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Student Success and Reading Comprehension

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Walden University
2015

Abstract

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Laura T. Lottes-Bishop

MSN, University of Phoenix 2003

BSN, Southeast Missouri University, 1992

Doctoral Study Submitted in a Partial Fullfillment

of the Requirements for the Degree of

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Abstract

Nursing administrators are exploring interventions to increase student retention rates in order to decrease college costs, improve faculty effort and time developing courses, decrease administrative resources, and to continue their accreditation. The purpose of this study was to determine whether or not there was a correlation between the Test of Essential Academic Skills (TEAS) reading comprehension scores, American College Test (ACT) reading comprehension scores, Comprehensive Computer-Adaptive Testing (COMPASS) reading comprehension scores, and the cumulative college grade point average (GPA) of the first-year nursing student. The theoretical foundation for this study was Tinto's retention theory, which claims that students' past academic performance predicts retention. A correlation approach within a cross-sectional nonexperimental design was used by analyzing data from admission testing and the first-year cumulative GPA from 151 associate degree nursing students from a private college in the Southeast Missouri area. According to study results, there was no correlation between GPAs and reading comprehension scores. Additionally, ACT, TEAS, and COMPASS reading comprehension scores did not correlate with student retention rates. Administrators in the associate degree nursing program can use the results of this study to determine what interventions might determine the success of the first-year nursing student. Positive social change will result from a more diverse set of admission criteria for acceptance into the program and will assist the admissons committees to find the best candidates for the program.

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Dedication

I dedicate my dissertation to my mother and father. Without their encouragement and strength, I would not be who I am today. They instilled in me the importance of an education and the courage to take my knowledge and make a difference in this world.

I also dedicate this to my two wonderful daughters Shelby and Rebecca. They have given me strength to never give up on my dreams. I love them both.

Acknowledgements

There are so many people in my life who have supported me through this journey. I want to start with my sisters. Diane, Debbie and Denise I want to thank you for everything you have done for me. You have never realized that after mom passed away all of you were my strength to achieve this dream. The past years have been hard on me but you were always there picking me up and pushing me to be successful and happy. To my daughters Shelby and Rebecca, thank you for giving me the love and strength to never give up. My daughters are the most important people in my life and everything I accomplish is to show them that you can achieve anything in life as long as you put your mind and soul into it.

I also want to acknowledge my chair, Dr. Stacy Wahl, she provided me the insight and knowledge to complete this dissertation. There were times that I wanted to give up but her words of encouragement kept me going.

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Section 1: Introduction to the Study

Introduction

The nursing profession is experiencing a shortage of qualified registered nurses. According to Ramsburg (2007), by the year 2015, there will be a 20% deficit of registered nurses, and the demand for registered nurses is projected to grow by 40%. The number of retiring nurses will eventually exceed the numbers of nursing graduates entering the workforce (Auerback, Buerhaus, & Staiger, 2011). In December, 2011, Auerback et al., (2011) projected that the number of registered nurses, aged 23 to 26, will increase by 62%. With the increase of younger people entering nursing, the workforce is projected to grow faster in the next 20 years than previously predicted (Auerback et al., 2011). Although the nursing work force may be increasing, it is estimated that the aging population will increase from 13% to 19% by 2030 (Auerback et al., 2011) fueling the need for more registered nurses.

Auerback et al., (2011) suggested that future nursing shortages will depend on the health care needs of society. In the past, the nursing profession experienced shortages, but the future shortage is expected to last longer and be more severe than any shortage on record (Auerback et al., 2011; Shelton, 2003). There is a need to increase the number of nursing students due to the large number of registered nurses approaching retirement age and the health care needs of an aging population (Ramsburg, 2007). With a need to increase the number of successful nursing students, nursing programs need to prioritize efforts to improve retention rates and graduation rates of nursing students. In this study, I

explored the correlation between the entrance exams reading comprehension scores and the academic performance of associate degree nursing (ADN) students.

In Missouri, local colleges are pressured to increase enrollment and retain students in an effort to ease the current nursing shortage. The National Council of State Board of Nursing (2008) survey indicated that Missouri had a 9.5% shortage of registered nurses. Due to the need to graduate more nurses and the advancing age of practicing nurses (Kizza, 2007), it is important to know if there is a correlation between applicants' successful completion of a nursing program and their scores on entry level admission testing.

The success of a college student has been associated with course grades and standardized testing (Madigan, 2006; Newton, Smith, & Moore, 2007). The academic indicators used as admission selection variables are components of colleges' attempts to capture and retain a diverse student population (Fishman, 1961; Tinto, 1975, 2005). However, research on admission predictors for student success in concentrations of study remains limited (Newton et al., 2007). Universities and community colleges are studying admission criteria in order to guide students toward academic success (Newton et al., 2007). Tinto (1975, 2005) defined grade performance and intellectual development as academic measures to determin the success of college students. Nursing programs' admission criteria should identify those students who are risk of failing the National Council Licensure Examination for Registered Nurses (NCLEX-RN). The NCLEX-RN is a standardized test that all nursing graduates must pass in order to obtain a license and practice as a registered nurse. According to the National Council State Board of Nursing

(2009), the purpose of the examination is to determine if the individual taking the examination possesses the knowledge and skills necessary to deliver safe nursing care at the entry level. Nursing students who are not academically prepared have difficulties with general education courses (Lewis & Lewis, 2000; Symes, Tart, & Travis, 2005). The nursing students who are unsuccessful in their first year of school are at-risk of exhausting their finances and developing low self-esteem (Newton et al., 2007). The reasons for attrition in schools is due to a variety of factors that include academics, finances, degree change, or personal issues (Symes et al., 2005).

Some colleges compare academic performance by using essays, references, high school grade point average (GPA), and standardized assessment exams (Newton et al., 2007). Standardized assessment exams used as preadmission criteria for undergraduate programs include the Scholastic Aptitude Test (SAT) and the American College Test (ACT). Associate degree nursing programs use standardized assessment exams that include ACT, SAT, Comprehensive Computer-Adaptive Testing (COMPASS), Nurse Entrance Test (NET), and Assessment Technologies Institute (ATI) Test of Essential Academic Skills (TEAS). Although many standardized exams are associated with student success (Hopkins, 2008; Madigan, 2006; Newton, 2007), researchers have indicated a correlation between undergraduate student success, high school GPA, and standardized tests. According to Miller, Pope, and Steinmann (2005), the population of students in associate degree programs is continually changing. Forty-two percent of the students entering associate degree programs lack academic preparedness by performing below college level in reading, writing, or math skills (Perin, 2006).

The literacy rates among U.S. students over the past decade have declined (United States Department of Education [USDE], 2003). Allsopp, Minskoff, and Bolt (2005) administered an online learning needs questionnaire, and students reported having difficulty learning or processing information related to reading comprehension, study skills, reading fluency, quantitative reasoning, and writing. The USDE (2003) stated that "many college students have not actually mastered the reading, writing, and thinking skills we expect of college graduates" (p.x).

Reading comprehension is essential if a student expects to be successful in a nursing program, and success is dependent on the reader's ability to appropriately interrelate experiential knowledge with new information. Reading comprehension leads to an increased emphasis on the role of problem solving, which enables a student to critically think through the situation (Fahim, Barjesteh, & Vaseghi, 2012). Nurses use critical thinking skills in order to process the information and implement interventions to provide the best patient outcomes.

Statement of Problem

In the associate degree nursing program at a college located in the Southeast Missouri part of the United States, there were high attrition rates among students in the associate degree nursing program. The college admission's process required an overall ACT score of 21 for a traditional student and a COMPASS score of 75% in mathematics, 85% in reading comprehension, 85% in English, and 90% in science for the non-traditional student applying for admission to the nursing program. However, the retention rate of the first-year associate degree nursing student continued to be below

70%. Newton and Moore (2010) reported that nursing students who lack proficiency in reading, English, and writing at the beginning of their college education classes have difficulty in understanding nursing information.

Purpose of Study

Due to the nursing shortage, it is imperative that educational leaders have a means to more accurately predict the applicants' successful completion of nursing programs and their subsequent performance on the NCLEX-RN exam (Higgins, 2005; Newton et al., 2007). The goal of this study was to assist educational institutions in improving the selection criteria of nursing students by demonstrating the extent to which applicants' basic educational knowledge, as determined by their preadmission testing scores, correlated with their academic success. This study had far-reaching implications for change within nursing education. With better admission predictors for nursing students' success, colleges are able to enhance student retention rates and proactively address the limited number of qualified nurses.

In associate degree nursing programs across the United States, the retention rate for first-year students was reported to be at 72% (NLNAC, 2008). The retention rate for the first-year nursing students where the study was conducted was below 70% (Assessment Committee Annual Report, 2009). In this study, I explored whether or not there was a correlation between the TEAS reading comprehension scores, ACT reading comprehension scores, COMPASS reading comprehension scores, and the cumulative college GPA of the first-year nursing student.

Nature of Study

A non-experimental, cross sectional study using a convenience sample was used to measure possible bivariate correlations between variables (Creswell, 2005). In this study, I sought to determine whether or not there was a correlation between ACT, COMPASS, and TEAS reading comprehension scores and the students' first-year college cumulative GPA scores, including cumulative GPAs for nursing classes and general education classes. The college admission criteria consists of a written essay, references, high school transcript, and completion of the ACT exam for students 1 to 5 years out of high school or the COMPASS exam for the students out of high school greater than 5 years. The admissions committee at the college looked at the overall ACT score instead of the individual reading, math, and science scores. The COMPASS score for reading comprehension was required to be above 85% for those applying for admission to the nursing program.

