of working nursing professionals for today's current health care needs and the future. According to the U. S. Bureau of Labor Statistics (2015), the employment projection for registered nurses (RNs) from 2014-2024 are listed as one of the top growing occupations the United States (U.S.) with the workforce expecting to grow 16% from 2.8 million to 3.2 million by 2024. With limited seats available in pre-licensure nursing programs, improving student attrition rates is crucial for nursing workforce expansion.

Significance

In 2010, the Institute of Medicine released *The Future of Nursing,* a report calling for an increase in the proportion of nurses with a baccalaureate degree to 80% by 2020 (Institute of Medicine [IOM], 2010). Since the report's release, academic leaders and nursing programs across the nation have been working to meet the challenge to increase baccalaureate prepared nurses from 50-80%. In 2006, the National Center for Public Policy and Higher Education reported that about 58% of first-time, full-time college students completed a bachelor's of science in nursing (BSN) degree within six years of enrolling in college (Lacey Research Associates, 2008). The 2006-2008 aggregated attrition rate for students in the pre-licensure BSN programs was 75% (Lacey Research Associates, 2008). To meet the growing demand for baccalaureate prepared nurses, the

challenge to improve student retention in programs where there is limited clinical placements, strained resources, and faculty shortages is a high priority (Newton, Smith, Moore, & Magnan, 2007)

Currently, there are 26 baccalaureate of science nursing programs offered in the state of North Carolina (North Carolina Board of Nursing, 2016). Government initiatives have been created to increase the number of students in pre-licensure nursing education. In North Carolina, several undergraduate grants and scholarships have been instituted to help offset the cost of attendance and increase the nursing workforce in rural areas (College Foundation of North Carolina, 2016). Unfortunately, with the mass exodus of aging nurses and rising community health care needs, nursing programs are unable to expand capacity to meet the workforce demand for trained professional registered nurses (RNs).

To address student attrition in nursing programs, strategies that have been used include "selecting appropriate candidates for nursing programs, identifying at-risk students, developing strategies to facilitate learning and success, and preparing students for smooth entry into the nursing workforce" (Jeffreys, 2007, p. 407). Nursing students face the challenge of rigorous nursing training early in the program that may influence a student's ability to progress through the nursing program (Pence, 2011). Despite efforts made to improve student retention and attrition, nursing students who are unable to persist, voluntarily, or involuntarily leave the program (Jeffreys, 2007, 2012).

Problem Statement

A southeastern four-year public university offers both traditional and nontraditional pre and post-licensure nursing programs. In 2007, the North Carolina

Board of Nursing (NCBON) placed the university's pre-licensure Bachelors of Science in Nursing (BSN) program in a "warning status". As part of the compliance review, it was noted that the admissions process was not followed which led to students being admitted into the upper division of the program without completing the course requirements. Since inception of the program in 2004, graduating students of 2007 and 2008 had not met the threshold for the National Council Licensure Examination – Registered Nurse (NCLEX-RN) pass rate minimum of 85%. Consequently, in 2009, the university's Chancellor suspended new enrollment into the undergraduate pre-licensure nursing program until improvements in compliance with the NCBON and student success were demonstrated. As part of the remediation process, decisions were made to revise the admissions process to include academic outcomes as a determinant for student selection. The results of this study will provide empirical data to guide future strategies for plans and decision when designing student admission and selection criteria for its nursing programs.

Purpose

The ongoing shortage of nurses in the workforce call for research to determine variables and predictors of student attrition in nursing programs and strategies to improve program completion rates. Although several studies have been conducted to measure academic outcomes as a predictor of student success on the NCLEX-RN, there is very little research on measuring academic outcomes as a predictor of student retention and attrition.

The purpose of this research is to expand to the body of literature by examining correlations of academic outcome variables with student retention, progression, and completion of a nursing program. The goal of this study is to determine if performance

on the Kaplan Nursing School Entrance Exam is a good predictor of early academic success and student attrition in a pre-licensure baccalaureate nursing program.

Research Questions

1. What is the relationship between the Kaplan Nursing School Entrance Exam scores and first year nursing course grades?
2. What is the relationship between the Kaplan Nursing School Entrance Exam scores and student attrition rate in a pre-licensure nursing program?

Conceptual Framework

Several retention models have attempted to identify causative factors that influence student success and retention in "traditional" and "nontraditional" students (Bean & Metzner, 1985; Cabrera, Nora, & Castaneda, 1993; Tinto, 1987). One conceptual framework that has been developed with relevance specific to nursing education is the Nursing Undergraduate Retention and Success (NURS) Model by Marianne R. Jeffreys (Jeffreys, 2012). The NURS Model suggests that students deciding to persist or withdraw from nursing programs based on one or several variables. These variables include student profile characteristics, student affective factors, academic factors, environmental factors, professional integration factors, academic outcomes, psychological outcomes, and outside surrounding factors (Jeffreys, 2012). Because each nursing program has unique characteristics such as student, community, and faculty demographics, curriculum design, and administrative, faculty, and health community support, no single strategy can be deployed to address student retention and attrition globally.

The Nursing Undergraduate Retention and Success (NURS) Model posits multidimensional factors of inquiry for nursing education programs to identify at-risk students and strategies to overcome retention and attrition issues (Jeffreys, 2012). This study will use the academic outcomes component of the Nursing Undergraduate Retention and Success (NURS) Model to conduct a retrospective review of a pre-licensure BSN program admissions process through program completion to determine if using prescriptive Kaplan Nursing School Entrance Exam scores as a student selective criteria is a good predictor of early academic success and student attrition.

Definition of Terms

- *Academic outcomes* – represented by the student's nurse course grades and Kaplan Nursing School Entrance Exam scores
- *Attrition* – students ''dropping out'' of the nursing program (Jeffreys, 2012, p. 10)
- *Attrition rate* – The percent of students who dropout of the nursing program
- *Baccalaureate degree nursing student* – a student that attends a four year university to earn a Bachelor's of Science in Nursing degree
- *Dropout* – a person who stops going to a school, college, before finishing
- *Kaplan Nursing School Entrance Exam*– a test tool used to determine if students have the academic skills necessary to perform effectively in a school of nursing
- *NCBON (North Carolina Board of Nursing)* – the professional organization that monitors and accredits nursing programs in the state of North Carolina
- *NCLEX-RN (National Council Licensure Examination-Registered Nurse)* – a nationwide examination for the licensing of registered nurses
- *NCLEX-RN pass rate* – percent of student who passed the NCLEX-RN

- *Nursing Undergraduate Retention and Success (NURS) Model* – A comprehensive conceptual model illustrating the multidimensional process of undergraduate nursing student retention and success (Jeffreys, 2012)
- *Pre-licensure nursing program* – a degree program in nursing designed to prepare students who do not hold a license as a registered nurse for a professional nursing career
- *Program retention* – the continuous enrollment in a nursing program (part- or full-time) by taking the required courses sequentially until meeting the program's graduation requirements, possibly including courses repeated for previous withdrawal and/or failure (Jeffreys, 2012, p. 9).
- *Withdrawal* – when a student officially withdraws from a college course or courses due to personal and/or academic reasons (Jeffreys, 2012, p. 10).

