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Pre-Entrance Factors and Student Success in an A.A.S. Nursing Program

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A dissertation

presented to

the faculty of the Department Educational Leadership and Policy Analysis

East Tennessee State University

In partial fulfillment

of the requirements for the degree

Doctor of Education in Educational Leadership,

concentration in Higher Education Leadership

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by

Connie Marshall

December 2020

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Dr. Donald Samples

Keywords: academic success, A.A.S. nursing program, HESI-A2, attrition

## ABSTRACT

### Pre-Entrance Factors and Student Success in an A.A.S. Nursing Program

by

Connie Marshall

The purpose of this study was to evaluate the relationship of pre-entrance factors and the success of students in an Associate of Applied Science (A.A.S.) degree nursing program at a community college in East Tennessee. The criterion variable was success in the nursing program. Success was defined as academic success in all nursing courses and completion of the nursing program to graduation. The predictor variables of pre-entrance factors were gender, age, Health Education Systems, Incorporated (HESI) A2 scores, Pell Grant eligibility, pre-nursing GPA, and prior licensure. The data for this non-experimental secondary analysis were derived from the electronic database in the community college Banner system. The population of the study consisted of all students accepted into the A.A.S. Nursing Program at a selected community college for academic years beginning 2013-14, 2014-15, and 2015-16. The population of the study was approximately 300 students. Analyses of the data were completed using independent samples t-test and chi-square cross tabs. Findings revealed that the mean HESI A2 scores were higher in those students that successfully completed the Nursing program than those that did not complete the program. Findings revealed a statistical significance between gender and program completion with females more likely to successfully complete the nursing program than male students. The factors that had no significant relationship to successful completion were age, high school GPA, Pre-nursing GPA and holding prior licensure. Findings also revealed students who

are Pell eligible were not significantly more likely to complete the nursing program than those students who were not Pell eligible.

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## DEDICATION

This work is dedicated to my family, friends and coworkers who have supported me on this journey.

## ACKNOWLEDGEMENTS

I would like to extend my sincere appreciation to my doctoral dissertation chair, Dr. Don Good and my dissertation committee Dr. Jill Channing, Dr. Jim Lampley, and Dr. Donald Samples for their continued support and guidance throughout this process.

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## Chapter 1. Introduction

Registered Nursing is listed among the top occupations in terms of job growth through 2024, according to the Bureau of Labor Statistics (Bureau of Labor Statistics, 2017). Additionally, the job openings due to replacement nurses is also due to grow by 16%. The total number of unfilled nursing jobs is expected to grow to 1.09 million by 2024. Although the occupation is growing, the number of nurses to fill those positions is decreasing. The nursing shortage is expected to intensify as baby boomers age and get closer to retirement. Requests for nursing programs to produce more graduates has intensified. Nursing programs are selective admission programs, students must apply to be accepted into the program. Student acceptance is contingent on scoring enough points based on the pre-entrance factors. The program is cohort based and students are only accepted one time per year, therefore students who are academically unsuccessful during the program result in a decreased number of students that graduate. A decreased number of nursing graduates ultimately decreases the productivity of the nursing program and proportionally decreases the number of nurses entering the workforce for patient care (Long, 2014).

This study is focused on the relationships between pre-entrance factors and the success of students in an Associate of Applied Science (A.A.S.) degree nursing program at a community college in East Tennessee. Success is defined as academic success in all nursing courses and completion of the nursing program to graduation. Many studies have been conducted regarding the academic outcomes of nursing students in B.S. degree programs, but few that specifically address success in A.A.S. degree nursing programs. Nursing programs generally experience a significant student attrition rate between acceptance into the program and successful completion of the program. Research by Long (2014) suggests there are several factors leading to student

attrition ranging from academic unsuccessfulness to the extrinsic burden of life responsibilities. Academic success is a factor in student retention in nursing programs and increasing the number of new graduate nurses produced is becoming a priority in nursing education (Long, 2014). This study will concentrate effort on evaluating academically unsuccessful variables. To obtain the needed data, a quantitative non-experimental study will be conducted using secondary data analysis. The information gleaned from this study could be beneficial to the acceptance committees of A.A.S. degree nursing programs if certain factors are shown to be indicative of success.

This study seeks to evaluate variables that could indicate success in this demanding program of study. Included will be students admitted into the nursing program that have completed the LPN to RN bridge program. These students have prior licensure and experience in the field of nursing. The LPN students have completed education, training, and successfully obtained the Licensed Practical Nurse or LPN certificate. These students will have successfully completed the NCLEX LPN test. Students accepted into the LPN to RN bridge program must take an introductory course in which they will receive didactic instruction and must successfully pass skills exams to prove their competency of basic nursing procedures. Students who successfully complete the bridge program course will join nursing students in their second year of the A.A.S. nursing program. Students with prior licensure as an LPN have acquired healthcare knowledge and skills prior to acceptance into the nursing program. The study will observe if these students are uniquely qualified for success due to their previous experience working in the field of nursing.

Nursing Program admission committees must be able to fairly and consistently evaluate all applicants using multiple variables. Standardized tests such as the Health Education Systems,

Incorporated (HESI) A2 offer methodological rigor and provide a consistent way to measure the student's achievement and ability (Murray et al., 2008). Researchers propose that the ability to assess academic ability of nursing programs applicants is paramount to selecting the best students for the limited number of seats in the program.

### **Statement of the Problem**

Nursing programs' attrition and retention rates have been significant issues in undergraduate nursing education programs globally (Long, 2014; Merkley, 2016). The results of this current study may identify gaps in the existing literature that could assist nursing programs in accepting students that have indicators for success in the program. Identifying gaps such as academic or non-academic indicators may allow nursing programs to construct supportive programs or measures to retain students to graduation. Identifying gaps in literature may help nursing programs look more closely at academic factors such as minimum GPA in high school or pre-nursing courses and which courses students completed prior to making application to the nursing program. Student success in this study is defined as successful completion of all required general education and nursing courses with a final grade of "C" or better and are eligible to graduate. Student profile characteristics or variables may show if any are indicative of success. As an example, if the variable of gender is found to be less successful, all students would be offered supportive measures, not necessarily just male or female. Any student variables that correlate with weakness in a particular area could be referred for supportive measures to improve retention rates. Concentrated efforts toward variables related to academic unsuccessfulness could lead to increased retention to graduation rates for the nursing program. Nursing student retention to graduation is a performance measure that each nursing program and college needs to address, possibly to maintain funding (Merkley, 2016). Additionally,

nursing student success is significant as nursing graduates are then ready to fill the growing number of vacancies in the workforce. The population is living longer and requiring additional health interactions; the shortage of nurses is affecting the ability of healthcare agencies to handle the aging population (Merkley, 2016).

### **Research Questions**

This study sought to examine variables that could indicate success in the demanding program of study, nursing. Additionally, this study attempted to provide information as to the relevant factors for student academic success to graduation. The study was guided by the following research questions.

Research Question 1: Is there a significant difference in nursing students' mean HESI A2 scores between successful program completers and non-completers in an A.A.S. nursing program?

Research Question 2: Is there a significant relationship between student gender and program completion in an A.A.S. nursing program?

Research Question 3: Is there a significant difference in student age between program completers and non-completers in an A.A.S. nursing program?

Research Question 4: Is there a significant relationship between Pell Grant eligibility and program completion in an A.A.S. nursing program?

Research Question 5: Is there a significant difference in high school GPAs between successful program completers and non-completers in an A.A.S. Nursing Program?

Research Question 6: Is there a significant difference in pre-nursing GPAs between



program completers and non-completers in an A.A.S. nursing program?

Research Question 7: Is there a significant relationship between program completers in an A.A.S. nursing program and whether or not they had prior nursing licensure?

### **Significance of the Study**

There is a nursing shortage that is affecting the quality of healthcare (Long, 2014). While a variety of factors contribute to the nursing shortage, addressing attrition rates of students in nursing programs has the potential to positively impact the nursing shortage. The impact of adding new graduate nurses into the healthcare work force could fill the current and future void of nurses. Identifying student success variables for the nursing program admission criteria to use, has the potential to improve retention to graduation in nursing programs by selecting the best candidates. Academic success to graduation could decrease the nursing shortage by producing more new nurses. Identifying student success variables and using that knowledge as a resource is an intervention with possible positive implications. Long, (2014) affirmed that variables that affect student retention to successful completion of nursing programs are generally not well understood. The significance of this study will be to provide data to A.A.S. nursing programs as to the relevant factors for student academic success to completion.

### **Theoretical Framework**

This dissertation aims to study the pre-entrance factors and student success in an AAS Nursing program at a community college. The Nursing program studied is a selective admission program, in which students must complete specific steps and submit documents that garner points for ranking and acceptance. Points are awarded for the grade point average of specific pre-nursing courses and a score on a standardized pre-entrance test. Nursing programs strive to accept students with the best possible chance for success in the

program. Students are ranked by the number of points they earn and the top ranked students are accepted into the nursing program. Retention to graduation is a much discussed topic within Nursing programs (Abele et al., 2019; Riley, 2019). Additionally, the pre-entrance criteria of nursing programs are widely discussed in the realm of retention to graduation (Harding et al., 2017; McEnroe, 2011). Nursing program admission committees compare their pre-entrance variables with other programs and review current literature for needed changes.

The rationale for this dissertation was a concern of placing so much emphasis on a standardized test score as an entrance criterion. Although studies by Murray et al. (2008) have linked HESI-A2 test scores with success in a nursing program and as a valid predictor of academic ability, the presumption is that a standardized test can evaluate factors to predict that a student has the knowledge and abilities to persevere the rigors of a two-year nursing program. Additional predictor pre-entrance elements reviewed are grade point average from high school, from specific college level courses and pre-licensure as a Licensed Practical Nurse. Research by Long (2014) suggests that there are several factors leading to student attrition ranging from academic unsuccessfulness to extrinsic burden of life responsibilities. This present student explores factors that determine whether students are able to overcome obstacles and complete a rigorous community college nursing program.

Reviewing a student's past body of work may only be one part of the retention equation. A review of student persistence in college models may be supportive in this theoretical framework. The idea of student persistence may clash with the predictor factors of pre-entrance criteria. One such persistence model by William G. Spady outlines

academic factors of retention for students as academic and social and further delineates academic as grades and intellectual development (Spady, 1970). Spady's model was one of the first and gave rise to Tinto's theory of Institutional Departure. Tinto's model (Tinto, 2006) expanded on the social aspect of student persistence and outlined the importance of the student's ability for social integration in the college. Tinto's model included faculty and staff interaction with the student as a component of Academic Integration. Peer group interactions were also noted as a component of social integration by Tinto (Tinto, 2006). Tinto's model further posits that central to student motivation to remain in college was a student's self-efficacy, sense of belonging, and perceived value of the curriculum (Tinto, 2016). Becoming a nurse often aligns with student's personal values and gives worth to the curriculum; the sense of belonging is encouraged by the nature of a cohort program.

In 1980, John Bean created an additional model for student persistence, a student attrition model. Bean's work included GPA, and career relevance as major attributes. A more important model related to this study was Bean's model for nontraditional undergraduate student attrition. Bean's model for commuter students, such as community college students, relayed the social aspect was not as important to this group of students. Bean conveyed that the environmental variables of finances, hours of employment outside of school, and family responsibilities led more directly to stopping out of college. Institutional integration did not play a major role in the commuter group of students and their persistence to completion. Most early models (Spady, 1970; Tinto, 2006) cite variables for student attrition, and factors leading to stopping out. The intent of this present study is to evaluate pre-entrance variables and pair these findings with the early persistence theories to strengthen the college's efforts for student success.