Between 2009 and 2011, a total of 151 students were admitted to the associate degree nursing program. Upon approval from the president of the college and Walden University's Institutional Review Board (IRB), the academic records of 151 students were evaluated for inclusion in the study, which represents a full census. Fifty four of those students took the ACT; 54 took the COMPASS and 43 of the students took the TEASE. A list of students' names who were admitted from 2009 through 2011 was provided by the college. The list of student names remained confidential and was kept in the student record room locked in a file cabinet to which only I had access to. All of the names were removed and replaced with numerical identifiers for data collection. I used

the SPSS database to analyze all data. An ex-post facto analysis was used to determine whether or not there were correlations between ACT, COMPASS, or TEAS reading comprehension scores and the general education, nursing, and overall cummulative GPA for first-year nursing students. A more detailed discussion of the research methods is provided in Section 3.

Research Questions

The study was guided by the following research question. What is the correlation between reading comprehension scores from entrance exams and the overall commulative GPA of the first year associate degree nursing students' success? The independent variables were the ACT, COMPASS, and TEAS reading comprehension scores. The dependent variables were the first-year associate degree nursing students' general education GPA, nursing GPA, and cumulative GPA. The hypotheses that were developed were as follows:

$H_0$1 There is no statistically significant correlation between first year nursing students' overall cumulative GPA and ACT reading comprehension score.

H_a1 There is statistically significant correlation between first year nursing students' overall cumulative GPA and ACT reading comprehension score.

$H_0$2 There is no statistically significant correlation between first year nursing students' nursing cumulative GPA and ACT reading comprehension score.

*H*a2 There is statistically significant correlation between first year nursing students' nursing cumulative GPA and ACT reading comprehension score.

$H_0$3 There is no statistically significant correlation between first year nursing students' general education cumulative GPA and ACT reading comprehension score.

*H*a3 There is statistically significant correlation between first year nursing students' general education cumulative GPA and ACT reading comprehension score.

$H_0$4 There is no statistically significant correlation between first year nursing students' overall cumulative GPA and COMPASS reading comprehension score.

*H*a4 There is statistically significant correlation between first year nursing students' overall cumulative GPA and COMPASS reading comprehension score.

$H_0$5 There is no statistically significant correlation between first year nursing students' nursing cumulative GPA and COMPASS reading comprehension score.

*H*a5 There is statistically significant correlation between first year nursing students' nursing cumulative GPA and COMPASS reading comprehension score.

$H_0$6 There is no statistically significant correlation between first year nursing students' general education cumulative GPA and COMPASS reading comprehension score.

*H*a6 There is statistically significant correlation between first year nursing students' general education cumulative GPA and COMPASS reading comprehension score.

$H_0$7 There is no statistically significant correlation between first year nursing students' overall cumulative GPA and TEASE reading comprehension score.

*H*a7 There is no statistically significant correlation between first year nursing students' overall cumulative GPA and TEASE reading comprehension score.

$H_0$8 There is no statistically significant correlation between first year nursing students' nursing cumulative GPA and TEASE reading comprehension score.

*H*a8 There is no statistically significant correlation between first year nursing students' nursing cumulative GPA and TEASE reading comprehension score.

$H_0$9 There is no statistically significant correlation between first year nursing students' general education cumulative GPA and TEASE reading comprehension score.

*H*a9 There is statistically significant correlation between first year nursing students' general education cumulative GPA and TEASE reading comprehension score.

Conceptual Framework

The most used theoretical model on student retention was developed by Tinto (1987, 2005). Tinto (2005) focused on the role that the institution of higher education has on impacting the academic and social systems of the students and retention. Within the model, academic indicators of a student's educational goals included grade performance and intellectual development, as well as social interactions such as peer group and faculty interactions (Tinto, 1987).

Tinto's (2005) model of student persistence and commitment in academic performance and social integration stressed that a number of students entering colleges are insufficiently prepared for the rigors of higher education study. Tinto (2005) identified five variables that affected the student's ability to be successful in college: (a) students need to be clear about what is expected of them, (b) academic support is needed for success in learning, (c) frequent feedback from faculty to students about their academic performance is required, (d) students involved academically and socially are

more likely to graduate, and (e) students will become involved in learning if it is connected to their interests.

The central theme of Tinto's (1975) model is that positive academic and social integration into the college setting decreases students' decisions to drop out and fosters student retention. Tinto (1987) also discussed how assessment of academic and social indicators upon college admission could help predict the likelihood of student success in higher education settings. Academic indicators include various pre-entry attributes, such as prior schooling performance, skills, and student background. For the purpose of this study, the focus was on the academic indicators of ACT, COMPASS, and TEAS reading comprehension scores and the cumulative nursing GPA of the first-year nursing student. In Section 2 of this study, Tinto's theory is explained and referred to in more detail.

Operational Definitions

The following definitions serve to inform this study:

American College Test (ACT): Refers to the nationwide college-entrance testing program. The test measures the student's ability in four areas: English, math, reading, and science reasoning. The score range from each of the four tests is 1 to 36. The composite score is the average of the four test scores earned during a single test sitting, rounded to the nearest whole number (ACT, 2009).

Computer-Adaptive Placement Assessment and Support System (COMPASS):. A comprehensive, computer-adaptive testing program that assesses students' skill levels in reading, writing production, math, and English. It provides the college with the

information needed to place a student in an appropriate course and connect students to resources to achieve their academic goals (ACT, 2009).

Cumulative grade point average (GPA): The calculation of course grades based on the total number of raw points accumulated and divided by the total number of point's possible (College, 2010).

General education cumulative GPA: The general education courses taken prior to nursing courses. The courses are anatomy and physiology, English, college algebra, sociology, and psychology (College, 2010).

Nursing courses cumulative GPA: The nursing courses taken the first year of the program that includes fundamentals, mental health, geriatrics, Medical Surgical I, and Pharmacology I (College, 2010).

Student success: The end result of the first year of a nursing program with a general education GPA of 2.0 or above and a nursing GPA of 2.5 or above (College, 2010).

Test of Essential Academic Skills (TEAS): This is designed to provide assessment data regarding a student's overall academic preparedness for nursing related content. It consists of four components that include math, reading, science, and English (ATI, 2008).

Assumptions, Limitations, Scope, and Delimitations

In this study, it was assumed that the 151 participants took ACT, COMPASS, or TEAS exams to the best of their ability and completed the general education courses and nursing courses with the same objectives as described by the Missouri State Board of Nursing mandated curriculum. It was also assumed that the ACT, COMPASS, and

TEAS exams were administered and taken prior to admission in the program at an approved testing facility, and the test accurately measured past acadmic performance.

Because I used a convenience sample, results cannot be generalized to other populations. However, replication studies might add to the reliability of the findings. Other limitations included that (a) data collection was restricted to 151 students who completed an entrance exam prior to admissions into the program, (b) participants in this study had varying educational backgrounds, and (c) participants in this study were admitted to the associate degree program. I did not focus on social indicators or nonacademic variables of the students.

Significance of Study

Due to the nursing shortage, associate degree nursing programs are concerned about low retention rates and the factors that contribute to student success (Hopkins, 2008). Researchers have attempted to identify the correlation between high school GPAs, entrance exams, and cumulative college GPA. Despite this attempt, there was a gap in the literature regarding predictors of early academic success. Newton and Moore (2010) suggested neither reading nor English aptitude scores have been described in the nursing literature. The intent of this study was to determine whether or not there was a correlation between TEAS, ACT, and COMPASS reading comprehension scores and the general education courses GPA, nursing courses GPA, and overall cumulative GPA of firs- year nursing students.

Accrediting agencies monitor nursing programs for overall student success (Grace & D'Aoust, 2006). It is important for educational leaders to understand the causes of low

retention rates so that they will not lose their accreditation. Nursing programs are exploring intervention to increase their retention rates in order to decrease college costs, improve faculty effort and time developing the courses, decrease administrative resources, and to continue their accreditation. The completion of an ADN program of study, while challenging, can lead to a rewarding and varied career. However, failure to complete the nursing program or delayed graduation after acceptance to nursing coursework is costly to the student, family, the program's institution, and society (Grace & D'Aoust, 2006). A valid and reliable research study on the academic success of first-year students in an associate degree nursing program affects a stewardship in a community.

Summary

With the nursing shortage on the rise, nursing programs need to develop admission criteria to determine if a student can be successful in a nursing program. Because the retention rates were at a low level, the college needed to explore why students were not successful. Researchers have studied student success by ACT overall scores, TEAS overall scores, GPA, and NCLEX-RN. Researchers continue to assess ways to improve student retention rates.

In Section 2, the literature review, I address the nursing shortage, academic success and retention, entrance exams, the TEAS exam, and reading comprehension.

Section 2: Literature Review

Introduction

The literature review for the study was divided into eight categories that included the following: (a) student retention and success, (b) reading comprehension, (c) admission criteria, (d) ACT and GPA, (e) COMPASS and GPA, (f) GPA, (g) TEAS, and (h) reading comprehension and nursing. Limited research was found on COMPASS exam, reading comprehension, and a correlation of reading comprehension and success of the first-year associate degree nursing student.