Summary

As aging nurses leave the workforce and societal demands for health care increases, the U.S. is projected to experience a worsening nursing shortage of RNs. Decreasing student attrition in pre-licensure nursing programs is one approach to increasing the number of nurses in the workforce. Understanding the cause of attrition in nursing programs is essential to increasing the number of nursing student graduates and meeting societal demands for health care. Jeffreys NURS model will provide a framework for this study and provide insight into whether performance on the Kaplan Nursing School Entrance Exam is predictive of student success and persistence in the nursing program.

CHAPTER II

Literature Review

This research study will examine the predictability of cognitive variables on academic success for baccalaureate nursing students in a pre-licensure program. This chapter will describe assessment tools used to examine non-cognitive and cognitive variables on student attrition and review prior research related to student aptitude and student attrition. The keyword searches for this study included the following terms: nurse student attrition and aptitude. The ProQuest Nursing and Allied Health Source, Cumulative Index to Nursing and Allied Health Literature (CINHAL), Science Direct databases, and Google Scholar were used to locate research articles. Further discrimination was made to exclude studies not specific to health or medical programs.

Literature Related to Problem Statement

Much of the literature on nursing program attrition suggests that cognitive factors such as preadmission test scores, grade point average, prerequisite course grades, and nursing course grades strongly correlate with student success (Jeffreys, 2007, 2012, 2014; Newton et al., 2007; Seldomridge & DiBartolo, 2004). Some schools use academic outcomes as part of the admissions criteria. Standardized college entrance exams such as the Scholastic Aptitude Test (SAT) or the American College Test (ACT) are used to test the students ability to perform during the freshman year and are part of the preadmission requirements into the university. Nursing aptitude test such as the nurse entrance test (NET), Test of Essential Academic Skills (TEAS), and Kaplan Nursing School Entrance Exam are part of the requirements for pre-entry into nursing programs. High performance

in pre-nursing science and math courses have also been linked to academic success (Alden, 2008; Jeffreys, 2007).

Newton, et al. (2007) examined the significance of pre-admission GPA (pGPA) and TEAS scores and reported that scholastic aptitude and nursing aptitude are strong predictors of early academic success. The study sample consisted of 164 sophomore students admitted to a baccalaureate nursing program in a Midwestern state during the Fall and Spring semester. The mean TEAS composite score was 77.14 (*SD* = 7.19) and the mean cumulative pGPA was 3.29 (*SD* = 0.23). The regression model accounted for 35.9% ($F = 29.874$; $p < .001$) of the variance in first-semester GPA. The study showed that both the pGPA and TEAS were reliable predictors of first semester nursing program success.

Jeffreys (2007) studied nursing student progress and success by examining the relationship between student profile characteristics, academic outcomes, program completion length, licensure, and type of retention or attrition among a sample of 112 associate degree nursing students. The retrospective study examined a sample of students who entered the first clinical nursing course during the Fall or Spring semester of the 1997-1998 year. The pre-nursing grade point average (pGPA) was used to determine eligibility and ranking for admission into the clinical nursing courses. The average pGPA was 3.07, with a range of 2.53-4.00. The minimal acceptable pGPA for admission was 2.5 on a four-point scale. Educational entry characteristics (pre-nursing GPA, AP course grade, local credits, and transfer credits), were compared for type of retention and attrition. Correlation analyses indicated that the first nursing course grade, Medical Surgical Nursing I (MS1), was moderately correlated with pGPA

(Pearson's $r = 0.41$; $p = 0.00$) and Anatomy and Physiology (Pearson's $r = 0.23$; $p = 0.04$); no other significant correlations were noted between educational entry characteristics and other nursing course grades. The graduation rate was 75% with a mean of 5.43 semester and a median of 5.0 semester to graduate from first time enrollment in MS1. Comparative analyses of graduates and non-graduates showed a statistically significant difference with regard to age ($t = 2.741$; df = 110; $p = 0.007$), MS1 grades ($t = -3.678$; df = 104; $p < 0.001$); and transfer credits ($t = 2.270$; df = 110; $p = 0.025$). Graduates were younger, had less transfer credits and had higher pGPA and MS1 grades.

Newton and Moore (2009) studied the relationships between scholastic and nursing aptitude with student attrition of a BSN program and pre-NCLEX-RN scores among a sample of 94 full-time nursing students admitted to a Midwestern state-supported BSN program in the Fall of 2004. The TEAS and RN Comprehensive Predictor examination scores were used to measure nursing aptitude. Regression analysis indicated that scholastic aptitude was predictive of NCLEX-RN readiness $p = .015$. Pre-nursing grades less than 2.5 had a moderately strong negative relationship with pre-nursing scholastic aptitude ($r = -.424$) but were not related to long-term attrition or NCLEX-RN readiness. Nursing aptitude was not predictive of NCLEX-RN readiness $p = .329$. Regression analysis indicated that first semester nursing GPA was most predictive of NCLEX-RN readiness $p = .043$. First semester nursing success had a weak positive relationship with long-term attrition ($r = .314$) and NCLEX-RN readiness ($r = .275$).

A dissertation study by Hernandez (2011) explored the relationships between preadmission cognitive variables and nursing student program outcomes among 275

baccalaureate nursing students at a Midwestern university over six years. Preadmission GPAs and TEAS test results were used as predictive variables to test correlation of outcomes variables including benchmarks on ATI Fundamentals of Nursing and RN Comprehensive Predictor tests, failure of nursing coursework, persistence, academic dismissal, graduation, and passing NCLEX-RN on the first try. The mean GPA was 3.32 and the mean TEAS Composite score was 80.31%. Correlations, regressions, ANOVA and *t* tests were used to analyze data collected over six years. The results indicated that preadmission GPA correlate with student progression r = .10, $p < .001$. There was a strong positive correlation with TEAS results and student graduation; Science r =.29, $p < .0001$ and Composite r = .27, $p < .0001$. Students who had a high GPA maintained enrollment in the program and students who had higher Science and Composite scores on the TEAS test completed the program.

In another study, Herrera (2013) studied the relationship between academic and nursing aptitude with successful on time completion of the four semester clinical nursing program among 584 nursing students enrolled in a pre-licensure nursing program at Arizona State University in 2007 and 2008. Academic aptitude was measured using prerequisite course grades and nursing aptitude was measured using Nurse Entrance Test (NET) scores. Other measures included the number of prerequisite courses taken at four-year institutions, race/ethnicity, and gender. The correlational analysis and multiple regression indicated that specific prerequisite courses, race/ethnicity, and gender are predictive of completing the program in the prescribed four terms. NET math scores were negatively skewed with the lowest score earned was 68%, the highest score was 100%, mean 92.14, *SD* 5.735. NET reading scores were normally distributed with the grade

ranges from 60% to 94%, mean 75.62, *SD* 7.025. In this study, 93.8% of the 584 students completed the program in four terms. The logistic regression analysis showed no statistical significance for NET math $p < 0.272$ and NET reading scores $p < 0.891$. Six variables were statistically significant at the $p<.05$ level or below. The six variables include courses in Human Nutrition $p < 0.007$, Clinical Healthcare Ethics $p < 0.017$, and Human Pathophysiology $p < 0.032$; male students $p < 0.009$; Black students $p < 0.016$; and Hispanic students $p < 0.032$. The signs for the coefficients were negative for male students β -1.502, Black students β -2.323, and Hispanic students β -1.192 indicating these students are less likely to complete the program on time in the prescribed four terms compared to female students and all other races/ethnicities included in the study. There was a positive correlation with the courses in Human Nutrition B 1.03, Clinical Health Ethics β 1.34, and Pathophysiology β 0.748 indicating that as grades earned in these course increase by one level from a "C" to a "B" or "B" to an "A", students are more likely to complete the program on time within the prescribed four terms.