This study is using student data from three academic years of nursing program students. By reviewing the data, the aim is to show which variables correlate with the students that successfully completed the nursing program. The nursing program will use the data in future years to attempt to accept students with the best possible chance to complete the program successfully. Additionally the data may guide the college in what specific extra supportive measures may need to be added throughout the program to increase retention. Tinto stated “it is important that institutions challenge existing labels that mark some students less likely to succeed and equally as important that those students obtain timely support to enable them to succeed when they first encounter early difficulties of academic or social demands” (2106). Careful review of the data and results of this study may enhance not only the use of correct variables, but also strengthen the program as a whole.

### **Definitions of Terms**

The following terms are used throughout this study.

1. Grade Point Average (GPA): The conversion of letter grades to a 0.0 to 4.0 numerical scale. A cumulative GPA is the average of all final grades accumulated on courses taken at an institution (Lindsay, 2018).
2. Health Education Systems, Inc. Test (HESI A2 Test): A standardized admissions test with nine main categories that is often used by nursing programs to assess specific variables of the students’ academic preparation (Mometrix Test Preparation, 2018).
3. LPN to RN Bridge Program: Educational mobility programs designed to quickly and efficiently assist licensed practical nurses (LPNs) who want to advance their current educational level (Birkhead et al., 2016).

4. Non-traditional Undergraduate Student: A student who may have delayed enrollment in college after high school, typically works full time, often has dependents, may be a single parent, and typically, age 25 and above (Choy, 2012).
5. Pell Grant: A form of federal financial aid for students who have demonstrated financial need. This grant is awarded by the Department of Education and does not have to be repaid (Kerr, 2019).
6. Traditional Undergraduate Student: A student who has earned a high school diploma, enrolls full time immediately after finishing high school, depends on parents financially, and either does not work, or works only part time and is typically age 18 up to 25 (Choy, 2012).

### **Delimitations and Limitations**

This study is limited to those students who were admitted into the A.A.S. Nursing program at one community college in east Tennessee. Findings of the study may not be indicative of all A.A.S. nursing programs. The study is further limited by assuming the data collected and managed by the Institutional Effectiveness Office were accurate. Additional limitations include that there was a consistent and academically strong applicant pool of students during the years of the program studied and all GPA's are computed in the same manner.

This study is delimited as it did not include variances of success as related to different instructors assigning grades in the nursing courses. Further the study is delimited by including students with prior LPN licensure and those who have no prior nursing licensure. Additional delimitation includes that there were consistent methods for assigning grades in the nursing program during the years of the program that were studied.

## **Overview of the Study**

Chapter 1 provides an overview of the study while providing rationale for the importance of the study. The nursing shortage and importance of producing more nursing graduates is examined. Chapter 2 is a review of literature that highlights nursing program attrition, student success indicators and ramifications of non-success. Chapter 3 identifies research methodology, variables studied, research design and population. Chapter 4 presents the findings of the study through charts and graphs. Interpretation of the data is also included in Chapter 4. Chapter 5 includes the findings and any relevant conclusions for student success. Implications for future research and practice will also be presented in Chapter 5.

## Chapter 2. Review of Literature

The face of nursing students is changing as a large number of nursing students are attending as a second career and the average age of a nursing student increased by six years within a six-year span, and is now 31 years of age (Olin, 2011). Two-year nursing programs are the major supplier producing approximately 60% of nursing student graduates (Staykova, 2012). With limited seat capability, most nursing programs must strive to admit those students who have shown their capability to succeed in a rigorous nursing program.

The challenge of nursing programs is to assimilate the correct information to help select which students should gain admission. Most nursing programs have a set of pre-entrance criteria that the student must meet to make application to the program. Nursing programs must optimize nursing entrance criteria and selection strategies (Lancia et al., 2013). Nursing program admissions committees need to identify the significance of pre-entrance factors to admit the best possible candidates and decrease the number of students that fail to successfully complete the program. Findings from this study indicated that the HESI A2 pre-entrance test was a valid predictor of students' academic ability to succeed in the A.A.S. nursing programs (Murray et al., 2008).

Research indicates that in addition to nursing curricular rigor, negative faculty interaction and clinical placement are shown to be factors that cause student attrition in nursing programs (Eick et al., 2012). Student unsuccessfulness in the program, or often known as student program attrition, is defined as the difference between the number of students accepted into the nursing program and the number that successfully completed on time (Eick et al., 2012). Some health care systems are looking to higher education to provide educational mobility or seamless academic progression for LPN's in the workforce to proceed on to higher levels of RN to increase the number of new nurses (Birkhead et al., 2016).

Nursing student attrition is a topic of interest for nursing programs. A study by Abele et al. (2013), evaluated whether success on specific courses could be used as success predictors. Program administrators seek data on success to retain as many students as possible. Literature reviews indicate many undergraduate nursing program attrition rates are as high as 50% (Merkley, 2016). Nursing program attrition rate is an international problem, with nursing programs in the United Kingdom relaying similar issues and attrition rates over 30% (Abele et al., 2013). High attrition rates increase nursing program costs as resources and time are devoted to students that do not successfully complete the program (Olsen, 2017).

Nursing programs use many different admission criteria to evaluate students. Program admission criteria should ensure selecting students that have the ability to successfully complete the program, although many do not (Griswold, 2014). The goal of the pre-entrance criteria is to help the admissions committee members in dividing those students that have shown academic relevance and are more likely to complete the program on time. Some institutions require designated general education courses to be complete prior to making application to the nursing program. Studies attempt to identify which pre-requisite courses can be used as predictors of success for nursing program entrance (Abele et al., 2013). Nursing programs may require a specified minimum GPA status on those pre-requisite courses as a part of the pre-entrance criteria. Nursing programs seek to close the gap between attrition, students stopping out after acceptance and retention to program completion (Abele et al., 2013; Griswold, 2014). Nursing programs may use scores on standardized entrance test to assess the students' academic readiness for the rigorous curriculum of the nursing program. There are many different standardized tests that correlate to the academic subjects that nursing programs need students to have mastered. Nursing programs choose which test to use for their pre-entrance assessment. This literature



review will assemble the previous research for evidence of student attrition in an A.A.S. nursing program and identify potential gaps in the literature. Nursing program faculty need to address academic issues causing student failure to progress in the program.

### **Nursing Shortage**

Retention of nursing students not only affects nursing programs, but the healthcare of that community (Griswold, 2014). Nursing is one of the fastest-growing occupations in the country and yet the demand for nurses is greater than the supply (Staykova, 2012). There are currently more citizens over the age of 65 than at any other time in U.S. history (Grant, 2016). As baby-boomers age, they also have more health issues; most have multiple chronic health issues. As a whole, the population is surviving longer but requiring more healthcare services (Haddad, & Toney-Butler, 2019). Additionally, one third of the nursing workforce will be at retirement age between 2026 and 2031; and further complicating the issue, this number includes faculty in nursing programs (Grant, 2016). The nursing faculty shortage is felt across the country with around 1,565 positions noted as vacant in 2018 (Blitchok, 2018).

With the growing need for nurses, and the shrinking number of available nurses, the burden of adding more nurses to the workforce is falling to nursing programs to correct the deficit (Blitchok, 2018). Healthcare systems may work closely with nursing programs to recruit students before they graduate. The potential of a job upon graduation, while it is motivating, also offers some additional pressure to the student.

Snavelly (2016) speculates that the nursing shortage will also have economic ramifications for the United States. Additional factors for the nursing shortage as outlined by Snavelly are:

- A return to pre-recession work levels, aging baby boomers, and insufficient numbers of nursing graduates adversely affect the supply of nurses.
- The aging population, a rise in chronic care management needs, and the Affordable Care Act will result in an increasing demand for nurses.
- Returning to a state of equilibrium is critical if our health care system is to ensure care that is accessible, safe and cost effective. (p. 98)

Throughout history, nursing shortages and surpluses have occurred. Nursing shortages have long been contributing factors for higher infection rates and patient to hospital readmissions (Rosseter, 2017). In addition to less effective patient care, the nursing shortage also affects the economy as the average cost of turnover from the loss of a bedside RN to the hospital is \$36,000 to \$57, 000 to replace that position (Snavey, 2016). Statewide initiatives are underway using economic grants as funding to entice nursing program graduates to remain in the area and or to teach in nursing programs (Rosseter, 2017). Key stakeholders, such as nursing programs, legislators, and hospital systems will all need to work together to create multiple methods to address the nursing shortage for the quality of healthcare as well as the economic issues that it causes (Snavey, 2016). The community college plays an important role in the nursing shortage as they supply approximately 60% of nursing student graduates (Staykova, 2012). The quality of healthcare is affected by increased bedside nurse turnover (Snavey 2016) and patient readmissions (Rosseter, 2017).

## Success Factors in Nursing Programs

### Academic

Students may enter college and nursing programs ill prepared for the increased rigor of nursing courses and the need for independent motivation to succeed (Griswold, 2014). Some research indicates the reason for high attrition rates in nursing programs is students do not have the solid foundation in reading, writing, and mathematics that is needed to be successful with the rigors of a nursing program (Staykova, 2012). Although recruitment in nursing programs is important, nursing faculty must have the tools and strategies to retain those nursing students who are not academically prepared. Data obtained from a study by Murray et al. (2008) indicated that the HESI A2 was a reliable instrument and that it was a valid predictor of academic success in the participating A.A.S. and BSN programs.

Nursing programs that accept academically at-risk students may need to consider remediation initiatives during the program. For example, Carrick (2011) noted that switching from a lecture format to more student centered activity methods can assist students to be successful in nursing programs. A remediation plan scheduled at optimum times during the nursing program may help to retain those academically challenged students (Myles, 2018).

Carrick (2011) provides the following elements of a strong student support system:

- Early identification of students
- Test anxiety counseling
- Student support/study groups
- Mentoring Sessions: faculty to student ratio of 1 to 8 with weekly meetings
- Peer Tutoring groups
- Structured Learning Assistance provided by the college

Appropriate advising by faculty can provide the aid that nursing students need with academic success and program progression (Staykova, 2012). Nursing students' abilities to overcome academic pressure is known as academic resilience (Hwang, 2018). Stoffel and Caine (2018) confirmed that empowerment and stress resilience were positive indicators for students in healthcare programs, suggesting those who had them would feel more in control of their situations, which would lead to academic success. Academic resilience may be correlated with persistence in a nursing program (Hwang, 2018). Prior studies have indicated that academic resilience was demonstrated through class participation, high grades, and less evidence of academic exhaustion when faced with the rigors of the nursing program. For example, Stoffel and Caine (2018) studied the concepts of grit and resilience as it related to student success in health care programs; these traits were necessary for students in healthcare programs for their ability to persevere, meet goals, and deal with disappointment.

Most nursing students who successfully graduate from a nursing program are successful on the NCLEX-RN test (Carrick, 2011). Some students are not and have indicators throughout the program that they may not be successful even if they graduate from the program. Failure of the NCLEX-RN testing can have emotional and financial consequences for the new nursing graduate. Studies have been undertaken to discover the nonacademic and academic risk factors for first-attempt failure of the NCLEX-RN test (Carrick, 2011; Lutter, 2017). A deeper approach to learning and change of learning strategies by the student may lead to increased success on the NCLEX-RN test (Carrick, 2011). Academic factors that correlate with such failure have been identified as low overall GPA, lower grade point average in required science courses, and low scores on the NCLEX readiness tests (Lutter, 2017).

Academic Success is a factor in student retention in nursing programs. Retaining students to graduation is becoming a priority in nursing education (Long, 2014). The acceptable minimum percentage of passing graduates is set by the state board of nursing. To assure consumers that a school of nursing in Tennessee is providing education that prepares nurses to competently practice and successfully pass the National Council Licensure Examination (NCLEX) a program first time pass rate of 85% has been established (Tennessee Department of Health, 2019).