The main focus of the review was on examining entrance exams, reading comprehension of college students, and success of an associate degree nursing student. Manual and computer searches were conducted using the following key words*: reading comprehension collegiate level, predictive variables for student success in nursing programs*, and *retention*. The primary databases and search engines used were Proquest, EBSCOhost, ERIC, Internet, Thoaru, and dissertation abstracts. The reviewed studies were derived from nursing journals, education journals, psychological journals, and other related literature obtained whtrough Walden University's Library.

The first year of an associate degree nursing program curriculum consists of general education and fundamental nursing courses. General education classes that are taken by each student in the first year of study include English composition, psychology, college algebra, speech, Anatomy Physiology 1 and 2, and nutrition. Nursing courses taken in the first year consist of fundamentals, skills, pharmacology, elderly nursing, and Medical Surgical 1.

Academic Success

Since the first standardized tests developed for assessing college readiness were administered, colleges have been searching for tools to evaluate prospective students to predict their potential for success. With high numbers of applicants and admission waiting lists, reliable predictors will allow colleges with competitive enrollments to admit those students with the greatest chance of successfully completing a nursing program. For the local college, this would foster retention, reduce operating costs, and increase the number of graduates. In turn, nursing programs would be able to predict the number of graduates entering the workforce to offset the nursing shortage. For the students, improving admission criteria would alleviate the financial burdens associated with lost tuition, expenses, and social embarrassment. The scholarly research concerned with the study of success of the first-year nursing student can be divided into several categories. As pertains to the success of a first-year nursing student and reading comprehension, only key studies were selected for this review.

Numerous factors contribute to student retention in higher education institutions, and researchers have suggested that these issues are multidimensional and complex (Altman, Musselman, & Curry, 2010; Pitkethly & Prosser, 2001; Tinto, 1975). Early researchers addressed retention as a measure of success based on academic and social involvement (Altman et al., 2010; Tinto, 1975). Tinto (1975) formulated a predictive theoretical model that explained the process of the interaction between the student and the institution that led students to discontinue their program at colleges. Tinto also

explored the different forms of dropout behavior that resulted from the process. Tinto argued that the student's integration into the institution's academic and social systems most directly related to his or her continuance in the program.

Include a topic sentence. Tinto (year) identified factors related to retention and persistence of students during their first year. The factors addressed were students' goal to commitment, perceived academic and intellectual development of students, student peer group relations, student finances, faculty interactions with students, faculty concerns, and institutional commitment to engagement of students (Altman et al., 2010; Tinto, 2005). The most important factor for persistence was found to be the students' perception of successful academic and intellectual development (Altman et al., 2010; Tinto, 2005).

Include a topic sentence. Tinto (2005) noted that the number of nontraditional students entering higher education programs was increasing, and the percentage of those students who persisted to graduation was estimated to be lower than for traditional students. Bradley (2002) indicated that 70.8% of students' academic performance affected the retention rates in higher education programs. The other variables that affect retention are financial need and the demands of family and work (Bradley, 2002). According to Tinto (2005), research on admission variables that were good predictors of college success could be divided into two broad categories: academic or intellectual factors such as admission testing and social factors. Tinto indicated that dividing students into different groups based on ACT scores, income, gender, and GPA showed no correlation to student retention. This research was done on academic success and was

based on admission criteria in relation to academic and intellectual factors (Altman et al., 2010; Ishitani & DesJardins, 2002).

The current trend in nursing education is to require students to complete various science, liberal arts, and other support courses before admission to the nursing program. At the local college used for this study, students are required to complete 1 year of general education courses before starting their nursing courses. Byrd, Garza, and Nieswiadomy (1999) examined those predictors of successful completion of a baccalaureate nursing program versus failure or dropout. Byrd et al. gathered demographic data on a sample of 285 nursing students. GPA analyses were based on data for 278 students. Byrd et al. reported that 197 students (70.8%) completed the program, 22 students (8%) failed, and 59 (21.2%) dropped out. Grades in biological sciences courses, social science courses, and chemistry were predictors of success. Byrd et al. concluded that a higher cumulative prenursing GPA was a predictor of graduation. However, Bryd et al. warned about generalization of the study results because most of the students were transfer students and had completed degrees prior to entering the program.

Include a topic sentence. Bean and Metzner (1985) developed a model based on Tinto's student integration model on attrition. In this study, a student's decision to leave the academic setting centered on academic performance, psychological outcomes, background, and environmental variables. Bean and Metzner conducted an in-depth review of attrition theory and studies on student variables and the relationship that was expected to affect attrition decisions. The main reasons for student dropout are low grade

average, low number of hours enrolled in academic courses, lower satisfaction in the role of the student, relative youth, and restricted opportunity to transfer (Bean, 2005; Bean & Metzner, 1985; Jefferys, 2007).

Include a topic sentence. Sandiford and Jackson's (2005) study resulted in a model that demonstrated the relationship of various motivational, socioeconomic, and academic variables to students' retention in the associate degree nursing program in order to identify which students would pass or fail generic nursing courses in the first semester of college. Sandiford and Jackson based their model off of Tinto's student integration model and Bean and Metzner's student attrition model. Sandiford and Jackson indicated a significant difference at the $p<.001$ level for presemester GPA. Students with a presemester GPA of 2.5 or higher had greater retention rates than students with a GPA between 2.00 and 2.49 (Sandiford & Jackson, 2005). This is significant to the current study of predicting the success of the first-year associated degree nursing student.

One-third of students accepted into nursing programs withdraw after the first semester (ACT, 2009; Oliver, 1985). Associate degree nursing programs in the United States had a retention rate of 72% for first-year students (NLNAC, 2008). At the college participating in this study, the retention rate was reported at 70% (Assessment Committee Annual Report, 2009). Colleges are accepting a greater number of students with academic deficiencies, which leads to higher attrition rates (Lewis & Lewis, 2000; Newton, 2008). Admission committees for nursing programs struggle to select students who are most likely to successfully complete the course of study, thus improving the

success of students fortunate enough to obtain an enrollment slot in the nursing program (Schmidt & MacWilliams, 2011; Yin & Burger, 2003).

Include a topic sentence. Fowles (1992) suggested that each nursing program examine admission criteria to determine what factors are the best predictors for the success of a nursing student. Fowles requested that the nursing program develop interventions to improve performance and increase retention rates (Newton, 2008). Schmidt and MacWilliams (2011) provided a follow-up study to the one done by Tuminia (1997) that used strategies provided by the remedial and enrichment programs on the success of disadvantaged and minority students entering an associate degree nursing program. The researcher found no differences in grades but the strategies provided by the program did influenced student success and enhanced retention (Gallagher, Bomba, & Crane, 2001; Schmidt & MacWilliams, 2011).

Goodyear and Lampe (2004) analyzed several admissions' criteria for their ability to predict success at the University of Washington Medical Technology Program (UWMTP). The records of 183 students from the class of 1993 through the class of 2000 were analyzed and evaluated statistically using Pearson correlation and Cox proportional hazards regression analysis. Scores for the standardized tests Allied Health Professions Admissions Test (AHPAT), cumulative GPA earned at all previous colleges, science GPA calculated only from selected prerequisite courses, letters of recommendation, and a personal interview ranked applicants from admission to UWMTP. According to Goodyear and Lampe (2004), it was evident that standardized tests could predict success in a medical technology certification examination. A limitation cited in the research

referred to four students in the study who were admitted based on the criteria but who were later unsuccessful in the college setting. Another limitation is that when using GPA, it is difficult to decipher the meaning of grades assigned at different colleges and universities due to differences in grading scales, issues of grade inflation, and questions about the meaning of grades earned five or more years previously.

Madigan's (2006) research evaluated the prehospital care students' first-year academic performance by addressing two questions. First, could previously identified academic factors be used to predict first year academic performance and success for students undertaking a newly developed, vocationally orientated prehospital care course delivered in a rural setting? Second, could the study's findings be used to develop appropriate student selection criteria to assist in the admission of students into relevant tertiary studies or the prehospital care industry? Madigan conducted a retrospective review of all first-year, on campus, prehospital care students enrolled in a vocational course at a rural Australian university from 1998 to 2001 to develop prehospital care students' selection criteria. After six predictors of academic performance were examined, it was found that three dependent variables assessed academic performance: overall GPAs of 135 students, 71 women and 64 male, who completed all required first year subjects; GPAs of students who completed at least one subject in the first year; and students' ability to successfully complete the first year (2006). In addition to Madigan research, the previous related health experiences, postsecondary educational qualifications, backgrounds, and student entries combined predicted higher GPAs than individual predictors (2006). Therefore, the researcher found that the academic

performance of first year students in the prehospital care discipline could be predicted by the appropriate selection variable, GPA being the most reliable.

Meagher et al.'s (2006) quantitative research of 11 colleges and schools of pharmacy found that both Pharmacy College Admission Test (PCAT) scores and entering cumulative GPA showed moderate to strong predictive validity as indicated by student success in pharmacy school. The researcher's data included: entering cumulative and math/science GPAs, PCAT scaled scores, and pharmacy program GPAs of student grades for four years. The study determined the validity of the PCAT for predicting subsequent GPAs. The findings indicated that the PCAT scores and admission GPAs of students were predictors of success in a four year pharmacy program.

The primary objective of the nursing program is to prepare undergraduate students for entry-level professional nursing practice. Nursing programs are accredited by either the National League of Nursing (NLN) or the American Association of Colleges of Nursing (AACN). Curriculums and outcome objectives for nursing programs are similar in their expectations of students. Nursing programs are challenged to utilize the most reliable admission and progression criteria out of conscientious concern for stewardship of limited clinical slots, qualified faculty, and monetary resources available to finance the education program (Worrell, 1990).

