THE PREDICTIVE RELATIONSHIP BETWEEN PRE-NURSING BOOT CAMP PARTICIPATION AND SUCCESSFUL COMPLETION OF THE FIRST SEMESTER AND RETENTION IN AN ASSOCIATE DEGREE NURSING PROGRAM

by

Misty Beth Stine

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Philosophy in Nursing: Nursing Education

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ABSTRACT

First semester students in undergraduate nursing programs are at the highest risk for attrition, so retention of these students is a priority concern. The purpose of this non-experimental correlational predictive quantitative study was to investigate whether participation in a pre-nursing student boot camp is predictive of successful completion of the first semester and retention at an Associate Degree Nursing program at a community college in the rural Southwestern United States. Data was retrospectively obtained from archival student records for all first semester nursing students accepted into the ADN program from 2018-2022. Sample size was $N = 227$. The chi-square test of independence indicated a statistically significant association between successful first semester completion and retention to the second semester after boot camp participation, $\chi^2(1, 226)$, $p < .001$. The binary logistic regression indicated statistically significant predictions between successful first semester completion and retention to the second semester of the ADN program and generational cohort $\chi^2(1) = 4.21$, $p = .040$, and race $\chi^2(1) = 6.72$, $p = .010$ (for Hispanic race) and $\chi^2(1) = 9.28$, $p = .002$ (for White race). Black/African American race, $\chi^2(1) = 0.32$, $p = .572$; gender $\chi^2(1) = 0.56$, $p = .456$; and financial aid $\chi^2(1) = 0.36$, $p = .546$, did not statistically significantly predict successful first semester completion and retention to the second semester of the ADN program after boot camp participation. Study findings are significant to nursing education research, adding to the body of knowledge, and informing the creation and implementation of new strategies that improve nursing student retention. Suggestions for future research include a comparison of previous years without boot camp to current years with boot camp and conducting a study with a qualitative design.

Keywords: nursing student retention, nursing student attrition, nursing student retention strategies, nursing student success, boot camp, pre-entrance orientation

Dedication

I would like to dedicate this work to all current and future nursing students who are committed to becoming registered nurses and to the nurse educators dedicated to facilitating and supporting these nursing students with innovative, holistic nursing student retention strategies.

Acknowledgments

I would like to acknowledge our Heavenly Father for giving me the perseverance and strength to begin, continue, and complete this doctoral process and degree. To my husband and family, thank you for your faith, patience, support, and encouragement during this process. James, I could not even begin to imagine how I would have accomplished this without your love and understanding. Thank you for believing in me. I also want to acknowledge my chair, Dr. Pape, and committee members, Dr. Polk, and Dr. Bridge: I appreciate your wisdom, guidance, kindness, and encouragement during this process. This has definitely been a rich learning experience, and I could not have accomplished it without your guidance and support.

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List of Abbreviations

American Nurses Association (ANA)

Associate Degree in Nursing (ADN)

Bachelor of Science in Nursing (BSN)

Board of Nursing (BON)

Cultural Values and Beliefs (CVB)

Enterprise Resource Planning (ERP) System

Generation X (Gen X)

Generation Y (Gen Y)

Generation Z (Gen Z)

Higher Education (HE)

Jeffrey's Nursing Universal Retention and Success (NURS) Model

Institutional Review Board (IRB)

National Council Licensure Examination for RNs (NCLEX-RN)

National Council of State Boards of Nursing (NCSBN)

Outside Surrounding Factors (OSF)

Registered Nurse (RN)

The Accreditation Commission for Education in Nursing (ACEN)

CHAPTER ONE: INTRODUCTION

Overview

The study of undergraduate prelicensure nursing student retention strategies may improve student outcomes and the nursing shortage. The purpose of this non-experimental correlational predictive quantitative study was to investigate the relationship between successful first semester completion and retention to the second semester after boot camp participation in an ADN program at a community college in the rural Southwestern region of the United States. The study discovered a statistically significant relationship between successful first semester completion and retention to the second semester and statistically significant predictive correlations to student age, categorized by generational cohort and race with successful first semester completion and retention of nursing students after boot camp participation in the sample. Chapter One provides the social, historical, and theoretical background of the problem, as well as a supporting theoretical framework for the current study. The problem statement, the purpose statement, the significance of the study, the research questions and hypotheses, and the definitions are detailed and discussed.

Background

The nursing shortage is expected to continue and worsen over the next decade, and many contributing factors exist. One of those factors is that not enough nursing students are able to complete their undergraduate programs successfully (Buerhaus, 2021). The reasons for nursing program attrition are multifactorial and have been widely studied, but further research is needed for continued improvement (Jeffreys, 2012). Retention of both traditional and nontraditional nursing students in pre-licensure nursing programs continues to be essential in helping meet national healthcare needs. Institutions of higher education and nursing programs are charged

with developing new and innovative retention strategies to help meet this supply and demand (Jeffreys, 2022). The study of undergraduate prelicensure nursing student retention strategies may improve student outcomes and the nursing shortage.