Most studies define nursing program attrition as loss of students who are accepted into the program, but stop out or withdraw during the program (Abele et al., 2013; Carrick, 2011; Lutter, 2017). Specific student outcomes serve as feedback to determine the effectiveness of the nursing program and the ability of the nursing graduate to be successful. Factors that are evaluated include test scores, grade point average and standardized test scores. Research has indicated that science course grades may be scrutinized as predictors of student success in a nursing program (Abele et al., 2013). Students may have indicators such as low test scores during the nursing program that indicate their future struggles to pass the NCLEX- RN exam at program completion. Nursing programs may need to consider those students who have early indicators to provide extra support such as peer or faculty tutoring to those at risk students. Additionally, electronic test preparation resources may also be used. Nursing instructors may elect to include more questions on routine tests that challenge higher levels of learning such as analysis and application, therefore exposing students to more advanced test questions such as those on the NCLEX-RN tests (Carrick, 2011). Educators must find the balance between supporting the students, while challenging them to take responsibility for their education rather than handholding them through rough times (Stoffel & Caine, 2018).

## **Non-Academic**

When nursing students are not academically successful, there are many ramifications. The college has fewer students to graduate, and there are fewer graduates to fill the void of nurses in the clinic setting (Pugachov et al., 2015). The number of students who leave nursing programs due to academic reasons is relatively small, as most cite personal issues, childcare, finances, or the rigors of the nursing program as their reason for leaving (Griswold, 2014). Educators have also identified that the psychological stress of exposure to death or severe illness during clinical internships is traumatic for the student and may lead to the student withdrawal from the program (Stoffel & Caine, 2018).

McKendry et al. (2014) pointed to the importance of conveying clear information of the risks of non-academic pressures on students. Students need to have a full understanding of the program demands that will be placed on them in addition to their family responsibilities and part time work. Students who receive Pell Grant funds are thought to be able to work fewer hours for pay which lessens the financial burden for the student (Park & Scott-Clayton, 2018). Faculty members tend to link poor attendance, including multiple absences and tardiness, with students who did not complete nursing programs (Harding et al., 2017).

In addition to the time management of nursing students who juggle family responsibilities and work commitments, the lack of support is noted in many studies to be a reason for student withdrawal. Students who voluntarily withdrew from a nursing program due to personal factors but were readmitted later appeared to be successful if they were in good academic standing when they left (Harding et al., 2017). Students who feel they have support from program faculty and feel valued by the instructors rely on that support and may use it as a reason for remaining in the

program (McKendry et al., 2014). Students who feel they have little or no family support are less likely to remain in the nursing program (McEnroe, 2011).

Three sources of support have emerged from literature and can contribute significantly to nursing student's ability to remain in the program. They are role models in the profession, supportive program faculty, and a close peer group (McKendry et al., 2014). Early identification of nursing students who are struggling, and additional support provided by faculty is essential to retaining those students (McEnroe, 2011). Attention to the needs of the struggling nursing student by faculty is an extension of the caring behaviors exhibited by the nursing profession. Students who feel they have faculty support during a nursing program are more likely to remain in the program and be successful (Abele et al., 2013). Additionally, if students are unsure of their abilities to cope with the stress during the nursing program, they may believe that withdrawal is their best option (McKendry et al., 2014).

Studies indicated that the nursing students perceive the most important attributes of nursing faculty include technical skills and knowledge base, good communication with other faculty and students, and displaying a caring attitude (Abele et al., 2013; Oh, 2019). Nursing faculty may need to support students by displaying the caring attitude toward them in an effort eliminate their thoughts of program withdrawal (Abele et al., 2013).

Nursing students who experience high levels of stress during the program are more likely to be unsuccessful in the program. It is noted that college students feel increased anxiety levels and decreases in the sense of control of their lives (Gray, 2015). Students who are committed to the nursing profession, but due to their inability to adapt to the stress of the program, they may be more likely to believe they do not have the abilities to succeed in the career and subsequently withdraw from the program (Riley, 2019). Faculty also need to realize that student confidence

and growth is achieved by finding the balance between support and challenge of the students (Gray, 2015).

### **Student Gender in Nursing Programs**

Enrollment of male students in Bachelor of Science in Nursing (BSN) programs decreased by 1% between 2012 and 2016 (NLN, 2016). Female nursing students have lower attrition rates than male nursing students (Sienkiewicz, 2013). Successful academic achievement in nursing programs by gender has not been widely studied. An exception is a survey by the National League of Nursing which compiles data on the gender of nursing students and is readily available to nursing programs (NLN, 2016). Overcoming stereotyping issues and perceptions will need to be overcome by the nursing profession to increase the number of males considering nursing as a career (McDavid, 2018).

Therefore, discovery of factors that increase the success of male nursing students could have potential to increase nursing program overall retention rates. The addition of male RNs into nursing program faculty roles would provide positive recruitment of male high school students into nursing programs (McDavid, 2018). In the United States, but not some other countries, men are underrepresented in a nursing career (McKenna et al., 2016).

Although nursing gender is commonly thought of as female dominated occupation, the national trend is transitioning to more male inclusion (Dante et al., 2016). Although not specific to nursing programs, researchers (e.g. Guiffrida et al., 2013) suggested female students graduate from college at significantly higher rates than their male counterparts. Furthermore, male nursing students tend to express confidence in their leadership abilities and viewed support services as a less important aspect of nursing school as did their female counterparts (Hoffart et al., 2019). Male students have reported that they felt a sense of awkwardness when entering the nursing



profession due to stereotypical beliefs that males are less caring and compassionate; a tendency that may lead to a decreased number of male nurses (McKenna et al., 2016). Research (e.g. McDavid, 2018) has indicated that male nursing students relay the lack of male nursing faculty and role models create a sense of isolation in the nursing school environment.

### **LPN to RN Bridge Programs**

Some nursing programs include a Licensed Practical Nurse (LPN) to Registered Nurse (RN) bridge program. Programs are aimed at allowing licensed practical nurses (LPN) or diploma nursing program graduates a mobility articulation pathway to attend a Registered Nursing Program (Murdock et al., 2000)). Such educational mobility programs are designed to quickly and efficiently assist those that want to advance their current educational level (Birkhead et al., 2017). Programs in Tennessee are accredited by the Tennessee Board of Nursing and prepare students to sit for the National Council Licensure Exam for the Registered Nurse at successful program completion (Tennessee Department of Health, 2019). The working licensed nurses are given credit and advanced placement for their prior nursing program and work history. LPN to RN mobility programs were created to encourage those students with a beginning level of nursing education and skills to continue to the advanced level of Registered Nursing (Birkhead et al., 2017).

LPN to RN programs include a system for awarding credit based on the LPN program curriculum (Murdock et al., 2000). Accepted students must then successfully complete a transition course and possible clinical experience as part of the articulation plan. Prior healthcare experience is expected to be a positive attribute that could be helpful to a nursing student in a registered nurse program; successful students then transition into the second year of the regular nursing program with those students that had completed the first year.

Nursing students often become disappointed with the nursing occupation during the clinical placement aspect of their program. Students who had prior experience as LPN or LVN did not have the same response to a negative clinical experience (Eick et al., 2012). A negative experience in the clinical portion of the program does not necessarily cause this group of students to form an opinion that nursing is not the appropriate career choice. In general, students decide on nursing as a career to care for people and deliver excellent nursing care; when that expectation is not met during the clinical portion of the program, their dream turns to disappointment, and they consider withdrawal from the program. Students with prior exposure in nursing generally do not leave the program due to a less than positive experience in clinical sites (Eick et al., 2012).

Many states have realized that LPN to RN programs could lead to a large pool of applicants that would complete a nursing program in a shorter period of time, and thus be able to enter the workforce quicker (Miller & Leadingham, 2010). The LPN pool may include greater diversity thus increasing diversity in the RN workforce (Birkhead et al., 2017). Relatively little research confirms that using LPN experience and licensure as a success indicator for nursing students was accurate.

### **GPA and HESI-A2 in Admission to Nursing Programs**

The high demand for nurses has caused increased pressure on nursing programs to graduate more students in a timely manner. As most programs have more students apply than seats available, those accepted students that stop out during the program cause large consequences for the program's reputation and accreditation (Hinderer, 2014).

Nursing programs attempt to assess student readiness for the rigor of nursing programs a standardized nursing aptitude test as an admission criterion. Several standardized assessment

tests are used by nursing programs. A common test is the Health Education Systems, Inc. Admissions Assessment (HESI A2), often used by nursing programs to assess specific variables of the students' academic preparation (Mometrix Test Preparation, 2018). While the HESI A2 is a standardized test, nine main categories can be included, and each nursing program has the flexibility to choose the categories included on their student's test. The categories are listed below:

- Reading Comprehension
- Vocabulary and General Knowledge
- Grammar
- Basic Math Skills
- Biology
- Chemistry
- Anatomy and Physiology
- Learning Style
- Personality Profile (para. 16)

While no specific score is indicated as passing or failing on the HESI A2 test, each nursing program chooses its own standard or cut score for ranking and admission into the program. HESI A2 scores were significantly positively correlated with 80% of first year course grades and with approximately 50% of nursing course grades overall in the program (Murray, 2008). The Mometrix Test Preparation guidelines suggested general scoring guidelines for the HESI A2 are the following:

- A score in the range of 75% to 79% is considered to be in the bottom range of acceptable, but an applicant whose score falls in this range will probably need quite a bit of help to succeed in nursing school.
- Scores from 80% to 89% indicate that the applicant should be able to graduate from nursing school with only minimal academic assistance.
- A score of 90% or higher is a sign that the test taker is very likely to do well in nursing school without any academic assistance (para. 20).

These standardized tests can be customized, but nursing programs typically examine students in the basic areas of math, science, reading, and English. Some institutions choose to evaluate the student's knowledge of Anatomy and Physiology, vocabulary, and reading comprehension as predictors of success using the HESI A2 standardized pre-entrance testing (Underwood, 2013). Murray et al. (2008) indicated that the HESI Admission Assessment was a valid predictor of students' academic ability and ultimately success in a nursing programs; specifically, the study highlighted that in the A.A.S. nursing program, HESI A2 scores were significantly positively correlated with success.

Nursing programs evaluate students on the pre-entrance criteria of cumulative grade point average (GPA) on courses required before admission. Grade point average is a method of converting the grades into a numerical score (Lindsay, 2018) The importance of nursing program outcomes, cause nursing programs to create pre-entrance criteria in which cumulative GPA is a major component (Jones-Schenk, 2014). GPA provides the admission committee with a comprehensive look at a student's strengths, weaknesses, and ability to challenge themselves (Lindsay, 2018). Another piece of useful information is high school GPA as there is a relationship to the student's cognitive competence (Belfield & Crosta, 2012). The results of some

studies validate that students who are intrinsically motivated for higher grades, and therefore, earn better GPA's have a greater likelihood of remaining in college (Guiffrida et al., 2013). Although placement tests gather subject specific knowledge, high school transcripts may give a wider range of attribute information about the student (Belfield & Crosta, 2012).

Literature (e.g. Abele et al., 2013) supports scholastic aptitude, such as the student's pre-nursing grade point average, was indicative of not only success in the nursing program, but also success in the NCLEX-RN standardized test taken at the end of the program. Students with strong resilience, who meet tasks willingly, and exert commitment are more likely to be successful in nursing courses (Jeffreys, 2015). Additionally, reviewing the student's high school transcript would show effort as indicated by the total number of courses taken and individual course grades and may prove to be useful information (Belfield & Crosta, 2012).