The American College Test (ACT) is a nationwide college entrance testing program. The test measures the student's ability in English, mathematics, reading, and science reasoning. The college used in this study utilizes the ACT and COMPASS for admission into its program. Traditional students, who have been out of high school for

one to five years, took the ACT and non-traditional students, who have been out of high school for over five years, took the COMPASS.

Admission assessment for institutions of higher education has included standardized testing from ACT since 1959 (ACT, 2009). Allen and Sconing (2005) conducted a study for the purpose of identifying scores for mathematics, reading, English composition, and science on the ACT that would predict the success in the first semester course work. The data collected by ACT consisted of sample sizes of 2,475 in English composition, 2,699 in algebra, 3,341 in science, and 4,119 in reading (Allen & Sconing, 2005). These researchers used a hierarchical logistical regression model to identify the score that provided a 0.50 probability of earning a grade of at least a "B" in each respective course. The ACT benchmark for a student to be successful was a score of 18 or better in English, a score of 22 or better in mathematics, a score of 24 or better in science, and a score of 21 or better in reading (2005).

Reason (2004) conducted research to assess the predictive ability of the ACT index score in relation to college level student retention. The findings from the research indicated that the ACT index was a "significant predictor of retention" (Reason, 2004, p. 184), but was not as predictive as the individual ACT composite score. Reason's study failed to support findings by earlier researchers supporting the use of the ACT index score (Reason, 2004).

In 2005, ACT reported that only 51% of high school graduates were ready for college-level reading and that more students were on track to being ready for college level reading in eighth and tenth grade then by the time they reached twelfth grade (ACT,

2006). ACT (2006) college readiness benchmark in reading represents the level of skill required for students "to have a high probability of success" in college courses (p. 1). There is little research on ACT scores and the success of the first year nursing student. The literature review for this section is based on ACT and success on NCLEX-RN.

McClelland, Yang, and Glick (1992), found grades in pre-nursing courses were significant in predicting success in the baccalaureate nursing major from a sample of 1069. The pre-nursing courses indicated in the study were biology, chemistry, and social science. The research reported the highest predictor for NCLEX-RN success was the ACT composite score (r=0.48) and pre-nursing GPA (r=0.41) (Abbott, Schwartz, Hercinger, Miller, & Foyt, 2008). Younger and Grap's (1992) sample of 388 baccalaureate students indicated that course grades in pediatrics, obstetrics, and medical surgical nursing explained 55% of the variance in NCLEX-RN success. When adding the ACT scores and NCLEX predictor exam, the variance rose to 62% (Stuenkel, 2006).

Feldt and Donahue (1989) investigated the value of the ACT in predicting the success of nursing students on the NCLEX-RN. In a sample of 155 baccalaureate nursing students that completed the nursing program from Iowa's Mount Mercy College, the composite ACT score best predicted NCLEX success with multiple regression analysis of r=0.68, p<0.01. Their results indicated a possibility that the ACT subtest scores could predict NCLEX-RN success (1989).

Whitely and Chadwick (1986) conducted an analysis of 23 variables for predictability of success on NCLEX-RN. Out of 186 graduates, only 28 of them did not successfully pass the NCLEX-RN. The significant variables identified in this study were

ACT scores and GPAs. A study conducted by Roye (1997) used 194 associate degree graduates who completed the nursing program from 1992 to 1994. In the sample, ten of the students failed the NCLEX-RN exam. The results confirmed that of the 95% of the graduates who passed the NCLEX-RN, ACT composite score was higher than for the students who did not pass the examination (Morton, 2006).

Legacher and Keller (1990) reviewed records of 146 associate degree nursing graduates to determine if the variables of age, perception of role strain, ACT composite score, ACT math sub-score, ACT English sub-score, entrance GPA, and age had any correlation with NCLEX-RN success. The authors found that the best predictors were age, perception of role strain, and the ACT composite score. Other findings included that the entrance GPA correlated with the final GPA. The ACT composite score significantly correlated with the ACT English sub-score, ACT math sub-score, and NCLEX-RN. With these findings, nurse educators could identify those students who would be successful on the NCLEX-RN and those who would fail. There was no evidence of the authors considering the ACT reading scores (Morton, 2006).

O'Brien, et al., (2007) conducted a study at the University of South Dakota. This retrospective study reviewed student records focusing on identification factors that would support retention of nontraditional students. Scores of ACT for English and mathematics, Composite score, and scores on the math and reading sections on the COMPASS as well as some demographics were used to determine factors that may predict student retention. The study followed a cohort of students (N=490) enrolled in the fall of, 2001, through spring of, 2005. O'Brien identified that an ACT composite score equal to or less than 17

was the predictor of attrition for ages 17 and older. In addition, students whose ACT Composite or COMPASS scores required enrollment in either a remedial reading or mathematics course demonstrated initial higher retention rates that were reversed in the later years of the study (O'Brien, et al., 2007).

Schaid (2001) conducted a study to evaluate the effectiveness of a career technology preparation program in relation to student success. The study used COMPASS to evaluate student performance in reading, writing, and mathematics. The research found the students who took the technology preparation program "scored significantly higher on the COMPASS reading and writing assessments and on the numerical skills/pre T algebra domain of the math assessment" (Schaid, 2001, p. 84). These findings supported the use of COMPASS as a placement screening tool only (O'Brien, 2007).

A study by Chang (1988) compared the students' performance on computer adaptive tests (CAT) to their performance on paper and pencil. The study used the COMPASS and an adaptive program designed to provide an accurate evaluation of existing skills in mathematics, reading, and English (ACCUPLACER). One group practiced the ACCUPLACER four times over the course of study. Post testing for all of the participants included a final examination for the mathematics class. The study found that repeated testing on the ACCUPLACER did not increase the student scores on the COMPASS. In this case, it was determined that ACCUPLACER and COMPASS were not good predictors of how a student would perform on different formats (Bailer, 2006; Chang, 1988).

Bailer's (2006) study on student retention reported that 66% of students whose COMPASS scores required remediation in math (n=274) were female (p.111). In addition, 62% of students whose COMPASS scores required remediation in writing (n=86) were female (Bailer, 2006). The sample size of students requiring remediation in reading was so small (n=20) that no significant conclusions could be drawn. Bailer's findings supported the recommendations of Schaid (2001) and Chang (1998), while presenting gender specific data on COMPASS scores and remediation.

Many studies have been done to identify predictors of academic success in BSN programs and performance on the NCLEX-RN (Mills, Sample, Pohlman, & Becker, 1992) but few studies have been done on ADN programs and the success of the first year nursing student (Abbott, Shwartz, Hercinger, Miller, & Foyt, 2008). Research revealed that high school percentile rank was consistently the best predictor of GPA for college course work and that GPA for biological and behavioral sciences had the highest correlation with the cumulative collegiate GPA (Abbott, et al., 2008; Seither, 1980). Stuenkel (2006) found that the GPA on admission to the nursing program was a significant predictor of success within the program and on the licensing exam. Yocum and Scherubel (1985) noted a significant relationship existed between preadmission GPA's and nursing program success (Stuenkel, 2006).

Glick, McClellan, and Yang's (1987) study of 210 graduates of a baccalaureate nursing program's best predictions for success on the NCLEX-RN were pre-nursing GPA ($r = 0.64$), social science GPA ($r = 0.58$), and biology GPA ($r = 0.54$) (Abbott, Shwartz, Hercinger, Miller, & Foyt, 2008). In a study of 68 A.D.N. graduates, grade point average

(GPA) of pre-nursing courses were predictive of success on the NCLEX-RN while the overall GPA was not predictive (Sayles, Shelton, & Powell, 2003). In another study of 186 baccalaureate graduates, higher cumulative GPA at graduation was associated with NCLEX-RN success (Seldonmridge & Dibartolo, 2004). Studies done by Bentley (2004), Hardin (2005), and Higgins (2005) identified that students with higher GPA scores in the science courses was associated with NCLEX-RN success and performance in nursing courses predictive of NCLEX-RB success (Hardin, 2005; Higgins, 2005).

In a retrospective analysis of 394 student records, researchers were able to account for 67% of the variance in NCLEX-RN scores (Horns, O'Sullivan, & Goodman, 1991). Race and GPA before admission were significant predictors of NCLEX-RN accounting for 33% of the variance. The second year students' grade from the nursing process course accounted for 14% of the variance. The third year students' medical surgical course grades accounted for 11% of the variance and the last year predictor exam accounted for 9% of the variance.

Arathuzik and Aber (1998) studied 79 students who had completed a baccalaureate nursing program one month prior to the study. A significant correlation was found between NCLEX-RN success and the undergraduate GPA scores, English as a primary language, critical thinking abilities, and lack of adverse emotions such as anger, anxiety, guilt, and loneliness. Competency in critical thinking, higher cumulative GPA scores, fewer family responsibilities, and lower internal stressors had a minor correlation with NCLEX-RN (Landry, Davis, Alameida, & Renwanz-Boyle, 2010).