Social Context

The national nursing shortage is an ongoing phenomenon of interest. National nursing shortages have occurred since the 1960s and have severe, long-lasting effects on access to care, quality, safety, and healthcare costs (Buerhaus, 2021). One report declares that the current national nursing shortage is expected to continue and projects that during this decade, 640,000 more registered nurses (RNs) will retire, creating a more significant mismatch in supply and demand (Buerhaus, 2021). Another source projects a national deficit of 918,232 RN jobs by 2030 as a direct result of an increase in the aging adult population, including aging nurses in the workforce (Juraschek et al., 2019). Fewer nurse-to-patient ratios create a 'perfect storm' for errors and increased morbidity and mortality rates (Haddad et al., 2022). The deficit of nurses in the workforce is having a significant negative impact on patient care and outcomes.

Nursing shortages are challenging to overcome, can overwhelm the healthcare system, and occur due to many factors. Factors such as the retirement of baby boomer generation RNs that began in 2010 (Buerhaus, 2021), the COVID-19 pandemic (Buerhaus, 2021), and the inability of undergraduate nursing programs to admit and graduate enough qualified applicants from their programs (AACN, 2022) have decreased the supply of RNs in the workforce. The projected supply of new graduates, 195,400 (AANC, 2022) still falls short, leaving the profession in a critical state as the national job growth outlook for RNs from 2021-2031 is reported at 6%, which equates to 203,200 openings (United States Bureau of Labor Statistics,

2022). This mismatch in the supply of new nurses and the demand of future nursing job openings may also have a significant negative impact on patient care and outcomes.

While the aging population and the recent pandemic are major contributing factors to the national nursing shortage, they are not the only causes. The inability of undergraduate nursing programs to admit, retain, and graduate enough students ready to enter the workforce adds to the nursing shortage and is expected to continue. According to the American Association of Colleges of Nursing (2022) nursing programs turned away more than 91,000 qualified applications listing reasons such as nursing educator shortages and insufficient clinical sites, to name a few. Turning away qualified potential students from nursing programs is a serious consequence of insufficient resources, especially considering the current and projected national nursing supply and demand needs. However, despite current efforts to graduate more nursing students, attrition and retention of these students continues to be a problem.

Because nursing programs are not able to admit all qualified nursing student applicants, nurse educators are concerned with preventing attrition of those who are admitted. According to Lewis et al. (2019) attrition of healthcare students, particularly nursing students, is a national concern that has been studied for decades and continues to be a phenomenon of interest. Attrition rates for first semester nursing students in the United States are reported as high as 50%, and even higher for minority students, with most students leaving their programs in the first semester owing to academic, personal, and/or financial factors. With attrition rates of this magnitude, especially occurring during the first semester, early implementation of nursing student retention strategies is a priority.

Attrition from nursing school programs appears to have multiple factors. Attrition occurs more often because of many interrelated pathways that interfere with retention and progression

(Jeffreys, 2020). Nursing student attrition refers to voluntarily or involuntarily leaving the program before completion and affects both traditional and non-traditional students. Many of these students enter undergraduate nursing programs and may not fully comprehend the time commitment and other program demands required for successful completion.

Attrition has also been explained as a dynamic, complex, non-linear issue. For example, Hamshire et al. (2019) describe attrition as a problem with many interrelated factors and state that the implications of nursing student attrition are costly to higher education institutions, affect the attainment of program outcomes, and impact the healthcare industry's ability to meet supply and demand. Furthermore, the authors state that several large-scale, multi-institution, longitudinal studies have found that associated factors for student attrition are multifactorial, interrelated, and difficult to address, while small-scale, single-institution studies focus on specific interventions that may only be applicable in certain contexts. Understanding the multidimensional problem of nursing student attrition may help nurse educators to create strategies for retention. The creation and implementation of nursing student retention strategies, particularly for first semester nursing students may improve attrition rates.

Historical Context

Retention of students in higher education has been studied for decades. Retention of nursing students is an ongoing topic of interest among nursing programs in higher education institutions and is a global concern. Berger et al. (2012) report that early studies on student retention research focused on student demographics and later shifted to include student personality characteristics, socialization, and persistence. In the early 1960s, the demand for higher education increased. Because of that, systematic student retention research began with the works of Feldman and Newcomb (1969), Astin (1967), and Spady (1970), who studied the

impact of college on students and student retention. Later, in 1975, Tinto created an interactionalist student retention model, which built upon those earlier works, leading to student retention theory development and sparking the interest of thousands. These theorists seem to have paved the way for the development of universal retention frameworks that are discipline-focused.