Previous research by Hinderer et al. (2014) exposed that higher HESI A2 scores did not significantly predict timely progression to completion of a nursing program; however, it did correlate higher pre-admission GPA's with time progression and subsequent success. In other research, Murray et al. (2008) did not find a correlation between the HESI A2 assessment scores and program completion; however, their research showed a correlation between the HESI A2 and GPA on pre-requisite courses. As a whole, previous research has mixed or weak correlation on standardized pre-entrance tests, nursing course GPA, and progression to completion of nursing students (Hinderer, 2014). It is important to remember that GPA can be affected by grade inflation and differences in grading systems; however, the HESI A2 provides an objective measure that can be used in the selection process for nursing school admissions (Murray et al., 2008).

## **Traditional and Non-Traditional Nursing Students**

Non-traditional students are defined as those over the age of 24 years who may have family obligations and or full or part time employment (National Center for Education Statistics, 2019). Undergraduate non-traditional nursing students must learn to structure their already packed life around college while traditional nursing students manage their lives around their studies (Priode, 2019). While traditional students can direct most of their energies toward their studies, nontraditional students frequently have family and work responsibilities that compete for time, financial resources and personal energy (Choy, 2012).

Non-traditional students often must shift their thinking and their priorities. Learning to balance work, school, and life is the most challenging yet rewarding aspect for the non-traditional group of nursing students (Dante et al., 2016). Other researchers (e.g. Dante, 2016, Fifer, 2019, Priode et al., 2016) have attempted to discover effective strategies to support non-traditional nursing students to prevent failure and withdrawal from the program, but no single effort was noted to be effective.

Traditional age nursing students preferred to study individually rather than with peer groups, however since the nursing profession is team based, approaching these younger students to advocate for peer group study could be beneficial and encourage remaining in the program (Dante et al., 2016). Without nursing faculty who will model caring behaviors to traditional age students, they may have difficulty being successful in a nursing program (Fifer, 2019). Students will follow the model of caring and support that is exhibited by nursing faculty and this type of instructor-student relationship may influence traditional age students to remain in the program to completion.

Research indicates that traditional and non-traditional students have different thoughts on their ideal instructor; traditional age students describe their ultimate instructor would be both funny and enthusiastic, while non-traditional students prefer an instructor that is organized and flexible. Nursing is a caring profession and aspects of that characteristic should be used by nursing program faculty to foster student success (Fifer, 2019).

### **Pell Eligibility of Nursing Students**

Community colleges serve roughly half of all U.S. undergraduate students, many of which are low-income and receive publicly funded grants (Marx & Turner, 2019); these Pell Grant eligible students are considered by many colleges as an at risk category. A Pell Grant is a form of federal financial aid that is based on the student's financial need and does not have to be repaid (Kerr, 2019). It is funded through the Department of Education to help those students of low income families afford the cost of a college education; the federal government provides over \$30 Billion in Pell Grant aid to nearly 8 million students from lower income families each year (Kelchen, 2017). Students with family income below \$30,000 typically receive the maximum award while only 5% of students with family income above \$70,000 receive any funds; it is important to note that if the award exceeds the cost of college tuition, a student can use the additional funds in any way they need (Park & Scott-Clayton, 2018).

In respect to the large investment of government funds, many studies seek to determine whether the investment is paying off, and low-income students are successfully graduating from college on time. For example, Vollman (2015) indicated government funded investment may be misplaced on students who do not receive any additional resources other than funding; the study further highlights that the graduation rate of Pell Grant recipients is 51% as compared to non-Pell recipients who had a graduation rate of 65%.

There are however, strong economic arguments for increasing college attendance to graduation for adult students and those of color as well as lower socioeconomic students which may only be realized by government funded aid (Swanson, 2019). Students who receive Pell Grant funds are able to decrease the need to work while attending college and allows those students to concentrate more fully on their schoolwork and increases the potential for completion (Park & Scott-Clayton, 2018).

### **ACT in College Admission**

Student success in college is often predicted by using standardized test scores such as high school grade point average (GPA), American College Testing Program (ACT) and Scholastic Aptitude Test (SAT); GPA and ACT scores are noted as the strongest predictors (Sparkman et al., 2012). Millions of high school students take the ACT each year for the sole purpose of college admission; although the scores are relevant to indicate college readiness, a documented under prediction of success for female students occurs (Keiser et al., 2016). Recent studies (e.g. Sparkman et al., 2012) theorized that college success as defined by retention and graduation may have multiple variables that contribute more reliably than test scores. Also, Kaiser et al. (2016) reported that although ACT scores were similar for males and females, females scored higher college GPAs than their male counterparts; the study gave a possible explanation that females are more conscientious, and that makes them work harder to achieve success. The outcome of the study verified that academic success can be attributed to cognitive skills and non-cognitive attributes, such as conscientiousness.

ACT scores are reported as a composite score as well as individual test scores from each of the four sections: English, math, reading and science. The ACT test scores provide knowledge into what the student has learned and to some degree to which they are ready to learn in the



college environment (ACT, 2019). As a measure of college and career readiness, the ACT organization has developed the following explanation for students and parents regarding how the ACT score is used for college benchmarking, and for college and career readiness:

The Benchmarks are scores on the ACT subject-area tests that represent the level of achievement required for students to have a 50% chance of obtaining a B or higher or about a 75% chance of obtaining a C or higher in corresponding credit-bearing first-year college courses. These college courses include English composition, college algebra, introductory social science courses, and biology. Based on a sample of 214 institutions and more than 230,000 students from across the United States, the Benchmarks are median course placement values for these institutions and as such represent a typical set of expectations. (ACT, 2019, Understanding Scores section, para 9)

The Benchmark scores are explained to students taking the ACT as they represent a typical set of expectations for students and parents. Students typically take the ACT in their junior and/or senior year; students who do not feel they made a score representative of their abilities are encouraged to retake the test (ACT, 2019). Standardized tests such as ACT and SAT are objective measurements that add value to a college admission process (Robinson, 2018). High school GPA and ACT when considered together can provide a strong predictor of college performance. Recent research (e.g. Sparkman et al., 2012) posited that emotional intelligence although difficult to measure, is more relevant to the student's ability to handle stress, control emotions, and get along with other people, which are the characteristics a student needs to navigate the transition to college and be successful. Currently, there is an easing of ACT requirements for incoming college students, due to the academic and personal disruption

of COVID-19; there is no data at this time as to the consequences of this adjustment (Vigdor & Diaz, 2020).

### **College Student Persistence to Graduation**

Student success is a topic of many studies, due to changing demographics of students, rising costs, and greater accountability for the college to not only enroll, but to track to timely completion those students (Millichap & Dobbin, 2017). Although more students than ever are attending community colleges, less than half who attend do not attain a certificate or degree (Rutschow et al., 2011). Multiple success efforts are being undertaken and many colleges are rethinking their educational models to streamline the process for their students (Millichap & Dobbin, 2017). Efforts to decrease barriers to student graduation in a timely manner may require resources such as internet infrastructure, change management programs, and more importantly additional staff dedicated to the task (Millichap & Dobbin, 2017). Success efforts to eliminate barriers begin by collecting and analyzing information on persistence, then institute college wide reform strategies designed to assist at risk students (Rutschow et al., 2011). The growing national focus on accountability for colleges has them reviewing student persistence, specific course completion, maintaining high GPA and other factors that may lead to student graduation (Rutschow et al., 2011). McKendry et al. (2013) contend that many of the studies undertaken to ascertain factors contributing to student overall retention to completion in colleges, could also be helpful when evaluating support requirements for nursing program students. Exploration of factors on student readmission after academic dismissal from college could be useful for nursing program admissions committees and policies (Harding et al., 2017). Increasing the persistence to graduation rates of nursing program students proportionally increases nurses for quality patient care (Long, 2014). Understanding

the problem is not enough. Higher education must create an infrastructure whereby change can occur to effect increased rates of completion of its students (Rutschow et al., 2011).

Faculty use of an early alert system within the college to reach out to students who show early indicators of unsuccessfulness have shown great promise toward retention (Millichap & Dobbin, 2017). Use of technology which outlines student progress toward degree completion has been shown to be effective to allow students to effectively take appropriate courses (Millichap & Dobbin, 2017). Additionally, the college can collect and analyze student performance data in order to use that knowledge to develop programs to increase students' academic success. (Rutschow et al., 2011).

### **Chapter Summary**

Research (e.g. Abele et al., 2013) stresses the importance of careful review of a student's success in pre-requisite courses for nursing programs, as an essential component of nursing program readiness. Such scrutiny may reveal students who are at risk for becoming academically unsuccessful in the nursing program. Students commonly struggle with critical thinking, time management, and study skills, in the nursing curriculum (Lewis, 2019). Studies (e.g. McDonald, 2018) indicate during the first year of a nursing program, students struggle and need additional support as they may experience feelings of uncertainty as they transition toward self-efficacy in learning. Research by Olsen (2017) identified admission criteria which could be correlated with success in a nursing program as psychological hardiness, high academic aptitude, specialty skills and prior experience, and sound socioeconomic support. Pell Grant funding provides the financial support that economically at risk students need in order to reduce the amount of work for pay hours (Park & Scott-Clayton, 2018).

Additionally, graduating from a nursing program does not guarantee the student will be successful on the NCLEX-RN exam (Carrick, 2011). Although nursing programs focus on preparing the students to take and pass the exam, there are far reaching ramifications if the student is not successful. The serious consequence is the nursing shortage in the United States. Nursing educators are acutely aware of the need to accept students into the nursing program that are predicted to perform well and be successful (Lea, 2006). The ability to identify students at risk for being unsuccessful would be encouraging for the program that has limited seat availability.

Due to the nursing shortage in the healthcare settings, nursing programs are being asked to produce more nursing graduates (Lea, 2006). It has become a matter of great importance for nursing programs to determine retention factors of students in nursing programs (Seago, 2008). Students may enter the nursing program academically unprepared for the rigor of a nursing program, and attrition rates of first semester students support this theory (Harding et al., 2017). Nursing program faculty seek to understand factors that indicate impending unsuccessfulness in nursing students (Lewis, 2019). Most nursing programs are limited by accreditation standards for the number of students that can be accepted into the program. Therefore, to produce more graduates, nursing programs may need to determine which pre-entrance factors could indicate success of the students. The use of the high school transcript may be found to offer detailed information of a student's readiness for college level work and their effort for academic work (Belfield & Crosta, 2012)

Program attrition, in addition to less graduating nurses, also reduces tuition revenue for the program, and ineffectively uses financial aid resources or increases the cost to the student and family for college (Harding et al., 2017). By 2025, the nursing shortage is predicted to be more

than twice as large as in the 1960s when Medicare and Medicaid changes occurred (Grant, 2016). Retaining more students to graduation, thus sending more nurses into the workforce is one way that nursing programs can affect an increase in the number of nurses in the workforce (Griswold, 2014).

### **Chapter 3. Research Methods**

The methods of data collection pertaining to success indicators of students in an A.A.S. Degree Nursing Program in a community college in East Tennessee are discussed in this chapter. Description of the research design, population used, data collected, and research methods are presented.

Nursing programs generally experience a significant student attrition rate between acceptance into the program and successful completion of the program. The subject of this study is to research relationships between pre-entrance factors and the success of students in an Associate of Applied Science (A.A.S.) degree nursing program at a community college in East Tennessee. Researchers indicate students entering college may not be academically prepared for the rigor of college level courses. This study attempts to explore characteristics that could possibility identify persistence to graduation of accepted nursing students. Increasing the number of new graduate nurses produced is becoming a priority in nursing education programs to address the growing nursing shortage (Long, 2014). This non-experimental secondary analysis examines variables to assess their correlation, if any, to successful completion of the A.A.S. degree nursing program. A quantitative research design is appropriate while investigating the relationship between student variables through statistical analysis. The purpose of the study was to analyze existing data in an effort to provide an opportunity to refine program admissions guidelines and support those students identified as needing extra resources. Some research validates that the use of entrance examinations such as HESI-A2 and could assist nursing programs in making evidence based decisions with student applicants. This could help to identify those students who are academically prepared to be successful when facing the challenges and rigor of a nursing program (Murray et al., 2008).