Wong and Wong (1999) used regression analysis to study the contribution of basic sciences to academic success in nursing education, including performance on the Canadian licensure examination. Wall, Miller, and Widerquist (1993) researched variables both before and during the nursing program to determine predictors of licensure examination success. Those variables included high school rank, sophomore GPA, GPA in the sciences, nursing and senior GPAs, and the NLN Achievement Tests taken at the end of each semester. Based on the t-test, the prediction accuracy for those students who passed the NCLEX was higher than those students who were likely to fail (Lauchner, Newman, & Britt, 2006). In 2000, Lewis and Lewis studied a group of students transferring into a baccalaureate nursing program. The researchers found a mild correlation between transfer students and nursing school failure. They determined that students who transferred into a nursing program had a weakness in anatomy and physiology (Newton, 2008).

Endres' (1997) research study indicated that there were no significant differences between the passing and failing rates of African American, foreign born, and white graduates on the NCLEX-RN, and there were no significant differences between individuals with and without prior licensure and pass/fail on the NCLEX-RN. Student with a D or F in a nursing course were more likely to fail the licensing examination than those who did not have a D or F. The ethnicity was unrelated to performance on the NCLEX-RN, but African American graduates who passed the NCLEX-RN were more likely to require significantly more semesters to complete the nursing curriculum (Nibert & Young, 2006).

Beeson and Kissling (2001) studied 505 baccalaureate nursing graduates in the southeast United States from 1993 to 1998. Those who passed the NCLEX-RN had higher GPA scores and made fewer grades of C or below than students who failed. This study also indicated that those students who passed the NCLEX-RN had higher biology grades than students who failed (Landry, et al., 2010). Beeman and Waterman (2001) analyzed 289 subjects from a baccalaureate nursing program using age, SAT verbal and math scores, biology grades, anatomy and physiology grades, pathophysiology grades, eight nursing courses, and GPA scores from sophomore year and senior year. The results indicated students who received a C+ or lower grade in nursing courses predicted failure on the NCLEX-RN exam (Landry, et al., 2010). Roncoli, Lisanti, and Falcone (2000) found that student who received A or B grades in science courses and upper level nursing courses were more likely to pass NCLEX-RN than the students with C or below grades in the same courses. Their conclusion was that nursing course grades was the better predictor of passing NCLEX-RN exam (Landry et al., 2010).

Researchers found the probability of passing NCLEX-RN decreased with students who received Cs in some of their nursing courses (Barkleyet al., 2001). Haas et al., (2004) found that the cumulative GPA before entering the nursing program was 0.3 points higher in students who successfully passed the NCLEX-RN. Buttry's (2003) correlation study indicated a relationship between anatomy and physiology and success on the NCLEX-RN exam. The researcher found a significant relationship between admission GPA and cumulative GPA in required sciences courses and passing the

NCLEX-RN. The students who obtained a high GPA entering the nursing program as well as the cumulative science courses GPA passed the NCLEX-RN (Burckhardt, 2004).

Test of Essential Academic Skills (TEAS)

Higgs (1984) reported verbal fluency and thought organization related significantly to academic success and that the personal characteristics of age and marital status were unrelated to program success. The TEAS exam from ATI was used as an entrance exam for various nursing programs admission criteria. The TEAS consists of four content areas: math, reading, English, and science (ATI, 2009). According to ATI, the TEAS test was designed to predict those students with the highest chance of being academically successful prior to admission into a nursing program. A study by Newton et al., (2007) indicated that the TEAS exam was able to predict first semester program success. The TEAS exam was a more reliable predictor for success in the first year than pre-nursing GPA.

Newton et al., (2007) research compared two cohorts of first semester nursing students admitted to a baccalaureate degree nursing program in California. The researchers surveyed 173 sophomore nursing students, 103 were enrolled in the fall and 70 were enrolled in the winter. Data used from the study included pre-nursing course grades, TEAS scores, and overall first semester nursing GPA from individual course grades. It determined that the students admitted into the fall semester had higher mean pre-nursing GPA, TEAS composite score, and first semester nursing GPA than the winter group. The findings did indicate that the quality of students admitted and academic outcomes were related (Newton et al., 2007).

In a Florida community college ADN program, Sandiford and Jackson's (2005) study sought to determine if there was a correlation between English proficiency, pre-semester GPAs, achievement tendency scores, hours planned to work, and difficulty in educational financing. Out of 258 admitted students only 190 qualified for the study. The findings of the study suggested the three ways to evaluate first semester ADN program students as follows:

> Students assessed at college language level had lower attrition rates, than students with below college language level. The difference was significant at the $*p \leq .001$ level. The second finding is students with a pre-semester GPA of 2.5 and above had lower attrition than students with a GPA between 2.49-2.00. The difference was significant at the $*p$ .001 level. The third finding was the assumption that the three nonacademic variables would affect first semester final course outcomes was not supported. Hours planned to work weekly, financial difficulty attending college, and achievement tendency were not significant predictor variables. (p. 11)

Jefferys' (2007) retrospective study at the City University of New York College of Staten Island examined entry, progression, graduation, and licensure characteristics of an ADN program. The data collected from the study included sources from first clinical nursing courses for 112 individuals of different cultures and ethnic groups. Academic grades were collected from Anatomy and Physiology I, English, Introduction to Psychology, and

Philosophy (Ethics). The pre-nursing and AP course grades did not influence retention, graduation or licensure; the variables did significantly correlate with the nursing curricular level of Medical Surgical nursing course grades. The students who achieved a minimum of a "B" in a prerequisite science course were more successful in the first semester nursing courses. Therefore, in the study, the Medical Surgical nursing course grades in the first semester significantly influenced student success in the program and passing of the NCLEX-RN (Jeffery, 2007).

Reading Comprehension

Reading is the basis for all academic courses and the knowledgeable and strategic reader are better able to comprehend the materials (Anmarkrud & Braten, 2008). College student graduates are not necessarily good readers. Even though college students are reading advanced academic material, it does not ensure that they always comprehend the information (Lei et al., 2009). Shaw (1999) stated that students spent the majority of their time reading and studying but college level courses do not put an emphasis on reading comprehension. In the United States, freshman college students typically finish the end of their first year with little reading comprehension skills (White, 2004).

Only 51 percent of 2005 ACT tested high school graduates are ready for college level reading and more students are on track to being ready for college level reading in eighth and tenth grade than by the time they reach twelfth grade (ACT, 2006). ACT's college readiness benchmark for reading represent the level of achievement to be a 75% chance of earning a course grade of C or better, and a 50% chance of earning a B or better (ACT, 2006). The ACT reading score benchmark is a score of 21 or higher in

order for the students to reach the level of achievement in their college courses (ACT, 2006). The percentages of ACT tested students who have met the reading benchmark has been declining since 1999. In 1999, 55% of the students who took the ACT obtained the reading readiness benchmark and in 2005 it dropped to 51% which was the lowest in twelve years (ACT, 2006).

Nursing Education

Academic success leading to the practice of professional nursing is effectively achieved by the nursing student through the use of reading and studying skills. The nursing education curriculum builds from the basic knowledge to analyzing information needed to provide competent nursing care (Byrd, Garza, & Niewiadomy, 1999). To gain the knowledge, the students must be able to read the nursing literature, textbooks, and nursing journals in order to be successful. Reading is a complex process that involves attention to the words and concepts in sentences followed by identification of the interrelatedness of the information to then come to a conclusion and understanding of the message (Cook, 2006; Duignan, 1992; Maxwell, 1997). For a student to read college textbooks, he or she must have complex skills, judgment, and a comprehensive relationship of ideas in order to interpret the meaning of the text (Cook, 2006; Poissant, 1994). Reading requires a deliberate approach by the student before, during, and after reading to comprehend the material (Caverly et al., 2004).

Gallagher, Bomba, and Crane (2001) studied the predictor variables in relation to an entrance examination for schools of nursing and a basic nursing course and determined that the reading comprehension subtest was statistically significant (r= 0.23,

$p<0.05$). The results revealed that a reading comprehension score of 32 was the threshold required for a student to have a 50% probability of success in the nursing program. When the grade of "B" or better was the criterion, analysis revealed that a student scoring 59 on the reading subtest had a 50% probability of earning a "B" or higher in a basic nursing course (Schmidt et al., 2011).

In another study (N=218), Gilmore (2006) attempted to identify variables that could serve as predictors of success in an associate degree of nursing program. Gilmore compared ACT reading, writing, science, and the total composite score along with students' grades in anatomy and physiology prior to admission to the nursing program. The findings determined a significant relationship between ACT composite, ACT reading, and ACT English scores and success in the nursing program (Bailer, 2006; Gallaher et al., 2001; Schmidt et al., 2011).

Nursing textbooks are characteristically comprehensive, include a large amount of content-dense information, and use discipline specific terminology (Katz et al., 2001). The publishers of nursing textbooks incorporate table of contents, organizational cues, chapter titles, indexes, objectives, visual aids, case studies, and study questions (Nist et al., 1998). Many students enter the academic setting with a lack of reading skills (Cook, 2006) and are not adequately prepared to read effectively.

Nursing students must have a good understanding of the materials they read. Reading comprehension is an important factor in determining if a student can be successful. Jackson (2005) compared reading comprehension, oral reading fluency, and decoding. Reading comprehension was a significant predictor of college students' GPA.

Fox's (1977) study described the differences between reading-difficulty levels of primary textbooks used in the first semester freshman general studies courses and reading skills of the students enrolled in those courses. The comparison study used Flesch Reading Ease Formula with Simplified Measure of Gobbledygook (SMOG) grading formula. The major finding of the study was that most of the textbooks were written on a level significantly above the reading ability levels of the students. There was no significant difference found between the two reading formulas.