Underwood, Williams, Lee, and Brunnert (2013) investigated the predictive value of Elsevier's HESI Admission Assessment A^2as a predictor of student success within a BSN program among 184 students who were admitted between Fall 2008 to Spring 2010. The students were required to take four A^2 exams including reading comprehension, vocabulary and general knowledge, math, and Anatomy & Physiology. The study examined the relationship between the A^2 scores and final grades of the first three semester courses (NU301, NU302, and NU305). Correlation analyses of A^2 scores and final course grades indicated a significant positive relation $p \leq .01$. Higher A^2scores were predictive of higher final course grades in the first three semester nursing courses.

In an effort to increase retention, progression, and graduation amongst Hispanic nursing students, a study was conducted to identify academic aptitude predictors of nursing academic success in the first nursing course (Diaz, Sanchez, & Tanguma, 2012). The study used a sample size of 174 students attending a baccalaureate program in a culturally diverse public university. The exploratory study examined the predictive value of TEAS scores and PGPA on the success of students in their first semester academic nursing course. A binary logistic regression analysis was conducted using SPSS 16.0. The significance level was set at $p < 0.05$. Results of the forward conditional logistic regression indicated that the TEAS score (Wald statistic = 22.931, $p = 0.000$, Exp [B] = 1.188) was statistically significant to the model.

Hinderer, DiBartolo, and Walsh (2014) conducted a pilot study with a sampling of 89 students to explore the relationship between the HESI A^2 Exam and preadmission GPA, Science GPA, and nursing GPA and their predictive value relating to timely progression. The finding showed no relationship between the A^2 exam, preadmission GPA or Science GPA or timely progression. However, the A^2 exam was correlated with the nursing GPA and the NCLEX-RN success rate.

The Kaplan Nursing School Entrance Exam is a diagnostic assessment tool used to determine if students have the academic skills necessary to perform effectively in a school of nursing. The exam is a 91-question, online, multiple choice test that evaluates the basic reading, math, writing and science skills of students seeking entry into a nursing program leading to RN licensure (Sanders et al., 2012, p. 99). A research study in spring 2010 among 330 students from nine different nursing programs was conducted to explore the relationship between earlier exam scores and students dropping out of the nursing

program (Sanders et al., 2012). Correlation analyses was performed using previous admission test scores in Math, Reading, Science, Writing, Critical Thinking and overall test scores. Based on the results of the study, science exam scores was the only test score statistically significant r -.150, $p < .05$. Student who scored higher on the science portion of the exam were more likely to complete the nursing program. Kaplan suggests that more research is needed with a larger cohort.

Literature Related to Theoretical Framework

The NURS model proposes that voluntary and/or involuntary decisions to persist in a course or program of study occurs during and at the conclusion of each nursing course (Jeffreys, 2012). The NURS model is designed to appraise nursing student retention using multidimensional factors that affect undergraduate retention and success. The NURS model provides a theoretical framework for examining the relationship between admission criteria and performance in nurse courses. Three studies were found in the literature review that used the NURS model as a theoretical framework.

Pence (2011) studied the relationship between emotional intelligence, motivation, demographic variables, and retention among a sample of 390 first-year students who attended an associate degree nursing school in the state of Illinois in 2009. The Assessing Emotions Scale (AES) and the Motivated Strategies for Learning Questionnaire (MSLQ) were the instruments used for this study. There was a statistically significant difference in the mean scores for test anxiety, ($p = .012$) and control of learning beliefs ($p = .043$). Age, race/ethnic background, and school were predictors with retention. In contrast to previous literature reporting that emotional intelligence was predictive of retention, this study did not show a statistical difference at the ($p = .05$) level in emotional intelligence

as a predictor of retention. The implications of this study for nurse education suggest assessment of motivational factors early in the program to identify specific areas of weakness to direct remediation and counseling efforts, integrating support strategies for older student, and developing smaller communities within the institutional environment (Pence, 2011).

A second study using the NURS model as a theoretical framework set out to examine the impact of the professional integration factors on student persistence in a nursing program among 137 participating grant students between Fall 2008 and Spring 2010 (Fontaine, 2014). Jeffreys identified faculty advisement and helpfulness, professional events, memberships, peer mentoring-tutoring, encouragement by friends in class, and enrichment programs as professional integration factors. The grant funded the Northern Nevada Nursing Retention Program (NNNRP) services to provide enrichment activities to improve retention. Activities included a comprehensive orientation, learning communities, individualized academic plan, community nurse mentoring, counseling, peer tutoring, and career counseling. Student satisfaction with individual services were evaluated using a Likert scale questionnaire survey designed by the program staff. Graduating students rated their satisfaction level of agreement with statements on the scale. The nursing program's average overall six-semester retention rate after the NNNRP was implemented (71%) was statistically significant difference ($p = 0.048$) with the six semesters before NNNRP (61%).

In a dissertation study, Alden (2008) used the NURS model to study academic outcomes as a predictor of early academic success among 370 students attending a pre-licensure baccalaureate of science in nursing program at the University of North Carolina

Chapel Hill from 2001-2003. The dependent variables of this study were academic outcome and retention. The independent variables of this study were cognitive, non-cognitive, and demographic. The cognitive independent variables included cumulative GPA, science GPA, number of science credits, previous degree, reading comprehension, and math skill. The non-cognitive independent variable was stress. The demographic variables were age and ethnicity. The cognitive variables were previous educational factors except for the reading comprehension and math skills. The reading comprehension and math skills were tested using the NET exam prior to program entry. Results of the correlational analysis showed a significant positive relationship between early academic success and program completion (rs = .52, $p < .001$). A two-by-two classification table showed that 44 of the 56 students (78.6%) for whom graduation was delayed or denied were not successful during their first two semesters. There was a strong correlation with some independent cognitive variables and early academic success. The significant variables were math skill (rs = 0.27, $p < .0001$), reading comprehension (rs = 0.25, $p < .0001$), and science GPA (rs = 0.24, $p < .0001$) (Alden, 2008).

Strengths and Limitations of Literature

Most of the research on student retention and attrition noted a strong correlation associated with scholastic and nursing aptitude and early academic achievement. Withdrawals and dropouts due to weak scholastic ability while in the program cannot be examined in the late academic achievement. Therefore, the effects of pre-admission academic outcomes on students with weak scholastic aptitudes has been difficult to establish. Additionally, most of the research examines the relationship between academic factors and NCLEX-RN pass rates.