## Research Questions and Null Hypotheses

This study was guided by the following research questions and corresponding null hypotheses:

Research Question 1: Is there a significant difference in nursing students mean HESI A2 scores between successful program completers and non-completers in an A.A.S. nursing program?

Ho1: There is no significant difference in nursing student's mean HESI A2 scores between successful program completers and non-completers in an A.A.S. nursing program.

Research Question 2: Is there significant relationship between student gender and program completion in an A.A.S. nursing program?

Ho2: There is no significant relationship between student gender and program completion in an A.A.S. nursing program.

Research Question 3: Is there a significant difference in student age between program completers and non-completers in an A.A.S. nursing program?

Ho3: There is no significant difference in student age between program completers and non-completers in an A.A.S. nursing program.

Research Question 4: Is there a significant relationship between Pell Grant eligibility and program completion in an A.A.S. nursing program?

Ho4: There is no significant relationship between Pell Grant eligibility and program completion in an A.A.S. nursing program.

Research Question 5: Is there a significant difference in high school GPAs between successful program completers and non-completers in an A.A.S. Nursing Program?

Ho5: There is no significant difference in high school GPAs between successful program completers and non-completers in an A.A.S. Nursing Program.

Research Question 6: Is there a significant difference in pre-nursing GPAs between program completers and non-completers in an A.A.S. nursing program?

Ho6: There is no significant difference in pre-nursing GPAs between program completers and non-completers in an A.A.S. nursing program.

Research Question 7: Is there a significant relationship between program completers in an A.A.S. nursing program and whether or not they had prior nursing licensure?

Ho7: There is no significant relationship between program completers in an A.A.S. nursing program and whether or not they had prior nursing licensure.

### **Population**

The population was derived from an open access, public, community college located in upper east Tennessee. It is a comprehensive community college that provides courses designed for transfer to a university as well as career programs designed for students that desire to enter the workforce. The population of this study consisted of all students accepted into the A.A.S. Nursing Program at the selected community college for academic years beginning 2013-14, 2014-15, and 2015-16. The students were identified by the official fall and spring semester rolls on the 14th day of class. Nursing students accepted into the nursing program attend four semesters over two years of nursing specific courses. The nursing program normally accepts 70 students per year in the traditional nursing track and 30 students per year in the LPN to RN Bridge Program. The data included characteristics of all accepted students from traditional nursing and the career mobility LPN to RN Bridge program students. Three academic years of data was used to ensure adequate numbers of students and to account for normal attrition. The



total population in the study was approximately 300 students. Students who withdrew after initial acceptance into the nursing program were included and counted as academically unsuccessful.

The population of the data included male and female students, age eighteen years and older. Ninety students in the population entered the nursing program through the career mobility articulation, LPN to RN Bridge Program.

### **Instrumentation**

Archival data from the Institutional Effectiveness Division at the participating community college was used. The pertinent data existed in an electronic database in the community college Banner system. The system contained the necessary information as the college archives data for institutional effectiveness and trending. The Ellucian Banner is an enterprise resource planning (ERP) and student information system that is used to record and maintain student, alumni, and financial data. Banner consists of five integrated modules that include the following: Banner Advancement, Banner Financial, Banner Financial Aid, Banner Human Resources, and Banner student. The Banner software system is a state-wide database for collection and storage of student information within colleges in the Tennessee Board of Regents (TBR) institutions of higher education.

The Health Education Systems Admissions Assessment (HESI A2) is a computerized standardized assessment test used by nursing programs to assess specific variables of a student's academic preparation for the rigor of a nursing program (Mometrix, 2018). Manieri et al. (2015) presented the HESI A2 test used as a pre-entrance test was statistically significant in predicting success in a nursing program with p value of less than .001. Data analysis in the study revealed the use of the HESI A2 scores relate better to student success than two most common pre-

entrance testing (Manieri et al., 2015). The student's score on the HESI A2 is a part of the application packet for the program admission committee to review.

### **Data Collection**

Prior to the collection of any data, permission was obtained from the Dissertation Committee and the Internal Review Boards of East Tennessee State University and the selected community college. The data in this retrospective analysis were gathered from the community college Banner System through the Institutional Effectiveness Division. Prior to its release to the researcher, the data were coded, and all personal identifiers were removed by the Institutional Effectiveness Division Data Manager. All data remained unidentifiable and confidential.

The requested data, stripped of any identifying information, were furnished by the Institutional Effectiveness Division personnel in an Excel spreadsheet. The study required disaggregation of data variables from the excel spreadsheets to correspond with the research questions. Data for the entire population of accepted nursing students in the academic years 2013-14, 2014-15 and 2015-16 were collected.

### **Data Analysis**

Data were collected and analyzed for the entire population of accepted nursing students in the academic years 2013-14, 2014-15 and 2015-16. IBM SPSS offers advanced statistical analysis and was used to analyze the data; a significance level of .05 was used for all analyses. Research Questions 1, 3, 5, and 6 called for comparing completers and non-completers on measures of HESI A2 scores, student age, high school GPAs, and pre-nursing GPAs. These research questions were analyzed by a series of independent sample t-tests. Research Questions 2, 4, and 7 were analyzed by a series of chi-squares using cross tabs to measure the relationships of program completion, student gender, Pell eligibility, and prior nursing licensure.

## **Chapter Summary**

This study was a quantitative research design, which was appropriate for investigating the relationship between student variables through statistical analysis. Participants were all students accepted into the nursing program for the academic year 2013-14, 2014-15, and 2015-16. The data chosen to review was correlated with the research questions as they related to successful completion of the nursing program. Chapter 3 identified research methodology, research design and population. Chapter 4 presents the findings of the study through charts and graphs. Interpretation of the data is also included in Chapter 4. Chapter 5 discusses the findings and any relevant conclusions for student success. Implications for future research and practice will also be presented in Chapter 5.

## **Chapter 4. Findings**

Registered Nursing is listed among the top occupations in terms of job growth through 2024, according to the Bureau of Labor Statistics (Rosseter, 2017). The total number of unfilled nursing jobs is expected to grow to 1.09 million by 2024. Nursing programs are being asked to produce as many new nurses as possible to fill the void. There is a disparaging difference between the number of nursing students who are accepted into nursing programs and those who successfully complete those programs. This study was developed to examine student success factors of those admitted into a nursing program. Nursing programs must evaluate student success factors in order to assist those students that may need additional support to succeed. Research questions were developed and used to direct the study. The HESI A2 is a standardized admissions test required for those students making application into the nursing program. The HESI A2 includes nine main categories, however a cumulative score was used in this study. Independent t-tests and chi square cross tabs were used to determine relationships between the criterion and the variables. The population of the study was all students accepted into the A.A.S. Nursing program for the academic years 2013-14, 2014-15 and 2015-16. The research questions, null hypothesis and data analysis are presented in this chapter.

### **Research Question 1**

Is there a significant difference in nursing students mean HESI A2 scores between successful program completers and non-completers in an A.A.S. nursing program?

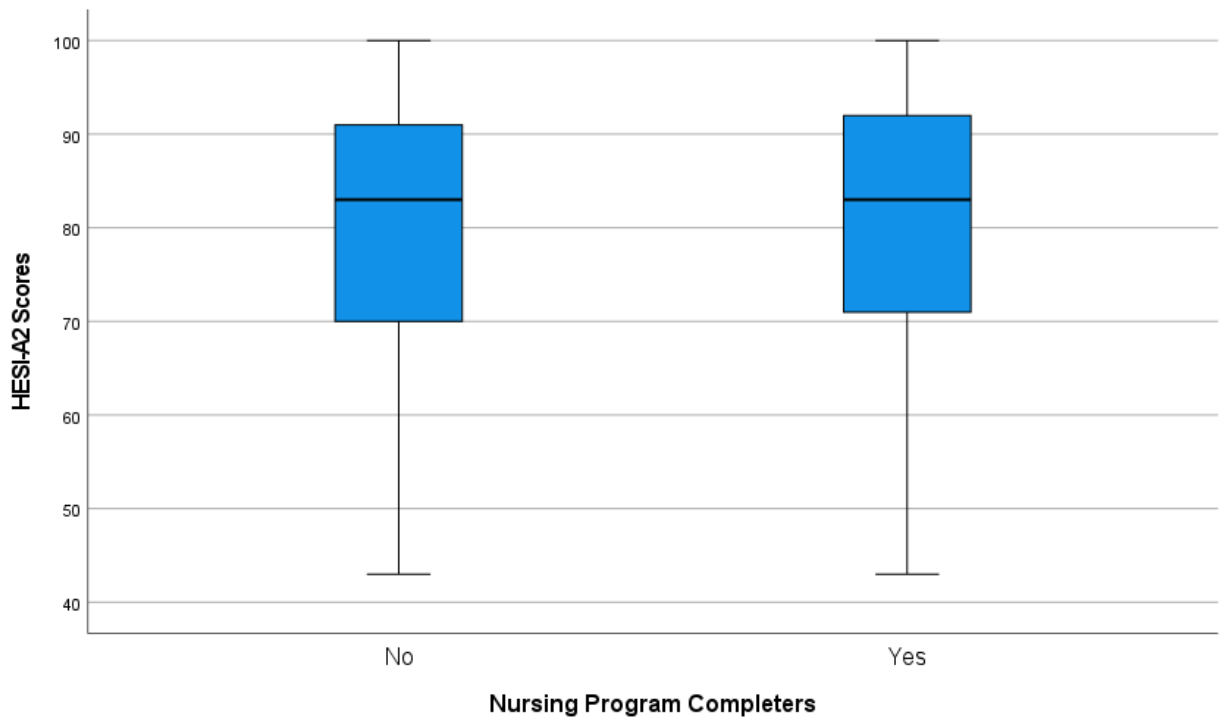
Ho1: There is no significant difference in nursing student's mean HESI A2 scores between successful program completers and non-completers in an A.A.S. nursing program.

An independent-samples t-test was conducted to evaluate whether the mean scores of HESI A2 differed between program completers and non-completers. The test was significant, t

(249) = 3.871,  $p < .001$ . Therefore, the null hypothesis was rejected. The cumulative scores for students who completed the nursing program ( $M = 83.71$ ,  $SD = 5.80$ ) are significantly higher than the students who did not complete the program ( $M = 80.54$ ,  $SD = 6.45$ ). The 95% confidence interval for the differences in means was -4.77 to -1.55. The  $\eta^2$  index was .05 which indicated a small to medium effect size. Figure 1 shows the distribution for the two groups.

**Figure 1**

*HESI A2 Scores*



## Research Question 2

Is there a significant relationship between student gender and program completion in an A.A.S. nursing program?

Ho2: There is no significant relationship between student gender and program completion in an A.A.S. nursing program.

Students were identified as male or female. The total population was 366 students with 50 male and 316 females. Of the 50 male students, 48% completed the nursing program while 52% of the students did not. Of the 316 female students, 77.5% completed the nursing program while 22.5% did not complete. Table 1 indicates the number of male and female students who completed the nursing program. A two-way contingency table was conducted to evaluate the proportion of the program completion varies based on gender. Program completion and gender were found to be significantly related, Pearson  $\chi^2(2, N = 366) = 19.328, p < .001$ , Cramer's  $V = .23$ . Therefore, the null hypothesis was rejected. In general, female students were more likely to complete the nursing program than their male counterparts were. Table 1 displays the proportion of program completion as related to gender. Figure 2 displays the numerical values of male and female students and completion and non-completion.