Symes, Tart, and Travis' (2005) research revealed the significance of reading comprehension to success in baccalaureate nursing students. The findings of the study, based the data off the Nurse Entrance Test (NET), exhibited a strong correlation between reading comprehension and retention to graduation. The NET entrance exam is used to identify at risk students. The researchers use reading comprehension scores to identify the students at risk of failure and enroll them into a retention program. The program was evaluated by reading comprehension, graduate rates, and ethnic diversity which indicated those students who attended the remediation program successfully completed the nursing program. This study will use ACT, COMPASS, and TEAS reading comprehension scores and GPA from the first year to determine the success of the nursing student.

Henriques' (2002) study found students with a senior college reading level were successful in passing the NCLEX-RN and the students who were at Sophomore College reading level failed the NCLEX-RN. A recent study by Newton and Moore (2010) determined the relationship in reading and English aptitudes to formal writing ability. The researchers required 146 baccalaureate sophomore nursing students to take the TEAS

exam. The results indicated the reading aptitude were higher than the English aptitude. English aptitude was more of a predictor in writing skills than reading because it addressed punctuation, grammar, sentence structure, and spelling. Reading comprehension was not addressed in the study.

Yoho, Young, Adamson, and Britt (2007) conducted a longitudinal correlation case study to determine the accuracy of the Health Education Systems, Inc. (HESI) nursing standardized examination in predicting success in an associate degree nursing program. Yoho et al. (2007) used standardized testing to identify students academically prepared to succeed in the program and those at risk for failure once enrolled in the program. The cohort of 139 ADN students in a southwest Texas school took the HESI exams on admission, mid-curricular point, and on exit. The study found that on admission, 92.9% of the students achieved the minimal acceptance score of 70% or higher on the math examination and 87.05% achieved a minimal score of 70% or higher on reading comprehension. Pearson correlations were calculated to determine a relationship between admission and mid-curricular point scores. The admission math scores were not significantly correlated with mid-curricular scores but the admission reading comprehension scores were positively correlated to mid-curricular scores. The scores of mid-curricular were correlated with the exit scores and a strong correlation was found between the two variables (Yoho et al., 2007)

Summary

This section reviewed the literature related to retention, predictors of academic success, and reading comprehension. An overabundance of research has been reported

on predicting NCLEX-RN success, entrance exams, and GPA. Studies were found that examined variables of cumulative pre-nursing GPA, ACT scores, and grades in general science courses and other forms of standardized testing.

Those studies reporting variables in relation to a student's reading abilities used either NET which focused on at risk students or remediation programs. The study by Jackson (2005) focused on reading on reading fluency rather then comprehension in regards to success of a nursing student. Yoho et al.(2007) researched used the HESI exam throughout the program and did not focus on the GPA and entrance exams for the first year nursing student in an associate degree program.

Associate degree nursing programs require less general education classes than baccalaureate nursing programs. Reading comprehension is essential if a student expects to be successful in a nursing program of study. Reading comprehension depends on the reader's ability to interrelate appropriately acquired knowledge with the information suggested in the material. Reading comprehension leads to an increased emphasis on the role of problem solving which enables a student to critically think through the situation (Fahim, Barjesteh, & Vaseghi, 2012).

There seems to be no conclusive data related to determining the success of a first year nursing student. As the review of literature illustrated, there is a gap in the nursing literature and more research needs to be conducted on determining predictors of success in an associate degree nursing program. This study will examine whether or not there is a

correlation of the ACT, COMPASS, and TEAS reading comprehension to the general education GPA and nursing GPA for the first year associate degree nursing student

Section 3 provides a discussion of the research design used in this study. A description of research setting and samples will be presented as well as instrumentation for data collection and analysis. Section 4 will present the findings of the study and section 5 will discuss the significance of the findings, their implications, and suggestions for future research.

Section 3: Research Method

Introduction

In Section 1, I indentified the problem of retention and successful outcomes of associate degree nursing students in a convenience sample. I sought to determine if there was a correlation between the ACT, COMPASS, and TEAS reading comprehension scores and the cumulative GPA for the first-year associate degree nursing student. In Section 2, a complete literature review related to retention, predictors of academic success, and reading comprehension was completed. In the review, I showed a gap in the nursing literature regarding predictors of success of the first-year nursing student. The purpose of this section is to present the design, methodology, and procedures that were followed to conduct this study. Specifically, research approach and design, setting and sample description, instrumentation, data collection, data analysis, and the role of the researcher are discussed.

Research Design

This study represented an attempt to understand whether or not college entrance exams are associated with success of first-year associate degree nursing students. I sought to determine whether or not reading comprehension scores from the entrance exam are related to the success of the first-year nursing student. I used a correlation approach with a cross-sectional study design to investigate the strength of association between ACT, COMPASS, and TEAS reading comprehension scores and the students' first-year college overall, nursing, and general education GPA scores. The correlation

design was appropriate for this study because all data were collected at the same time from academic records.

The correlation was a way to measure the strength of association between the independent variables of ACT, COMPASS, and TEAS reading comprehension scores and the dependent variables of first-year nursing students' general education GPA, nursing GPA, and cumulative GPA scores. The entrance exam scores and GPAs were obtained from official academic records, including student transcripts and entrance exam results. General education GPA scores were prerequisite science, English, and mathematic courses. The first-year nursing courses were fundamentals, basic skills, mental health, geriatrics, Medical Surgical Nursing 1, and Pharmacology 1. I explored if there were significanct relationships between reading comprehension scores, cumulative GPA, and the success of the first-year nursing student.

The research tested the following hypotheses:

$H_0$1 There is no statistically significant correlation between first year nursing students' overall cumulative GPA and ACT reading comprehension score.

*H*a1 There is statistically significant correlation between first year nursing students' overall cumulative GPA and ACT reading comprehension score.

$H_0$2 There is no statistically significant correlation between first year nursing students' nursing cumulative GPA and ACT reading comprehension score.

*H*a2 There is statistically significant correlation between first year nursing students' nursing cumulative GPA and ACT reading comprehension score.

$H_0$3 There is no statistically significant correlation between first year nursing students' general education cumulative GPA and ACT reading comprehension score.

*H*a3 There is statistically significant correlation between first year nursing students' general education cumulative GPA and ACT reading comprehension score.

$H_0$4 There is no statistically significant correlation between first year nursing students' overall cumulative GPA and COMPASS reading comprehension score.

*H*a4 There is statistically significant correlation between first year nursing students' overall cumulative GPA and COMPASS reading comprehension score.

$H_0$5 There is no statistically significant correlation between first year nursing students' nursing cumulative GPA and COMPASS reading comprehension score.

*H*a5 There is statistically significant correlation between first year nursing students' nursing cumulative GPA and COMPASS reading comprehension score.

$H_0$6 There is no statistically significant correlation between first year nursing students' general education cumulative GPA and COMPASS reading comprehension score.

*H*a6 There is statistically significant correlation between first year nursing students' general education cumulative GPA and COMPASS reading comprehension score.

$H_0$7 There is no statistically significant correlation between first year nursing students' overall cumulative GPA and TEASE reading comprehension score.

*H*a7 There is no statistically significant correlation between first year nursing students' overall cumulative GPA and TEASE reading comprehension score.

$H_0$8 There is no statistically significant correlation between first year nursing students' nursing cumulative GPA and TEASE reading comprehension score.

*H*a8 There is no statistically significant correlation between first year nursing students' nursing cumulative GPA and TEASE reading comprehension score.

$H_0$9 There is no statistically significant correlation between first year nursing students' general education cumulative GPA and TEASE reading comprehension score.

*H*a9 There is statistically significant correlation between first year nursing students' general education cumulative GPA and TEASE reading comprehension score.

Setting and Sample

The setting of the study was at a local private college in the Southeast Missouri area. The college was accredited by the Higher Learning Commision and the National League of Nursing. In addition, the associate degree program was fully approved by the Missouri State Board of Nursing. There were 151 students admitted into the nursing program at the private local college from 2009 to 201l, and all students were represented in this study. The qualifications for student inclusion in the study were that the student be admitted between 2009-2011; he or she completed the COMPASS, ACT, or TEAS entrance examination; and that he or she completed his or her first year of general education and nursing classes. Of the 151 students, 54 took the COMPASS exam, 54 took the ACT exam, and 43 completed the TEAS exam.

A list of students names admitted from 2009 to 2011 was provided by the college. The list of student names remained confidential and were kept in the student record room locked in a file cabinet which could only be accessed by me, the president of the college,

and the dean of nursing. A numerical number was given to each student for data collection and to protect the privacy of the students. Therefore, it was not necessary to obtain consent from the students for use of the data reviewed and analyzed.

The president of college and dean of nursing approved me using the academic transcripts of the students to calculate all GPAs (Appendix A). The course grades were reported at the end of each term. The course grades were calculated based on the total number of raw points accumulated and divided by the total number of points possible. The grading system designated by the college is provided in Table 3.

Table 3

Grading system for GPA calculation

Letter Grade	Percentage	Grade Points
A	92%-100%	4.0
B	83%-91.9%	3.0
C	75%-82.9%	2.0
D	66%-74.9%	1.0
F	65 and below	0.0

The college admission's process required an overall ACT score of 21 for a traditional student and a COMPASS score of 75% in mathematics, 85% in reading comprehension, 85% in English, and 90% in science for the students who had been out of high school for more than 5 years. TEAS examination was given to those students who volunteered and who were admitted from 2009 to 2011. These scores are used for

admission acceptance into the program along with references, high school GPA, previous college GPA, application, and current health records.