Minimal studies have been done using Jeffreys NURS model as a conceptual or theoretical framework for studying student nurse retention or attrition. Moreover, only one study has examined the predictive value of Kaplan exam scores on retention and there are no studies on the predictive value of the Kaplan Nursing School Entrance Exam on early academic success. More research is needed to expand the body of literature using Jeffreys NURS model and establish the validity and reliability of the Kaplan Nursing School Entrance Exam.

Summary

With the nursing shortages and limited nurse faculty to meet the increasing health care demands, nursing programs must make every effort to select candidates most likely to successfully complete the program. A review of literature on the predictive value of cognitive and non-cognitive variables for student success and retention have indicated that there is some correlation. However, limitations in much of the literature is that the results could not be generalized for all nursing populations.

Many schools of nursing have used scholastic aptitude and nurse aptitude test to determine student eligibility for program enrollment. This study will add to the body of literature on student retention and attrition in pre-licensure baccalaureate nursing programs and include the scope of findings on the predictive value of the Kaplan Nursing School Entrance Exam on student early academic success.

CHAPTER III

Methodology

This chapter provides an overview of the methodologies used to conduct this research study. The goal of this research study was to determine if the performance on the Kaplan Nursing School Entrance Exam is a good predictor of student academic success and attrition in a pre-licensure nursing program.

Research Design

This study was a quantitative, non-experimental, correlational research study using a cross sectional design. According to Polit and Beck (2014) research is categorized by when and how often data will be collected. This study collected data at a fixed point in order to predictive a phenomena.

Setting

The setting for this research study was at a four-year public university in southeastern North Carolina. The university's School of Nursing offered a pre-licensure baccalaureate of science in nursing and a RN-BSN completion program. The pre-licensure BSN program was 127 credit hours in length, including a total of 57 credit hours of liberal studies and other prerequisites at the lower division level (J. Brisson, personal communication, March 28, 2016). The five semester pre-licensure BSN program was the focus of this study.

Sample

The population for this study included all 94 students who were admitted to the School of Nursing's pre-licensure baccalaureate program in between Fall 2013 to Fall 2014. The total population was examined for this study.

Protection of Human Subjects

Prior approval from the university's Institutional Review Board and from the University's Institutional Review Board was obtained. This study met the criteria for Human Subject Protections Regulations exemption because there were no risks for the students. Because extant data was used, informed consent was not applicable or required. Raw student data was retrieved by the university's personnel from available student databases and maintained in a secure location throughout the study. Entries were keyed into an excel spreadsheet by the university's academic advisor for the nursing department and provided to the primary researcher in a password protected encrypted digital file. To organize the data, the primary researcher assigned unique identification numbers to each student. No information that could identify or be linked to the student was collected or entered into SPSS 24 for analyses.

Data Collection

Academic records of students admitted to the five semester pre-licensure BSN program was collected from a student database belonging to the Department of Nursing Academic Advisor and admissions records from the Office of Admissions. The data included the Kaplan Nursing School Entrance Exam composite and subtest scores, first year upper division nursing course grades including NURS 321, NURS 324, NURS 326, NURS 350, NURS 350L, and NURS 365, the admission term, graduation date, and enrollment status for each semester following the admission term for each student. Study variables and descriptions are listed in Table 1.

Independent Variables

The independent variables representing the student's ability to apply math, science, reading, and writing skills in nursing school was computed using the Kaplan Nursing School Entrance Exam consisting of four subtest. All independent variables are continuous and were operationalized using scale. The first independent variable is the Kaplan Nursing School Entrance Exam composite score. This variable is used to measure the student's ability to perform in nursing school.

Math Skills: This independent variable is represented by the Kaplan Nursing School Entrance Exam Math score. The Math subtest measures the student's ability to apply mathematical principles in conversions, operations, ratios, and word problems (Sanders et al., 2012).

Science Skills: This independent variable is represented by the Kaplan Nursing School Entrance Exam Science score. The Science subtest measures the student's knowledge of physiology in cardiovascular, electrolytes, gastrointestinal, immunology, neurology, renal, hematology, homeostasis, respiratory, and sensory (Sanders et al., 2012).

Reading Skills: This independent variable is represented by the Kaplan Nursing School Entrance Exam Reading score. The reading subtest measures the essential skills required for reading including the ability to determine the logic of a passage, comprehend details, draw basic inferences, and identify the purpose of a passage (Sanders et al., 2012).

Writing Score: This independent variable is represented by the Kaplan Nursing School Entrance Exam Writing score. The writing subtest measures the essential skills

required for writing including assessing passage development, paragraph logic, and mechanics of writing (Sanders et al., 2012).

Dependent Variables

The first dependent variable, academic success, was represented by the student's first year upper division nursing course grades. The nursing courses included were NURS321: Health Assessment, NURS324: Pathophysiology, NURS326: Concepts Basic to Nursing, NURS350 Adult Health I, and NURS350L: Adult Health I Clinical, and NURS365: Pharmacological Concepts. Upper division nursing course grades were operationalized as a dichotomous variable with students being categorized as 1 = successful (all course grades ≥ C) and 0 = unsuccessful (at least one course grade < C).

The second dependent variable, program completion, represents student attrition. Successful program completion includes those students who graduated on time at the end of five semesters with the original admission cohort. Unsuccessful program completion include those students who had a delayed graduation or who did not complete the nursing program with the original admission cohort. Program completion was operationalized as a dichotomous variable with students being categorized as 1 = on time graduation and 0 = delayed or denied graduation. Attrition is computed as the number of students withdrawn from the program at the end of the five semesters.

Table 1

Description of Study Variables

Variable	Type of Variable	Definition	Quantification
	Independent		
Kaplan Score	Continuous	Measurement of the student's ability to perform academically in a school of nursing	Kaplan Nursing School Entrance Exam Composite
Math Skills	Continuous	Measurement of the candidate's ability to apply basic mathematical and algebra principles	Kaplan Math Subtest Score
Science Skills	Continuous	Measurement of the student's knowledge of physiology	Kaplan Science Subtest Score
Reading Skills	Continuous	Measurement of the student's ability to apply essential skills required for reading	Kaplan Reading Subtest Score
Writing Skills	Continuous	Measurement of the student's ability to apply essential skills required for writing	Kaplan Writing Subtest Score
	Dependent		
Program Completion	Ordinal	Graduated on time at the end of 5 semesters with the original admission cohort	1 = on time graduation 0 = delayed or denied graduation
Academic Success	Ordinal	Earned grade in the 1st year upper division nursing courses	1 = successful (grades ≥ C) 0 = unsuccessful (grades < C)

Data Analysis

Data was be entered into SPSS 24 and analyzed using descriptive and inferential statistics. Descriptive statistics was performed to determine the measures of central tendency and measures of spread using the mean, standard deviation, and frequency. The level of statistical significance was set at $p = .05$.

Correlational analysis was performed to examine if significant relationships between study variables existed. Since the dependent variables are rank-ordered, Spearman's rank correlation coefficient was used to evaluate relationships between study variables (Field, 2013).