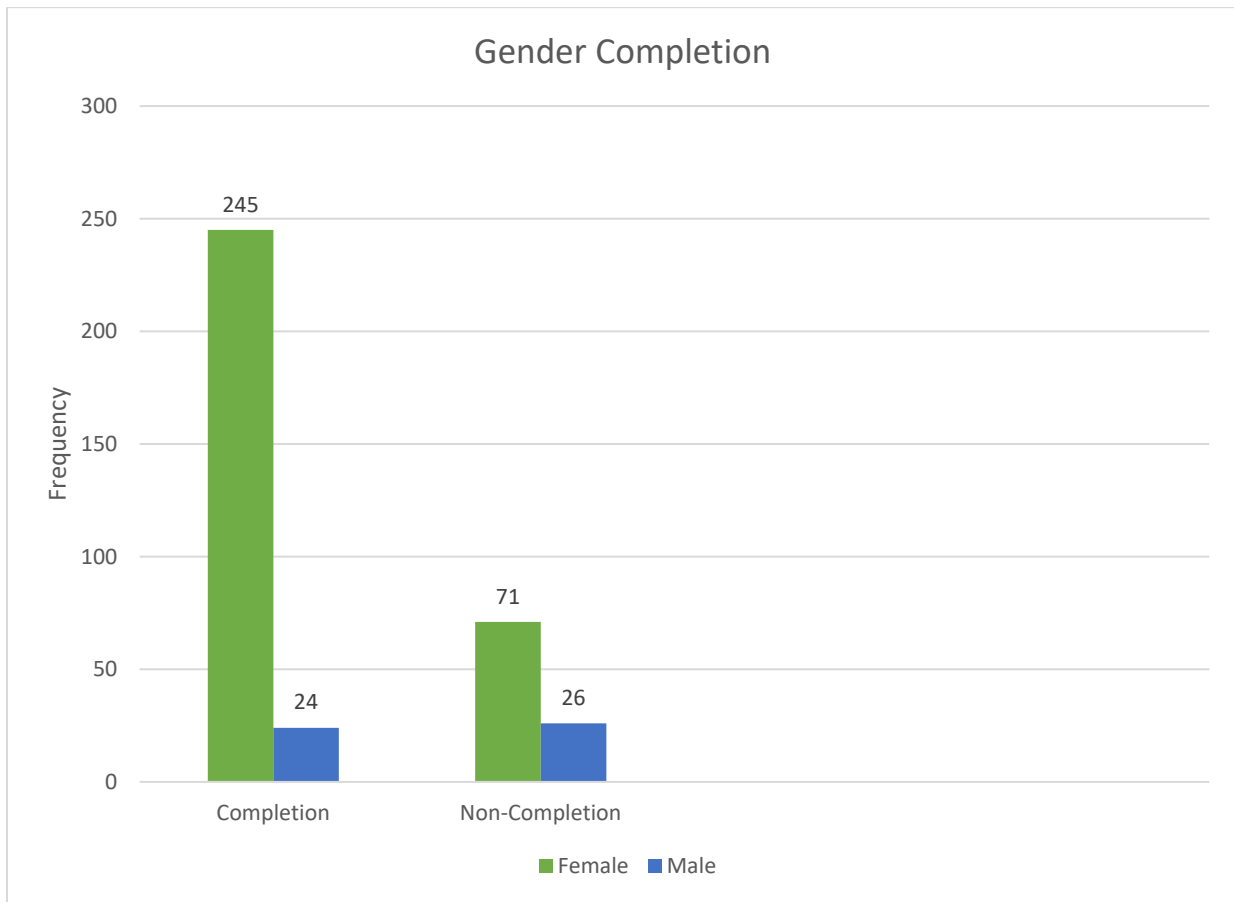
**Table 1**

*Program Completion and Student Gender*

	Completed N	Did not Complete N	Total N
Male	24	26	50
Female	245	71	316

**Figure 2**

*Gender and Completion*



**Research Question 3**

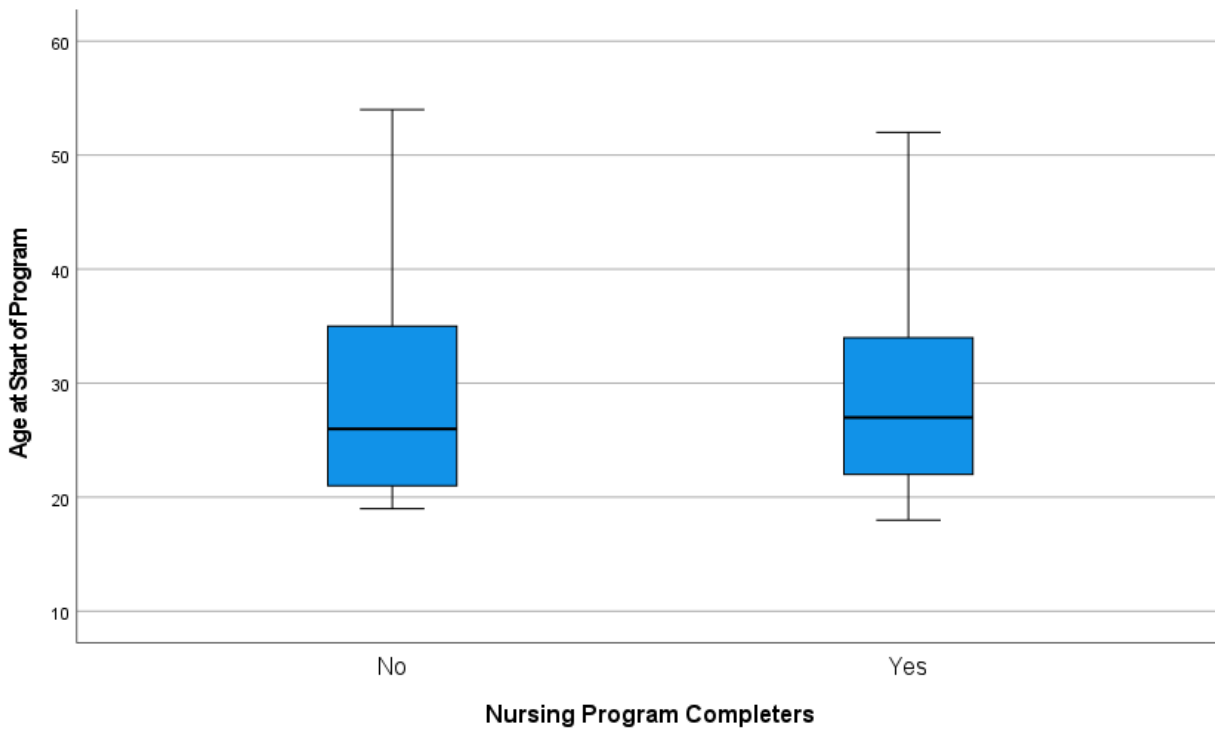
Is there a significant difference in student age between program completers and non-completers in an A.A.S. nursing program?

Ho3: There is no significant difference in student age between program completers and non-completers in an A.A.S. nursing program.

An independent-samples t-test was conducted to evaluate whether the student's age at the start of the nursing program differed between program completers and non-completers. The test was not significant,  $t(370) = .082$ ,  $p = .935$ . Therefore, the null hypothesis was retained. The

mean age for students who completed the nursing program (M=29.08, SD=8.86) was not significantly different from those who did not complete the program (M=29.00, SD=9.34). The 95% confidence interval for the difference in means was -2.13 to 1.96. The  $\eta^2$  index was  $< .01$  which indicated a small effect size. Figure 3 shows the distribution for the two groups.

**Figure 3**  
*Student Age*





#### **Research Question 4**

Is there a significant relationship between Pell Grant eligibility and program completion in an A.A.S. nursing program?

Ho4: There is no significant relationship between Pell Grant eligibility and program completion in an A.A.S. nursing program.

The total number of students for the three years academic years was 372, of which 233 were Pell eligible and 139 were not Pell eligible. (Table 2). A two-way contingency table analysis was conducted to evaluate whether there was a significant relationship between Pell eligibility and program completion in an A.A.S. nursing program. Program completion and Pell eligibility were found not to be significantly related,  $\chi^2(1, N = 372) = .177, p = .674$ , Cramer's  $V = .022$ . Therefore, the null hypothesis was accepted. In general, students who are Pell eligible are not significantly more likely to complete the nursing program than students who are not Pell eligible. Of the 233 Pell Eligible students, a total of 169 students completed the nursing program which was a 72% success rate for those students who were Pell Eligible. There were 64 Pell Eligible students that did not complete the program. Table 2 and Figure 4 displays the proportion of program completion as it relates to Pell Eligible students.

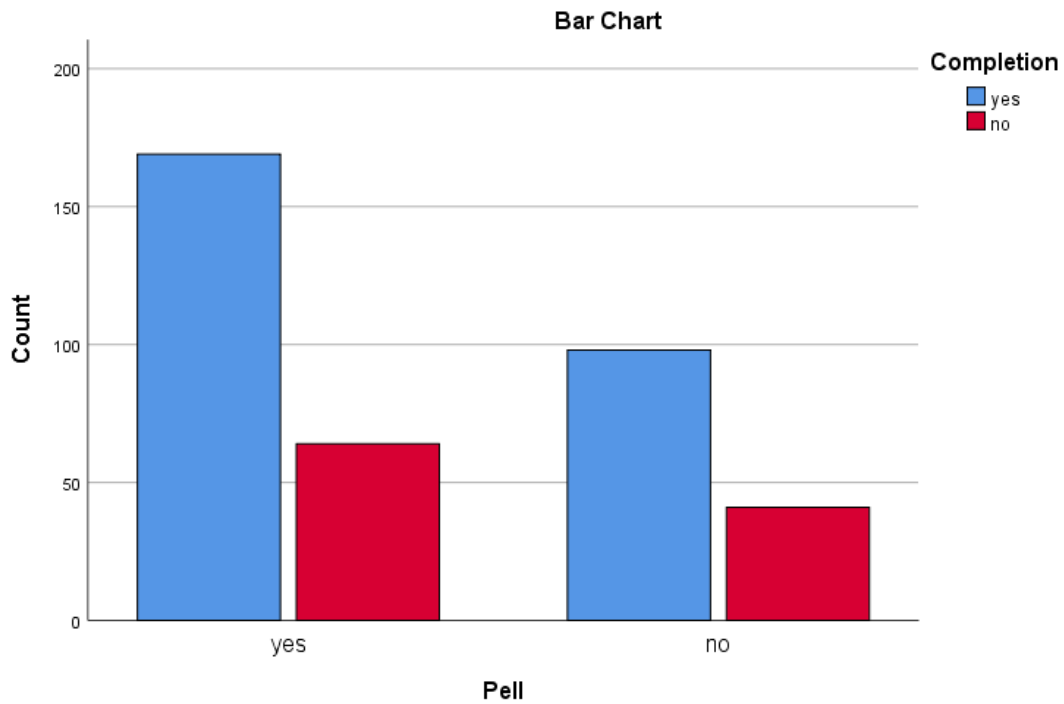
**Table 2**

*Completion and Pell Eligibility*

	Completed N	Did not Complete N	Total N
Pell Eligible	169	64	233
Not Pell Eligible	98	41	139