Instrumentation

The instrumentation tools used for this study were used to determine whether or not a correlation existed between reading comprehension entrance exam scores and the GPA scores of the first-year nursing student. Creswell (2003) defined an instrument "as a tool for measuring, observing, or documenting quantitative data and to establish or develop an advancement of study, specific questions and responses need to be obtained" (p. 47). I stopped reviewing here due to time constraints. Please go through the rest of your section and look for the patterns I pointed out to you. I will now look at your Section 4.

The ACT measures the student's ability in English, math, reading, and science reasoning. According to ACT, it provides a comprehensive package of educational assessment and career planning services for college-bound students (ACT, 2009). The ACT test consists of 215 questions: 75 are English subject, 60 are in math subject, and 40 are in reading and science subjects. The "test grader" only counts the number of questions the students answer correctly to find a "raw" score (ACT, 2009). The "raw" scores are converted to "scale scores" and then averaged into a composite score. The four sections are weighed equally after the composited score is calculated (ACT, 2009). ACT reliability for reading comprehension scale score median is 0.85, minimum is 0.75, and maximum is 0.97 (ACT, 2009).

A comprehensive, computer-adaptive testing program (COMPASS) quickly and accurately assesses students' skill levels in reading, writing production, math, and English. COMPASS was not used for an entrance score nor does it have a "passing score" (ACT, 2009). COMPASS only indicates an individual's strong and weak areas for the purpose of receiving academic help (ACT, 2009). It provides the college with the information needed to place a student in an appropriate course in order to connect students to resources to achieve their academic goals (ACT, 2009). The COMPASS was used for adults who have been out of high school for more than five years. The reliability of the COMPASS ranges between 0.73 to 0.90 based on the effectiveness of placement of students in an instructional environment (Mellard & Anderson, 2007).

The TEAS is a diagnostic instrument designed to assess four academic profiles of beginning nursing students. This entrance exam is used primarily for adult nursing program applicants. The majority of the items are developed as part of every state's mandated achievement assessment programs and the testing items are developed for nursing specific students. Statistics published by ATI (2008) indicated that the TEAS subtest score reliabilities exceed 80% for mathematics, 70% for English, and 60% for science. There were slight variations in the reliability of the exams between web-based formats and paper and pencil formats (ATI, 2008). According to ATI (2010), the National Association of Nurse Educators validated the study based on the objectives students were required to meet in order to graduate from high school.

The overall general education GPA was the sum of the grade points earned in Anatomy Physiology, English, Algebra, Sociology, and Psychology divided by the total

number of credits in each course. The letter grade in each course was converted into numbers as shown in table 3-1. Multiplying the course grade by the number of credits the course is worth results in the total grade points for the course. To calculate the cumulative GPA, the grade points from each course are added to the number of hours attempted in those classes and divided by the total grade points from the total hours.

Data Collection and Analysis

In this study, I collected data using electronic official transcript information from the admissions office at the local college. Statistical Package for Social Sciences version 17 was used to analyze the data. ACT scores, COMPASS scores, TEAS scores, and grades were collected from the student records and official transcripts and were entered into SPSS. Once the information was entered, bivariate correlation assessed the strength of relationship between two quantitative variables. Pearson product moment correlation is the most commonly used bivariate correlation technique because it measures the association between two quantitative variables (Zagumny, 2001). Bivariate utilizes the correlation between the reading comprehension scores from ACT, COMPASS, and ACT and cumulative GPA, general education GPA, and nursing GPA The data collected enabled a determination of whether reading comprehension scores from entrance exams correlated with the overall commulative GPA of the first year associate degree nursing students success (Zagumny, 2001).

I was an instructor at the private college where the data was collected. I had no contact with the students directly and the family educational rights and privacy act (FERPA) was not violated. Each student who attends the local college signs a permission

form for the faculty and staff to have access to their academic records. Upon approval from the dissertation review board at the college (Appendix A) and Walden University's Institutional Review Board (IRB), the data was numbered and coded and all identifying student markers were removed. The entrance exam scores, cumulative GPA for general education courses, and cumulative nursing courses were obtained from the official transcripts. All data used in this research study will be secured in a locked fire proof safe for a period of five years to which only I have access. Students' names were removed. The students' information was therefore both anonymous and confidential.

Summary

This section described how the study was developed to determine if there are significant correlations between the ACT, COMPASS, and TEAS reading comprehension scores and the cumulative GPAs for the first year associated degree nursing student in total, in nursing classes and in general education classes. A cross-sectional correlation study method was described with data entry into the SPSS v17 to determine the bivariate correlation between the variables. These correlations measured the strength of the relationships between the variables. The sample size and protection of the students as participants in this study were also described. Data analysis is explained in section 4.

Section 4: Results

Findings

In the attempt to determine if reading comprehension scores from entrance exams correlated with the overall cumulative GPA of the first-year nursing student, the Pearson product-moment correlation statistic was used to measure the significance of the relationship and its direction and strength. The descriptive analysis summary of each variable is noted in the following tables.

Table 2

Descriptive Analysis ACT and GPA

	N	Mean	Median	Mode	Standard Deviation
General Education	54	3.246	3.26	4	0.4903
Nursing	54	2.846	3	3	0.5137
Cummulative	54	3.309	3.31	3.07	0.4976

Table 3

Descriptive Analysis COMPASS and GPA

	N	Mean	Median	Mode	Standard Deviation
General Education	54	3.1698	3.28	3.48	0.602
Nursing	54	2.74	2.82	3	0.576
Cummulative	54	3.23	3.345	2.92	0.609

Table 4

Descriptive Analysis TEASE and GPA

	N	Mean	Median	Mode	Standard Deviation
General Education	43	3.01	3.17	3.39	0.585
Nursing	43	2.61	2.73	3.09	0.5933
Cummulative	43	3.07	3.24	2.18	0.596

The correlation between the overall cumulative GPA and the reading comprehension scores did not show a significance. There is no significant correlation between first-year nursing students' overall cumulative, nursing, and general education GPAs and any of the three reading comprehension scores.

Hypothesis 1 predicted that there would be no correlation between ACT reading comprehension scores and overall comulative GPA at the end of the first semester. There were 54 students out of the sample with ACT reading somprehension scores (*n*=54). The correlation was not significant, $r = .236$, $p = 0.86$, and so I accepted the null hypothesis and rejected the alternative hypothesis.

Hypothesis 2 predicted that there would be no correlation between ACT reading comprehension scores and nursing comulative GPA at the end of the first semester. There were 54 students out of the sample with ACT reading somprehension scores (*n*=54). The correlation was not significant, $r = -0.060$, $p = 0.666$, and so I accepted the null hypothesis and rejected the alternative hypothesis.

Hypothesis 3 predicted that there would be no correlation between ACT reading comprehension scores and general education comulative GPA at the end of the first semester. There were 54 students out of the sample with ACT reading somprehension scores (*n*=54). The correlation was not significant, $r = .240$; $p = 0.080$, and so I accepted the null hypothesis and rejected the alternative hypothesis.

Hypothesis 4 predicted that there would be no correlation between COMPASS reading comprehension scores and overall comulative GPA at the end of the first semester. There were 54 students out of the sample with COMPASS reading somprehension scores (*n*=54). The correlation was not significant, $r = .183$,; $p = 0.186$, and so I accepted the null hypothesis and rejected the alternative hypothesis.

Hypothesis 5 predicted that there would be no correlation between COMPASS reading comprehension scores and nursing comulative GPA at the end of the first

semester. There were 54 students out of the sample with COMPASS reading somprehension scores (*n*=54). The correlation was not significant, *r* = .126; *p* = 0.362, and so I accepted the null hypothesis and rejected the alternative hypothesis.

Hypothesis 6 predicted that there would be no correlation between COMPASS reading comprehension scores and general education comulative GPA at the end of the first semester. There were 54 students out of the sample with COMPASS reading somprehension scores (*n*=54). The correlation was not significant, *r* = .182; *p* = 0.188, and so I accepted the null hypothesis and rejected the alternative hypothesis.

Hypothesis 7 predicted that there would be no correlation between TEASE reading comprehension scores and overall comulative GPA at the end of the first semester. There were 43 students out of the sample with TEASE reading somprehension scores (*n*=43). The correlation was not significant, *r* = .121; *p* = 0.439, and so I accepted the null hypothesis and rejected the alternative hypothesis.

Hypothesis 8 predicted that there would be no correlation between TEASE reading comprehension scores and nursing comulative GPA at the end of the first semester. There were 43 students out of the sample with TEASE reading somprehension scores (*n*=43). The correlation was not significant, *r* = .271; *p* = 0.079, and so I accepted the null hypothesis and rejected the alternative hypothesis.

Hypothesis 9 predicted that there would be no correlation between TEASE reading comprehension scores and general education comulative GPA at the end of the first semester. There were 54 students out of the sample with TEASE reading

somprehension scores (n=43). The correlation was not significant, r = .121; p = 0.439, and so I accepted the null hypothesis and rejected the alternative hypothesis.