CHAPTER IV

Results

The purpose of this study was to examine the relationship between performance on the Kaplan Nursing School Entrance Exam and early academic success and program completion in pre-licensure baccalaureate nursing students. Results of descriptive and correlational analyses of study data was accomplished using the SPSS 24 statistical package. Descriptive statistics include means, standard deviations, and frequency distributions. Correlational analysis was used to examine relationships among the study variables.

The data set for this study was extracted from a student database maintained by the Academic Advisor for the Nursing Department. Institutional Review Board approval to conduct the study was granted by the southeastern public university and the University that the researcher attended.

Sample Characteristics

All students (n=94) admitted to the five semester pre-licensure baccalaureate of science in nursing program at the university in the southeastern region of North Carolina from Fall 2013 to Fall 2014 were included as participants in this study. Of the 94 students, 33 (35.1%) were admitted in Fall 2013, 27 (28.7%) were admitted in Spring 2014, and 34 (36.2%) were admitted in Fall 2014. This is described in Table 2. The whole population was used because the number of eligible subjects was too small and the loss of even a few subjects could affect the validity of the study.

Table 2

Description of the Population (N = 94)

Admission Term	Frequency	Percent
Fall 2013	33	35.1
Spring 2014	27	28.7
Fall 2014	34	36.2

Major Findings

The independent variables were representative of the student's performance on the Kaplan Nursing School Entrance Exam that was administered prior to acceptance into the Upper Division Courses of the Nursing Program. The goal of this study was to provide faculty with empirical data to guide future strategies for plans and decision when designing student admission and selection criteria for its nursing programs.

Descriptive statistics were examined for frequency distribution, mean, and standard deviation for each independent variable in Table 3.

Table 3

Descriptive Statistics of Independent Study Variables (N=94)

	Mean	Standard Deviation
Kaplan Score	71.70	7.632
Math Score	83.48	8.726
Science Score	55.07	12.205
Reading Score	80.51	12.345
Writing Score	64.49	11.694

Ability to perform in nursing school was measured by the Kaplan Nursing School Entrance Exam composite score. The mean score and standard deviation for the composite score was *(M = 71.70, SD = 7.63)* with a range of 52 to 91. The composite scores were normally distributed in Figure 1.

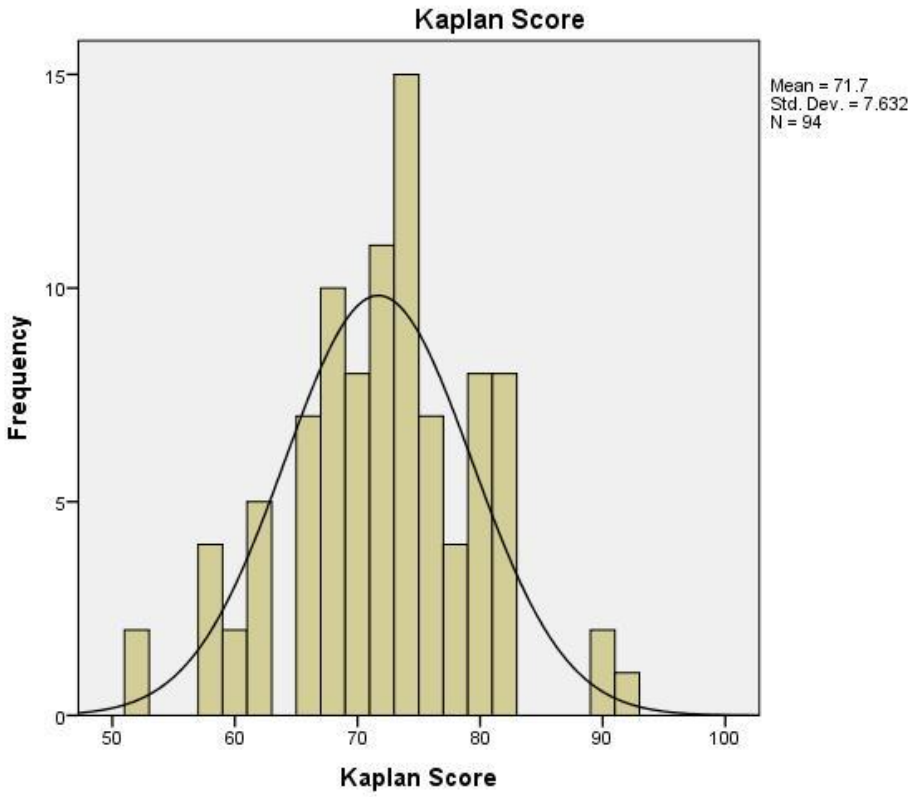

Figure 1. Histogram of Kaplan Nursing School Entrance Exam Composite Score

Math skills were measured by the Kaplan Nursing School Entrance Exam math score. The mean score and standard deviation for the math score was *(M = 83.48, SD = 8.73)* with a range of 54 to 96. The math scores were skewed toward the lower values in Figure 2.

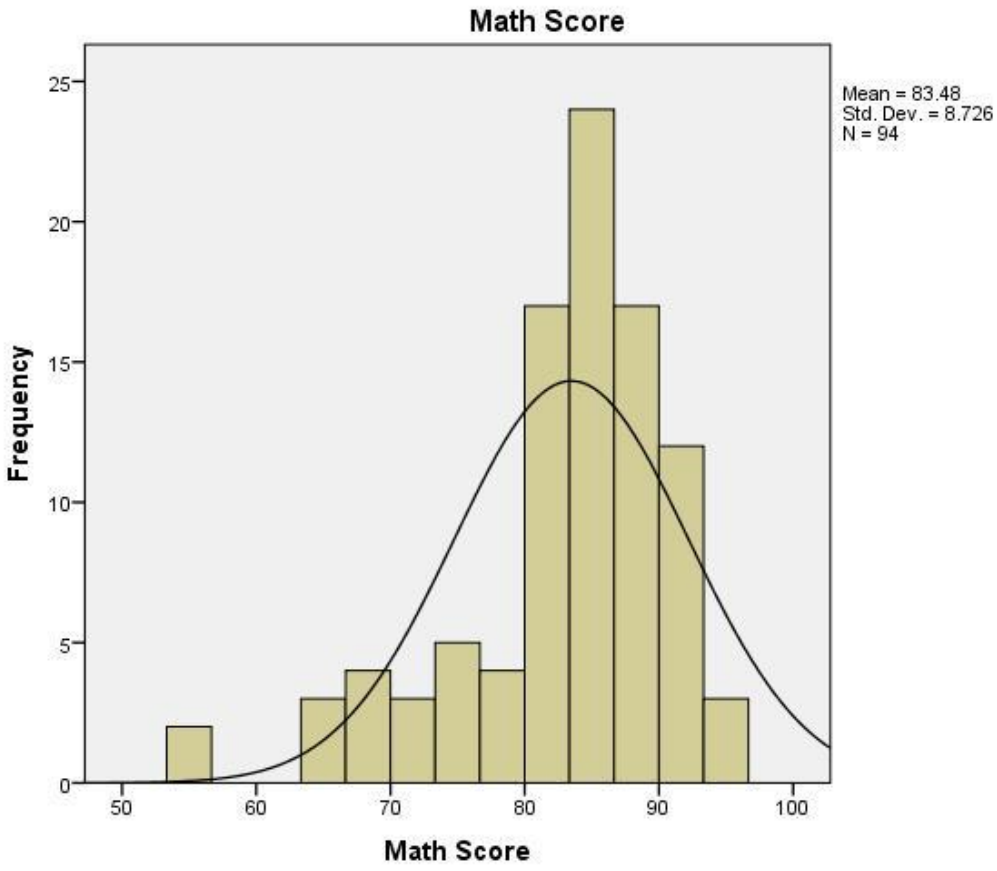

Figure 2. Histogram of Kaplan Nursing School Entrance Exam Math Score

Science skills were measured by the Kaplan Nursing School Entrance Exam science score. The mean score and standard deviation for the science score was *(M = 55.07, SD = 12.21)* with a range of 30 to 91. The science scores were normally distributed in Figure 3.