**Figure 4**

*Pell Eligible Completion*



### **Research Question 5**

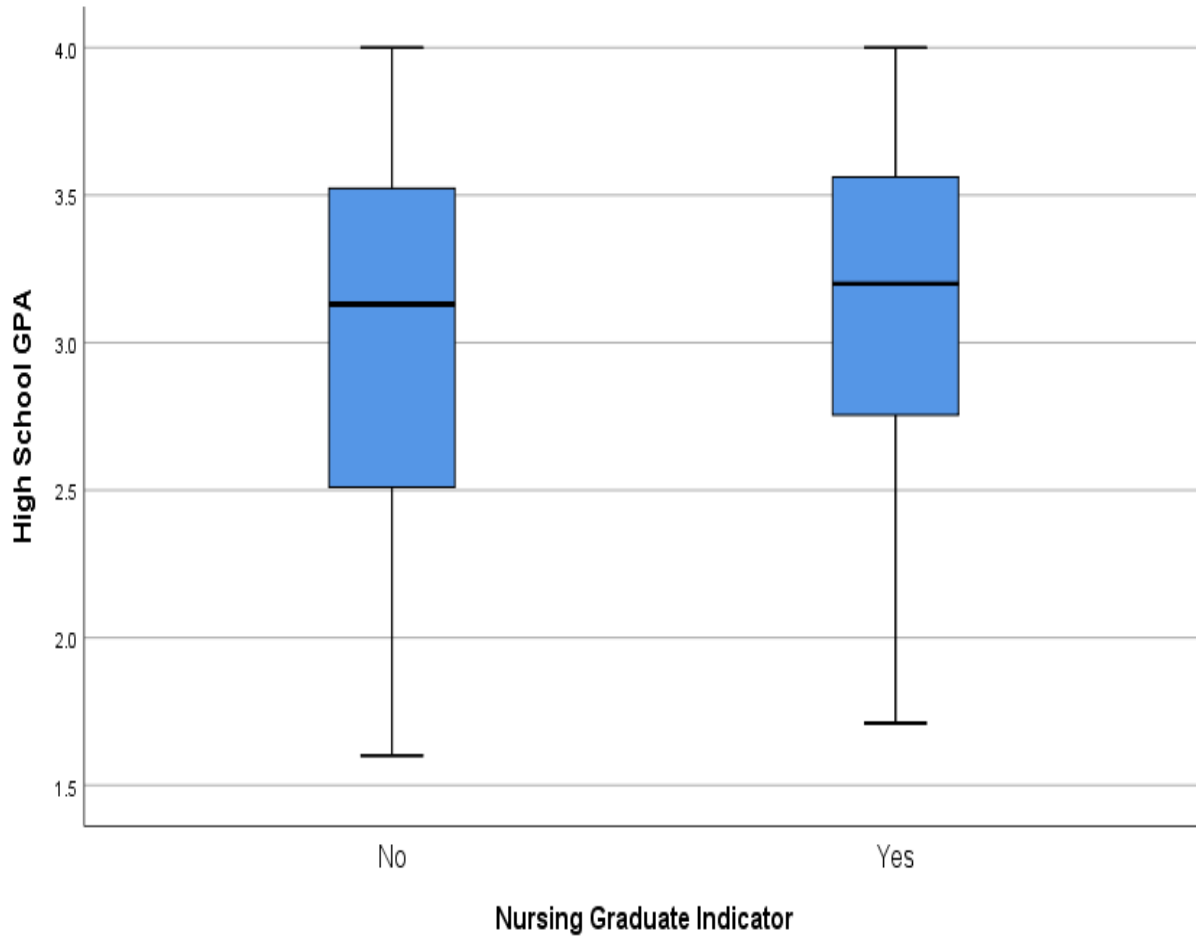
Is there a significant difference in high school GPAs between successful program completers and non-completers in an A.A.S. Nursing Program?

Ho5: There is no significant difference in high school GPAs between successful program completers and non-completers in an A.A.S. Nursing Program.

An independent-samples t-test was conducted to evaluate whether the nursing student's high school GPA differed between program completers and non-completers. The test was not significant,  $t(305) = 1.577$ ,  $p = .116$ . Therefore, the null hypothesis was retained. The cumulative high school GPAs of students who completed the nursing program ( $M = 3.12$ ,  $SD = .58$ ) are somewhat, but not significantly, higher than those that did not complete ( $M = 3.00$ ,  $SD = .65$ ). The 95% confidence interval for the differences in means was  $-.274$  to  $.030$ . The  $\eta^2$  index was  $.008$ , which indicated a small effect size. Figure 5 shows the distribution for the two groups.

**Figure 5**

*High School GPA*



## Research Question 6

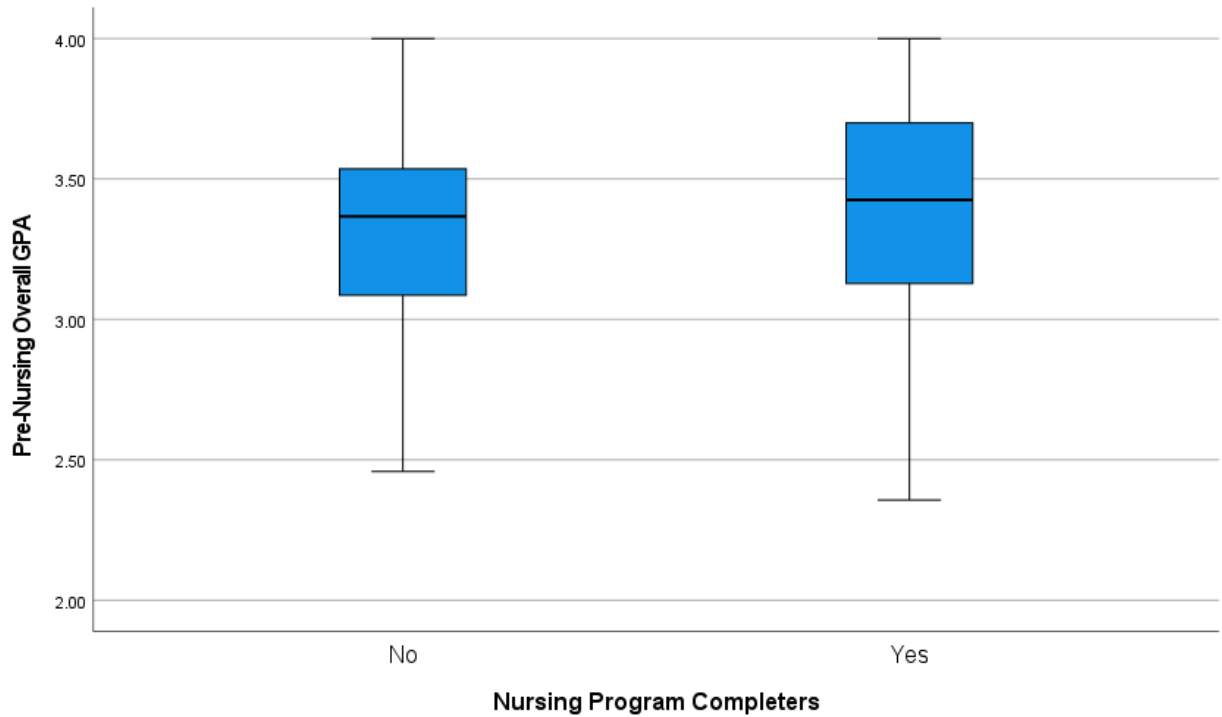
Is there a significant difference in pre-nursing GPAs between program completers and non-completers in an A.A.S. nursing program?

Ho6: There is no significant difference in pre-nursing GPAs between program completers and non-completers in an A.A.S. nursing program.

An independent-samples t test was conducted to evaluate whether the mean pre-nursing GPAs differed between program completers and non-completers. The test results were close but not significant,  $t(348) = 1.766$ ,  $p = .078$ . Therefore, the null hypothesis was retained. Cumulative mean scores for students completing the nursing program ( $M = 3.41$ ,  $SD = .390$ ) were somewhat, but not significantly, higher than students who did not complete the program ( $M = 3.33$ ,  $SD = .335$ ). The 95% confidence intervals for the differences in means was  $-.1610$  to  $.0035$ . The  $\eta^2$  index was  $.008$ , which indicated a small effect size. Figure 6 shows the distribution for the two groups.

**Figure 6**

*Pre-Nursing GPA*



**Research Question 7**

Is there a significant relationship between program completers in an A.A.S. nursing program and whether or not they had prior nursing licensure?

Ho7: There is no significant relationship between program completers in an A.A.S. nursing program and whether or not they had prior nursing licensure.

The nursing program contains an LPN to RN bridge program which began in 2015. The bridge program consists of students who had previous licensure as an LPN prior to making application. The 372 students' data were analyzed with 63 of those students holding prior licensure as an LPN. Of those holding prior license, which was a total of 63 students, 57 were female and 6 were male. A two-way contingency table analysis was conducted to evaluate

whether there was a significant relationship between program completers and prior licensure.

Prior licensure and program completion were not found to be significantly related, Pearson  $\chi^2$  (2, N = 372) = 4.741, p = .093, Cramer's V = .113. Therefore, the null hypothesis was retained.

There was not a significant relationship between prior licensure and program completion. Female students holding prior licensure completed the program at a rate of 82.5% which was slightly, but not significantly, higher than male students holding prior licensure who completed at a rate of 50%. Figure 7 displays the proportion of program completion as related to prior licensure.

Table 3 displays the numerical depiction of male and female completers and non-completers.

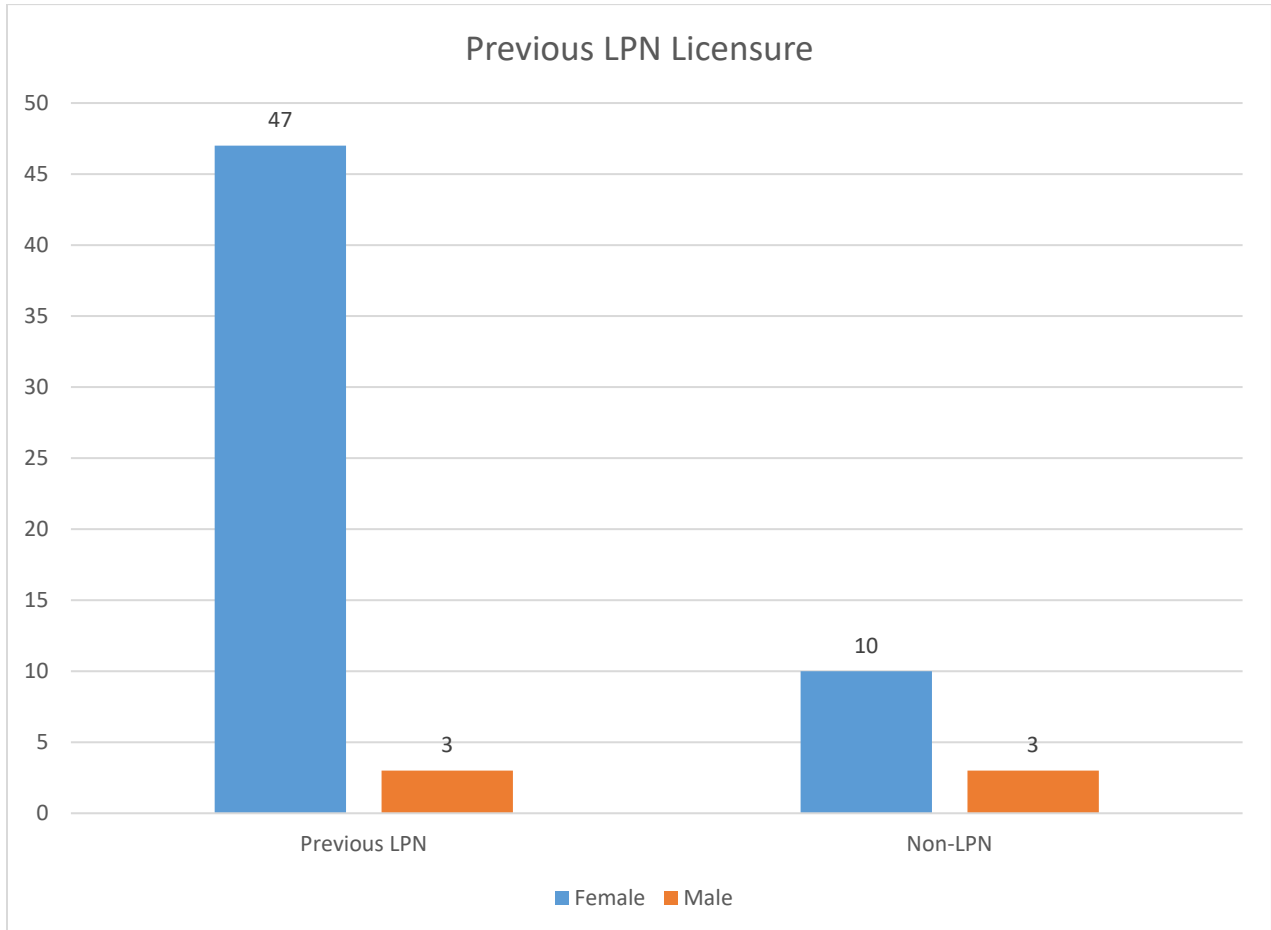
**Table 3**

*Program Completion and Prior Licensure*

	Completed		Did not Complete		Total
	Female	Male	Female	Male	
Prior Licensure	N 47	N 3	N 10	N 3	N 63

**Figure 7**

*Previous LPN Licensure*



### **Chapter Summary**

Chapter 4 presents the research questions, null hypotheses, and data analysis, along with the findings of the study through interpretation of the data. A series of independent samples t-tests and chi-square tests (two-way contingency tables) were used to measure differences or relationships between the criterion and predictor variables. Data were shown using figures and tables. Chapter 5 discusses the findings and any relevant conclusions for student success.