Sandiford and Jackson (2005) based their model off of Tinto's (year) student integration model and Bean and Metzner's (year) student attrition model. Sandiford and Jackson indicated a significant difference at the p<.001 level for presemester GPA. Students with a presemester GPA of 2.5 or higher had greater retention rates than students with a GPA between 2.00 and 2.49 (Sandiford & Jackson, 2005). In this study, the GPAs were on the higher side. Tinto indicated that dividing students into different groups based on ACT scores, income, gender, and GPA showed no correlation to student retention. My research was similar to a study by Altman, Musselman, and Curry (2010) on academic success, admission criteria in relation to academic and intellectual factors.

Summary

In this section, I presented the results of the research study. There was no correlation between the entrance exam scores and the overall cumulative GPA of entering nursing students and the either the nursing GPA, or the general education GPA of the first-year associate degree nursing student. This conisides with Tinto's model i that dividing students into different groups based on ACT scores, income, gender, and GPA showed no correlation to student retention. All null hypotheses were accepted for this study.

Section 5: Discussion, Recommendation, and Conclusion

Overview

Associate degree nursing programs are concerned about low retention rates and the factors that contribute to student success, especially in light of the recent shortage of nurses in the United States (Hopkins, 2008). Researchers have attempted to determine if high school grade point averages, entrance exams, and cumulative college grade point average can successfully predict how successful a student will be. This study sought to determine if there was a correlation between reading comprehension entrance exam scores and the overall cumulative GPAs, the nursing course GPAs, and the general education GPAs of the first year associate degree nursing student. The data was collected from electronic official transcripts and student records from the admissions office at the local college. Tinto's model indicated that dividing students into different groups based on ACT scores, income, gender, and GPA showed no correlation to student retention. The model used by Tinto was mainly based on income, gender and ACT scores. He did not limit his study to reading comprehension scores and GPA correlations. The findings indicated there is no correlation between overall cumulative GPA, nursing GPA, or general education GPA with reading comprehension scores.

Findings

Belfield and Crosta (2012) used student data from a community college to evaluate literacy placement test findings and reported that the assessments did not provide an accurate prediction of school success. In my study, reading comprehension scores from entrance exams do not correlate with the overall cumulative GPA. The

statistical analysis in this study demonstrated that there is no evidence to prove that reading comprehension scores from entrance exams affect how successful the first year nursing student will perform in an associate degree program as measured by GPA. Hodara, Jaggars, and Karp (2012) supported theses findings and added that inconsistent standards among different colleges leads to student failure. According to Tinto (2005), academic indicators of a student's educational goal include grade performance and intellectual development as well as social interactions such as peer group and faculty interactions. The finding of this study did not show that the pre-admission criteria used to predict academic success of students in their first year of nursing school was accurate. Entrance exam reading comprehension scores do not determine how successful a nursing students will be in their first year of school at the college where the study was conducted. There is little research on entrance exam reading comprehension scores and their predictive value of nursing student success in the first year nursing student. This study will help to fill the gap in the literature and in professional practice.

In 2005, ACT reported that only 51% of high school graduates were ready for college-level reading and that more students were on track to being ready for college level reading in eighth and tenth grade then by the time they reached twelfth grade (ACT, 2006). ACT (2006) college readiness benchmark in reading represents the level of skill required for students "to have a high probability of success" in college courses (p. 1). ACT test scores demonstrate what students learned throughtout hight school and provde colleges with information for retention, advising, placement, and advising (ACT, 2006).

There is little research on ACT scores and the success of the first year nursing student. The literature review for this section is based on ACT and success on NCLEX-RN.

Reason (2004) conducted research to assess the predictive ability of the ACT index score in relation to college level student retention. The findings from the research indicated that the ACT index was a "significant predictor of retention" (Reason, 2004, p. 184), but was not as predictive as the individual ACT composite score. Reason's study failed to support findings by earlier researchers supporting the use of the ACT index score (Reason, 2004). This study showed no correlation between reading comprehension scores and cumulative GPAs.

COMPASS is given to incoming freshman who have already been admitted to assist colleges in evaluating students skills and place the student into an appropriate course (ACT, 2006). Bailer's (2006) study on student retention reported that 66% of students whose COMPASS scores required remediation in math (n=274) were female (p.111). In addition, 62% of students whose COMPASS scores required remediation in writing (n=86) were female (Bailer, 2006). The sample size of students requiring remediation in reading was so small (n=20) that no significant conclusions could be drawn. Bailer's findings supported the recommendations of Schaid (2001) and Chang (1998), while presenting gender specific data on COMPASS scores and remediation. This study did not show a correlation with the COMPASS reading comprehension score and GPA.

According to ATI, the TEAS test was designed to predict those students with the highest chance of being academically successful prior to admission into a nursing

program. A study by Newton, Smith, and Moore, (2007) indicated that the TEAS exam was able to predict first semester program success and that it was a more reliable predictor for success in the first year than pre-nursing GPA. TEAS test is conducted by the Assessment Technologies Institute and the organization collaborates to assist nursing programs in testing. TEAS entrance exam is used to provide colleges information on incoming students efficiency of logical thinking, medical advice and proper care provider to the society (Assessment Technology Institute, 2008). In this study the TEAS reading comprehension score was used and not the overall score.

Limitations

An identified limitation in this study is that the participant sample was not studied according to age, gender, or race. The study sample consisted of a small group of students who ranged from freshman to sophomore year who enrolled in a local college during a discrete period of time. Limiting the size and location from which the data was taken could have influenced the results. Other variables that might have affected the outcome of the study include socioeconomic status, student employment, teaching styles, learning environment, and family responsibilities. The local college does allow the students to take the entrance exams several times to improve their score which may have scewed the results of this study.

Implication for Social Change

The nursing progession is experiencing a critical shortage of qualified registered nurses. Auerback, Buerhaus, and Saiger (2011) suggested that future nursing shortages will depend on the health care needs of the society. Accrediting agencies monitor

nursing programs for overall student success (Grace & D'Aoust, 2006). It is important for educational leaders to understand the causes of low retention rates so that they will not lose their accreditation. Nursing programs are exploring intervention to increase their retention rates in order to decrease college costs, improve faculty effort and time developing the courses, decrease administrative resources, and to continue their accreditation. The completion of an ADN program of study, while challenging, can lead to a rewarding and varied career. However, failure to complete the nursing program or delayed graduation after acceptance to nursing coursework is costly to the student, family, the program's institution, and society (Grace & D'Aoust, 2006). This study found that academic success of students did not correlate to ACT, TEAS, or COMPASS reading comprehension scores. Perhaps focusing on different standardized tests would yield different results. Students might retake the entrance exams several times in order to achieve an acceptable score to be admitted to a college or university. The cost of entrance exams range from $54.00 to $20.00 (ACT, 2006).

This study sought to determine a correlation between overall cumulative GPA, nursing GPA, or general education GPA with reading comprehension scores. The findings revealed that the tests used to admit students to the nursing program were not predictive of determining the success of the first year nursing student in an associate degree nursing program. Therefore, this study will serve to inform the associate degree nursing program that more research needs to be done to determine what may determine the success of the first year nursing student. A more diverse set of admission criteria for

acceptance to the program would assist the admission committee to find the right candidates from the beginning.

Recommendations

More studies are needed on the relationship between reading comprehension and nursing courses. Byrd, Garaza, and Nieswiadomy's (1999) study used the Nursing Entrance Test (NET) which showed a positive relationship between reading comprehension and success in nursing courses. Early identification of risk factors can deteremine if a student will be successful in a nursing program. Even though nursing programs have competitive admission processes, the students who are accepted could be at risk for not completing the program. It is essential for nursing programs to identify and develop strategies to help those students who are risk of not completeing the program. A recommendation will be made to that a committee be formed to look at similar programs who have successful outcomes to see what admission criteria those institutions use.

The admission committee of the local college will be informed of the results from this study and a recommendation will be made to other criteria for admission to the nursing program. Repeating this study to see ifvariables such as annual income, support system, and number of hours the student works in a week while attending school correlates with admission tests should be considered. Social and emotional components related to student success might transcend placement exams. Replicating the study at other colleges and universities to compare the data from this study may add to the reliability and validity of my study. Future studies are needed on reading comprehension

and academic success with initial nursing courses in terms of cultural factors, peer interaction, and self-motivation. Hughes and Scott-Clayton (2011) stated learning problems and poor instruction were potential causes of low achievement scores so these variables might be worthy of studying at the local institution.

Conclusion

This study showed that the entrance exams used to predict academic success of first year nursing student in an associate degree program were not reliable. More studies are needed to determine possible risk factors in student academic success. Future research on reading comprehension and academic success will benefit universities in determining the success of a first year nursing student. Based on the results of this study, I plan to research other risk factors, related to freshman nursing student success so that theses students will receive the support they need to realize their goals.

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Southeast HEALTH
College of Nursing & Health Sciences

December 17, 2013

Laura Lottes, MSN, RN
3018 Melrose
Cape Girardeau, MO 63701

Dear Laura:

This letter is to confirm approval for you to collect data (entrance exam scores and grade point averages) for nursing students who attended our associate degree nursing program 2009 through 2011. The Committee approved your request Thursday, October 11, 2012. Approval remains effective. It is our understanding that student names will not be used and that you will keep all student records confidential. Please contact me to make arrangements when you are ready to collect the data.

I would appreciate your sharing results with me upon completion of your study. Best wishes as you proceed.

Sincerely,

Tonya L. Buttry

Tonya Buttry, PhD, RN
President
Southeast Missouri Hospital College of Nursing and Health Sciences

c: Dr. Shirrell