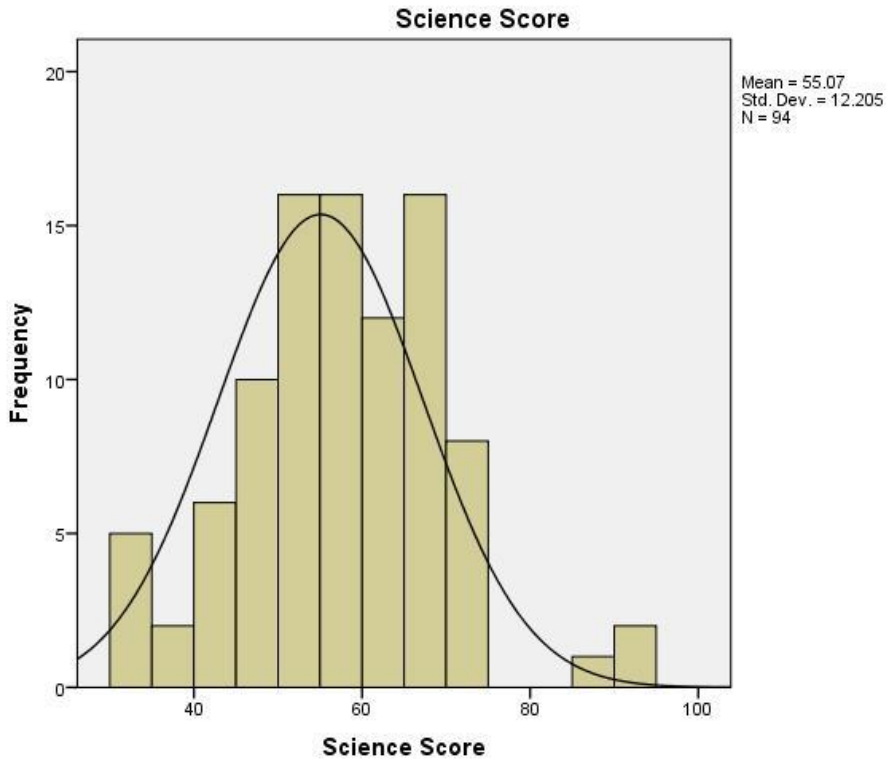

Figure 3. Histogram of Kaplan Nursing School Entrance Exam Science Score

Reading skills were measured by the Kaplan Nursing School Entrance Exam reading score. The mean score and standard deviation for the reading score *(M = 80.51, SD = 12.35)* with a range of 45 to 100. The reading scores were normally distributed in Figure 4.

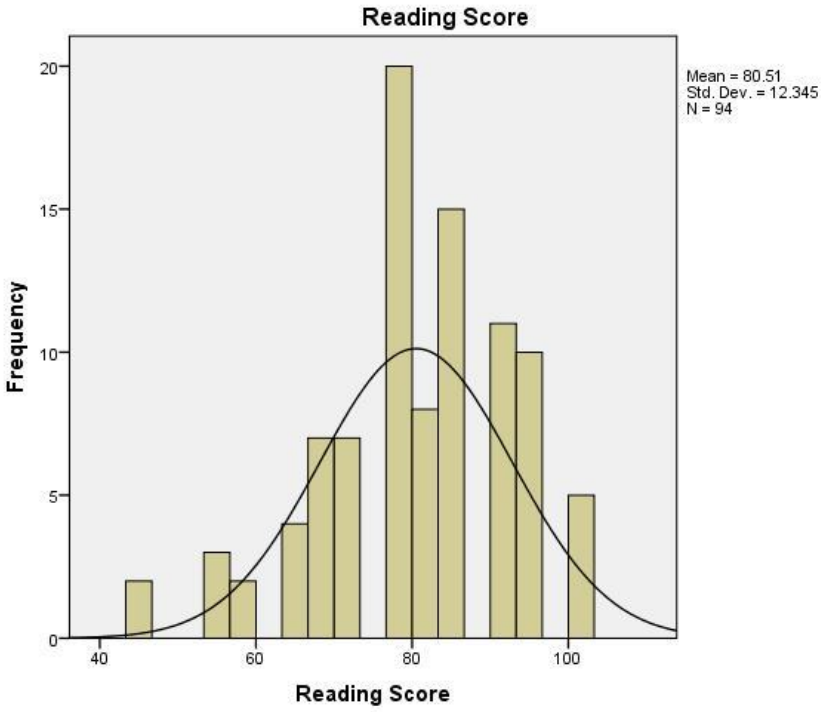

Figure 4. Histogram of Kaplan Nursing School Entrance Exam Reading Score

Writing skills were measured by the Kaplan Nursing School Entrance Exam writing score. The mean score and standard deviation for the writing score *(M = 64.49, SD = 11.69)* with a range of 43 to 90. The writing scores were normally distributed in Figure 5.