Suggestions for future studies on the topic that may fill in gaps in the literature are also presented in Chapter 5.

## **Chapter 5. Summary, Conclusions, and Recommendations**

### **Summary**

The purpose of this study was to evaluate the relationship of pre-entrance factors and the success of students in an Associate of Applied Science (A.A.S.) degree nursing program at a community college in east Tennessee. The population of the study consisted of all students accepted into the Nursing Program for the academic years 2013-14, 2014-15 and 2015-16. The demographic pre-entrance factors of student age and gender were evaluated. Academic factors of high school GPA, pre-Nursing GPA, and HESI A2 pre-entrance scores, were examined to assess student readiness for a demanding college program. The socioeconomic factor of Pell eligibility, along with the variable of holding prior healthcare licensure as an LPN, were also examined.

Knowledge of factors that could indicate success in the demanding nursing program and information gained from studying these variables may be used to develop strategies for interventions to assist future nursing students. Nursing Program admission criteria aims to ensure students selected will successfully complete the program (Griswold, 2014). Nursing Programs must evaluate student success factors in order to assist those students that may need additional support to succeed. Increasing the persistence to graduation rates of nursing program students proportionally increases nurse graduates to fill a widening void of unfilled nursing positions in healthcare.

The difference in nursing students mean HESI A2 scores between successful program completers and non-completers in an A.A.S. nursing program were significant. The mean HESI A2 scores were significantly higher in those students who completed the program and those students that did not. This is an encouraging finding for nursing programs that use a minimum

HESI A2 score as pre-entrance guideline to help predict students with a greater chance of successful completion.

The study revealed there was a significant relationship between program completion and gender. In general, female students were more likely to complete the nursing program than their male counterparts. It is important to note that of the total population of nursing students, only 14% were male.

The study evaluated the students age for significance with program completion. The test was not significant in that student age was not significantly related to successful completion of the nursing program. Whether students were traditional or non-traditional, age was not found to be a significant factor contributing to student success.

Analysis was conducted to evaluate whether there was a significant relationship between students who were Pell Eligible and program completion in an A.A.S. nursing program. Findings indicated that students who were Pell eligible were not significantly more likely to complete the nursing program.

The study attempted to address the question of whether a student's aptitude in high school could be an indication of their success in a college nursing program through the use of high school GPA. The data found the high school GPA of students who completed the nursing program were not significantly higher than those who did not complete. Although high school GPA is an indication of a student's high school academic aptitude, it cannot be considered as a predictor of success for an academically demanding college level program such as a nursing program.

A goal of this study was to investigate whether pre-nursing GPA in successful students

would be significantly different from those students that did not successfully complete the nursing program, the test results were not significant. Cumulative mean scores for students completing the nursing program were slightly, but not significantly, higher than the scores of students who did not complete the program. Although pre-nursing GPA is an indication of a student's propensity to be successful in college level courses, it should not be considered as a predictor of success for an academically demanding college nursing program.

The study examined the relationship between successful program completers with prior licensure as an LPN and those that completed the program that did not have prior licensure. Prior licensure as an LPN would seemingly indicate those students had healthcare knowledge and experience prior to entering the nursing program. However, the data revealed prior licensure and program completion were not found to be significantly related.

While only 17% of the total population of accepted students held prior licensure, female students holding prior licensure completed the program at a rate of 82.5% while male students holding prior licensure completed at a rate of 50%. This was found to be consistent with other data in this study concerning gender and successful completion of a nursing program.

### **Conclusions**

The purpose of this study was to evaluate the relationship of pre-entrance factors and the success of students in an Associate of Applied Science (A.A.S.) degree nursing program at a community college in east Tennessee. The study aimed to analyze existing data in an effort to provide an opportunity to refine program admissions guidelines and support those students identified as needing extra resources. Seven research questions were used to guide the study. Two variables that were studied were found to have a significant relationship with successful

completion of a nursing program. Five variables studied were not found to have a significant relationship with successful completion.

Students who successfully completed the nursing program were shown to have significantly higher HESI A2 scores than those who did not complete. The study revealed student gender and student program completion were significantly related, as female students were more likely to complete the nursing program than their male counterparts. The study examined Pell Eligibility and nursing program completion and revealed Pell eligible students were not significantly more likely to complete the nursing program than non-Pell eligible nursing students. This college should continue to offer extra tutoring as an academic support to assist students especially at risk groups such as Pell eligible students.

This study revealed that there were significantly higher HESI A2 scores of those students who successfully completed, than the scores of those students that did not successfully complete the nursing program. Although as a whole, previous research has mixed or weak correlation on standardized pre-entrance tests, nursing course GPA, and progression to completion of nursing students (Hinderer, 2015). Previous research by Murray et al. (2018) did not show a significant relationship between higher HESI A2 scores and successful completion of a nursing program. Hinderer et al. (2014) posits that further studies are needed to explore the utility and predictive ability of standardized examinations such as the HESI A2 Examination and the contribution of such examinations to evidence-based admission decision making. This study confirms previous research that support use of the HESI-A2 as a nursing program pre-entrance criterion to predict a candidate's likelihood of success.

This nursing program should continue to use the HESI-A2 as a pre-entrance requirement.

Researchers (e.g. Guiffrida et al., 2013) suggested female students graduate from college at significantly higher rates than their male counterparts. This study revealed findings of gender and successful nursing program that were consistent with the study noted for college completion. In general, female students had significantly higher completion rates in the nursing program than their male counterparts. However, it is worthy to note that the number of male and female students accepted into the nursing program were not equal, with only fourteen percent being male. Findings in this study were consistent with the findings indicated by the 2015-2016 Biennial Survey by the National League for Nursing, which indicated that men represented only 14% of the total enrollment in all levels of nursing programs.

Pell Grant eligible students are considered by many colleges as an at risk category for completion (Marx & Turner, 2019). A 2015 study by Vollman further highlights that the graduation rates of Pell Grant recipients is 51% as compared to non-Pell recipients which had a graduation rate of 65%. The present study revealed Pell eligible students were not significantly more likely to complete the nursing program than non-Pell eligible nursing students. Nursing program students were not more likely to be successful in this community college program than those who were not receiving Pell Grant funding. Vollman also indicated that the government funded investment in Pell Grants may be misplaced on students who do not receive any additional resources other than funding. In general, community colleges offer many additional resources for students aimed at helping them be successful including identification of at-risk status. Carrick (2011) provides the first element of a strong student support system is early identification of at-risk students; and further identifies that student mentoring, peer tutoring and student support study groups are all acceptable means of supporting those students. This nursing program offers student mentoring through advisor sessions with nursing faculty and offers a peer

tutoring space in the facility, thus providing extra support for nursing students to include at-risk students.

Several variables were not found to correlate with successful completion of the nursing program. Student age was not found to be a significant indicator of completion. The nursing program population contained students who are considered traditional, 18-24 years of age and non-traditional over 24 years of age, yet neither group was significantly related to success. However, some studies do not support this finding (e.g. Priode, 2019). Priode reported that undergraduate non-traditional nursing may struggle more as that group of students attempt to structure their already packed life around college while traditional nursing students manage their lives around their studies.

Student success in college is often predicted by using standardized test scores such as high school grade point average (Sparkman et al., 2012). High school GPA and pre-nursing GPA are variables that are used in the acceptance process for the Nursing Program. This study revealed there was not a significant relationship with a higher GPA based on high school academics or pre-nursing courses taken at college, and the success of the student in the nursing program. In contrast, in one study, high GPA and ACT scores are noted as the strongest predictors of success (Sparkman et al., 2012).

The population of this study included students who were admitted through the LPN to RN Bridge program. LPN to RN mobility programs were created to encourage those students with a beginning level of nursing education and skills to continue to the advanced level of Registered Nursing (Birkhead et al., 2017). The working licensed practical nurses are given credit and advanced placement for completing a prior nursing program and work history. This study revealed prior licensure was not significantly related to successful completion. This was a

surprising finding, as prior licensure as an LPN, would generally be associated with increased prior healthcare knowledge and lead to successful program completion.

### **Recommendations for Practice**

The following are recommendations gathered from the results of this study. Nursing program admission committees should consider these recommendations to assist student success in a nursing program.

- Continue to use the HESI A2 test as one aspect in the admissions process for the nursing program.
- Put additional resources such as peer tutoring in place for students accepted into the nursing program that may struggle to successfully complete and pay special attention to courses in which students appear to struggle academically.
- Make additional non-academic resources available such as scholarships and childcare vouchers for students to encourage academic success in the program, which will have a positive impact on the nursing shortage by adding graduates to the healthcare field.

### **Recommendations for Future Research**

Future studies will be strengthened by examining these recommendations as derived from this study.

- Nursing programs should create exit surveys to administer to those students that do not successfully complete the nursing program at the time they stop out. Any non-academic data gathered support and add to the academic findings. Data obtained may reveal non-academic variables that influence student persistence to graduation. Data such as marital status, number of societal responsibilities such as children or elderly parents to care for may be important factors



to consider and steer the need to supply additional resources. The variable of considering those students that work in addition to attending school may also be an important factor to consider when gathering data.

- Future studies should include students enrolled in nursing programs from multiple community colleges. Gathering data from multiple community colleges would ultimately include differing socio-economic areas. College readiness for a demanding program such as nursing may vary by area of residence.
- Future studies need to include data of what point in the program the student stopped out. This type of data would serve to notify the nursing program what extra resources may need to be made available for specific semesters or courses. Data revealing a specific course at the time the student stopped out, may indicate the need for additional tutoring or supportive measures.
- A future study should include identification of additional variables related to prior licensure as an LPN and student success in an A.A.S. nursing program. Researchers should explore what specific courses this subpopulation of students struggle to complete such as whether students who had prior knowledge stop out due to academic courses or clinical experiences.

This study has confirmed that the HESI-A2 test is an indicator of the student's ability to be successful in a rigorous nursing program. The study also relayed that male nursing students do not persist in college nor in the nursing program at rates similar to female students. Use of a male nursing faculty member may be valuable as a role model for male nursing students. Supporting nursing students with academic and non-academic issues may increase program retention rates. This study aimed to assist a nursing program admissions committee to identify significant pre-entrance factors to admit the best possible candidates to decrease the number of students that fail

to successfully complete the program. Increasing the number of graduating nursing students is needed to help fill the void of bedside nurses in the college service area.

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