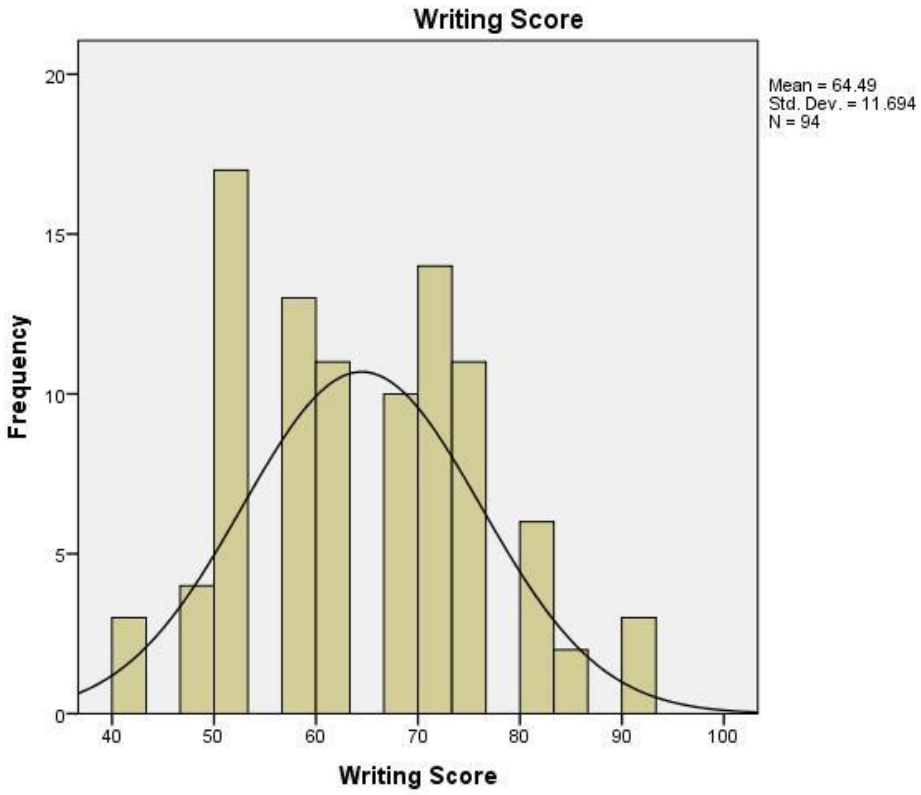

Figure 5. Histogram of Kaplan Nursing School Entrance Exam Writing Score

The dependent variable, academic success, was represented by performance in first year upper division nursing courses of the pre-licensure BSN program. Academic success was defined as those students who earned a grade no less than a C in any nursing course during the first year of the upper division nursing program. Unsuccessful students were defined as those who were voluntarily or involuntarily dismissed from the program or who had earned at least one grade less than a C in any of the nursing courses within the first year of upper division nursing program. Nursing courses included in the analysis were NURS 321: Health Assessment, NURS 324: Pathophysiology, NURS 326: Concepts Basic to Nursing, NURS 350 Adult Health I, and NURS 350L: Adult Health I Clinical, and NURS 365: Pharmacological Concepts. This variable was coded as 1 = successful (all course grades ≥ C) and 0 = unsuccessful (at least one course grade < C). Of the 94 students in Table 4, (59.6%) N = 56 were successfully completed the first year of upper division nursing courses with a grade C or higher and (40.4%) N = 38 were unsuccessful, having earned at least one grade less than a C or withdrew.

Table 4

Descriptive Statistics of First Year Academic Success (N=94)

	Frequency	Percent
Unsuccessful	38	40.4
Successful	56	59.6

The dependent variable, program completion, represented student attrition. Successful program completion was defined at those students who graduated on time at the end of five semesters with the original admission cohort. Attrition was defined as students who had a delayed graduation or who did not complete the nursing program with the original admission cohort. This variable was coded as 1 = on time graduation and 0 = delayed or denied graduation. Of the 94 students in Table 5, (47.9%) N = 45 successfully completed the program within the five semester with the original admission cohort and (52.1%) N = 49 were did not successfully complete the program within five semesters with the original admission cohort. Twenty-six of the 49 students that did not successfully complete the program within five semesters did not continue with the program. The attrition rate for each term was Fall 2013 (N = 6) 18%, Spring 2014 (N = 10) 37%, and Fall 2014 (N =10) 29%.

Table 5

Descriptive Statistics of Program Completion (N=94)

	Frequency	Percent
Delayed or denied graduation	49	52.1
On-time graduation	45	47.9

Correlational Analyses

Spearman's rank correlation coefficient was used to evaluate the strength and direction of the relationships among variables (Field, 2013). This is the appropriate statistical test when one variable is rank-ordered. The strength of the relationships range between -1 and +1. Correlation coefficients that are closer to ±1 indicate a stronger correlation. A correlation coefficient that is 0 indicates no relationship. Positive coefficients indicate that the variables are directly related, whereas, negative coefficients indicate that the variables are inversely related (Makuka, 2012).

Results are displayed in Table 6. Two of the independent variables were significantly correlated with academic success. Kaplan Score ($rs = 0.32$, $p < .001$) and Science skill ($rs = 0.37$, $p < .001$) were statistically significant with a weak positive correlation. This suggest that academic success increases as Kaplan composite and science scores increase. Two of the independent variables were significantly correlated with program completion. Kaplan Score ($rs = 0.25$, $p < .017$) and Science skill ($rs = 0.23$, $p < .025$) were statistically significant with a weak positive correlation. This suggest that completing the program on time increases as science scores increase. Math, reading, or writing skills were not statistically significant with academic success or program completion.

Results of the correlational analysis showed a significant positive relationship between academic success and program completion ($rs = .789$, $p < .001$) in Table 6. Table 7 showed that 38 of the 49 students (77.5%) who did not graduate on-time with the original admission cohort were not successful during their first year of the upper division nursing program.

Table 6

Correlational Analyses Matrix

			1st Year Academic Success	On-time Program Completion	Kaplan Score	Math Score	Science Score	Reading Score	Writing Score
Spearman's rho	1st Year Academic Success	Correlation Coefficient	1.000	.789**	.324**	.155	.368**	.198	.160
		Sig. (2-tailed)	.	.000	.001	.137	.000	.055	.123
		N	94	94	94	94	94	94	94
	On-time Program Completion	Correlation Coefficient	.789**	1.000	.245*	.147	.231*	.126	.121
		Sig. (2-tailed)	.000	.	.017	.156	.025	.227	.244
		N	94	94	94	94	94	94	94
	Kaplan Score	Correlation Coefficient	.324**	.245*	1.000	.542**	.616**	.766**	.667**
		Sig. (2-tailed)	.001	.017	.	.000	.000	.000	.000
		N	94	94	94	94	94	94	94
	Math Score	Correlation Coefficient	.155	.147	.542**	1.000	.058	.430**	.175
		Sig. (2-tailed)	.137	.156	.000	.	.581	.000	.092
		N	94	94	94	94	94	94	94
	Science Score	Correlation Coefficient	.368**	.231*	.616**	.058	1.000	.303**	.371**
		Sig. (2-tailed)	.000	.025	.000	.581	.	.003	.000
		N	94	94	94	94	94	94	94
	Reading Score	Correlation Coefficient	.198	.126	.766**	.430**	.303**	1.000	.379**
		Sig. (2-tailed)	.055	.227	.000	.000	.003	.	.000
		N	94	94	94	94	94	94	94
	Writing Score	Correlation Coefficient	.160	.121	.667**	.175	.371**	.379**	1.000
		Sig. (2-tailed)	.123	.244	.000	.092	.000	.000	.
		N	94	94	94	94	94	94	94

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

Table 7

Two by Two Classification of Dependent Variables (N=94)

	On-time Program Completion	
	Delayed or denied graduation	On-time graduation
1st Year Academic Success		
Unsuccessful	38	0
Successful	11	45

Summary

Correlational analyses was used to examine the relationship between the Kaplan Nursing School Entrance Exam scores and academic success and program completion among a population of 94 pre-licensure baccalaureate nursing students at a southeastern university in North Carolina. Correlational analyses demonstrated that the Kaplan composite scores and science skills were statistically significant with academic success and program completion. Math, reading, and writing skills were not found to be statistically significant with academic success or program completion. The study findings provided empirical data to guide faculty decisions on admissions policies and are useful for identifying at-risk students for academic failure, delayed program completion, and attrition.

CHAPTER V

Discussion

This chapter will discuss findings related to performance on the Kaplan Nursing School Entrance Exam, academic success, and program completion. In the study the relationship of academic variables for students in a southeastern university in North Carolina was investigated. The discussion summarizes the academic variables found to have statistical significant relationships to academic success in the first year of the upper division nursing program and completion of the program. Application of the NURS model as a theoretical framework for research are discussed. Limitations of the study, implications for nursing, and recommendations for future research are also described.

Implication of Findings

This quantitative, non-experimental, correlational research study examined a cohort of 94 students enrolled in a pre-licensure BSN program at a southeastern university in North Carolina from Fall 2013 through Fall 2014. Academic data were collected to investigate the relationship of the variables to student academic success in the first year of the upper division nursing program and attrition. The academic variables included the Kaplan Nursing School Entrance Exam composite score and the subtest scores for math, science, reading, and writing. The student's earned grades in the first year of upper division nursing courses was the first dependent variable. The student's on-time program completion status was the second dependent variable.

The study variables were examined using descriptive statistics. Independent variables were explored using means, standard deviations, and correlational analyses to determine relationships among the dependent variables.

The first question in this study sought to determine if performance on the Kaplan Nursing School Entrance Exam is predictive of academic success measured by student performance on first year of upper division nursing courses. The southeastern university in North Carolina does not have a cut point for admission selection on the Kaplan Nursing School Entrance Exam. Points are assigned based using a three tier approach of the student cohort: three points (top 33.3%), two points (middle 33.3%), and one point (low 33.3%). Of the 94 students, 60% (N = 56) achieved academic success. Findings from this study provided evidence that performance on the Kaplan Nursing School Entrance Exam has a significant positive relationship with early academic success, which suggested as scores increase the likelihood of early academic success increases. The nursing courses examined for this study is inundated with physiological content. This could explain the positive correlation with the science scores and academic success in the courses included in this study. Student performance on the Kaplan Nurse Entrance Exam, particularly in the Science section, could be predictive of those students most likely to succeed in the first year of the upper division nursing courses.

The second question in this study sought to determine if performance on the Kaplan Nursing School Entrance Exam is predictive of student attrition measured by on-time graduation within the five semester pre-licensure nursing program. Forty-eight percent of the population successfully completed the program. On-time completion rate for students in this study is lower than the state average of 80% for all BSN programs in North Carolina according to NCBON (2015). Findings from this study provided evidence that performance on the Kaplan Nursing School Entrance Exam had a significant positive

relationship with program completion, which suggests as scores increase the likelihood of program completion increases.

Additionally, this study showed that all students who successfully completed the program and graduated on-time had also successfully progressed through the first year of upper division nursing courses. This would suggest that early academic success decrease student attrition. Student attrition rates between terms were 18-37%. According to Baum et al. (2013), 36% of the students enrolled fulltime over the age of 24 and 18% of the students enrolled fulltime age 24 or younger do not earn a degree or remain enrolled. The attrition rates for this study support that the attrition rate for this population is no different than the national average.

Application to Theoretical/Conceptual Framework

The NURS model provides an organizing framework that was developed specifically for the undergraduate nursing student in order to identify at-risk students, develop diagnostic-prescriptive strategies to facilitate success, guide innovations in teaching and educational research, and evaluate strategy effectiveness (Jeffreys, 2012). The NURS model enables faculty to critically assess admission policies, retention strategies, and interventions. The NURS Model suggests that students decide to persist or withdraw from nursing programs based on one or several variables. Academic factors is one student characteristic profile that nurse education programs can use to identify at-risk students and strategies to overcome retention and attrition issues (Jeffreys, 2012). This study explored the relationship between the performance on the Kaplan Nursing School Entrance Exam and early academic success through program completion. The NURS model was an appropriate framework to evaluation student retention in a nursing

program. Students with higher scores on the Kaplan Nursing School Entrance Exam and the science subtest were more likely to achieve early academic success and complete the program within the five semesters.

The NURS model can support educational research and interventions by faculty. Findings of this study support the importance of early identification of retention and attrition issues in nurse education programs. Because Schools of Nursing do not have standardized instruction, it is important for institutions to perform their own studies to identify factors that influence the success of their student population. The NURS model is not limiting. It can be used in whole or in part for investigative purposes allowing faculty to conduct simple inquiries to in-depth analyses.

Limitations

Limitations for this study were that findings were specific to a single university and the strength of the study may be institution specific. Results cannot be generalized for all nursing programs due to the differences and variability in curricula and student profiles. The results of this study are most relevant to the observed School of Nursing in southeastern North Carolina. Due to changes in curricula, results may also be limited to the time periods where the curricula has not significantly changed.

The study does not address all multidimensional factors of inquiry for nursing education programs to identify at-risk students and strategies to overcome retention and attrition issues (Jeffreys, 2012). This study used only a portion of the NURS model as the conceptual framework. Other academic outcomes used as part of the student selection process was excluded from this study such as Science and Math GPA and cumulative prerequisite GPA.

Implications for Nursing

The results of this study were pertinent to nursing education and have important implications for evidence-based practice in the admissions process. Findings provided empirical data to guide faculty decisions about admissions, identifying at-risk students, and implementing strategies to promote retention and progression through completion of the program. Student success has been proven to be directly correlated with academic outcomes (Jeffreys, 2007, 2012, 2014; Newton et al., 2007; Seldomridge & DiBartolo, 2004). Many nursing program use performance on a nurse entrance exam as part of the admissions criteria. Based on findings of this study, the Kaplan Nursing School Entrance Exam could be useful in predicting student academic success.

The role of faculty is to facilitate learning and prepare students to become professional nurses. Early identification of at-risk students provides opportunities of innovation in student advisement and teaching strategies. Faculty are able to appraise retention effort and develop enrichment programs. The results of this study could be relevant to other baccalaureate program that use the Kaplan Nursing School Entrance Exam as part of admission criteria and student selection.

Recommendations

The following recommendations are made based on the findings and conclusions of the study.

1. Consider developing an enrichment program for students prior to admission into the upper division nursing courses with a focus on physiology and other science principles. Improving science knowledge and skills prior to entry into the program could prepare the student for early academic success.

2. Establish a scoring threshold for Kaplan Nursing School Entrance Exam for admission. Low scoring students may not perform well in early nursing courses due to the rigor and complexity of the coursework.
3. Expand the existing database to include all admission criteria and continue to evaluate student outcomes, adding new cohorts to increase the population. Student demographics and other cognitive and non-cognitive variables have an influence on student outcomes. All variables that could impact student retention should be explored.

Conclusion

Ongoing workforce shortages continue to be an issue for the nursing profession. With limited seating in nursing programs, strategies to identify at-risk students are essential to admissions policies. This study was a primary investigation using the NURS model as a framework to evaluate the relationship of the Kaplan Nursing School Entrance Exam with early academic success and student attrition for a southeastern university in North Carolina. According to the results of 94 students, this study supports the use of the Kaplan Nursing School Entrance Exam as part of the admission criteria into the pre-licensure program and identified an area where emphasis on science skills could improve the academic success and attrition of their student population. More research is needed to establish the validity and reliability of the Kaplan Nursing School Entrance Exam as a predictor of academic success and attrition.

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