Recent studies on nursing student retention and the multifactorial causes of attrition support the need for ongoing research and development of retention strategies. For example, in response to high attrition rates in their nursing program, Fagan and Coffey (2019) report the effects of a pilot bridge course that was implemented for students entering their first year at a small university nursing program and studied its effects on attrition. They proposed that the creation of early orientations and bridge courses may have a lasting effect on new nursing students facing the rigors and demands of the program that they may not be adequately prepared for. There remains a need for more research that includes diverse student demographic characteristics, in a varied geographic area.

A lack of help-seeking behaviors among nursing students may also affect retention and attrition rates. Everett (2022) found that personal, social, and environmental factors affect help-seeking behaviors among nursing students. Furthermore, the author states that the implementation of interventional models that focus on student success may improve nursing students' help-seeking behaviors, ultimately leading to better retention rates, especially among first semester students. The researcher states that new success models can help students in personal growth and skill development by providing a supportive learning environment to promote help-seeking behaviors. This points to the need for further research that explores factors affecting nursing student help-seeking behavior. Nursing educators are well positioned to help

identify students who may be at risk of attrition and charged with development and implementation of such interventions to retain nursing students.

Theoretical Context

Tinto's (1975, 1993) Student Retention Theory provided the theoretical support for this study. Tinto's theory (1975, 1993) offered solid theoretical support for creating student retention strategies that integrate new nursing students into the culture and profession of nursing. Tinto's theory suggests that persisting and remaining enrolled is determined when students are integrated through adequate interactions with other individuals within the educational community and connect with similar abilities, goals, and values (Shelton, 2012). Tinto's theoretical assumptions related to student integration underpin the student nurse boot camp experience under study.

The study of student retention in higher education focuses on both institutional and student interests. For example, Tinto (2017) reports that historically, student retention was shaped and viewed based on institutional action. Furthermore, student persistence and student retention are related terms; however, depending on one's perspective and interest, persistence and retention are different, and students seek to persist rather than be retained. In addition, the author poses that institutional interests in student retention lie primarily in increasing graduation numbers. The student's interest lies in degree completion, and that social and academic institutional systems influence student integration and reinforce student persistence.

With the national nursing shortage looming, it is more important than ever to see more nursing students be retained and succeed in their undergraduate programs with the ultimate goal of passing the NCLEX-RN, entering the workforce, and meeting the healthcare supply demands. Proactive retention strategies that begin early in the nursing educational journey, such as a pre-nursing boot camp, may help meet this demand.

Problem Statement

There is a critical need to increase the national supply of nurses to address the nursing shortage. The United States Bureau of Statistics, Department of Labor (2022) projects that an estimated 3.3 million nurses will be needed by 2031. According to Haddad et al. (2022) the American Nurses Association (ANA) reports more available jobs for registered nurses in the United States than any other profession. Additionally, Cusick et al. (2022) discussed reasons for the nursing shortage, which are plentiful and multifactorial, with no one or combined strategy to date that has provided a resolution. Increasing the number of nursing graduates by improving retention and completion rates is a strategy that could help mitigate the problem.

Early implementation of nursing retention strategies may improve attrition rates in undergraduate nursing programs. According to Everett (2020), risk factors for nursing student attrition must be identified, and strategies implemented early in the educational journey. Incorporated as early as the first semester, these strategies may decrease attrition rates and improve nursing student retention. Furthermore, there is a pressing need for nursing educators to address nursing students' academic challenges and to facilitate the knowledge, attitudes, and skills that will socialize them into the nursing culture and improve help-seeking behavior, which may lead to better retention rates. Students may not know when or how to ask for help, so it is essential for nursing educators to inform students early on about resources available within their nursing programs and higher education institutions. The earlier students seek help, the greater chance they have of success.

Further research is needed to improve nursing student retention and completion rates for both traditional and nontraditional students. Underrepresented students are increasingly enrolling in nursing programs but have lower retention and graduation rates than other groups of students

(Jeffreys, 2022). The United States population is becoming increasingly diverse, and there is a need to retain more students from diverse underrepresented groups, especially men, African American, Hispanic, Asian, American Indian, and Alaskan native individuals in nursing (AACN, 2023). The AACN calls for more to be done so that the nursing workforce is adequately prepared for and represents the population it serves. Research studies that investigate retention strategies with the potential to promote retention and success of the increasingly-diverse nursing student classrooms are needed to further add to the current body of knowledge.

Attrition is a major issue that challenges nursing educators to come up with ways to keep students from leaving the program. Fagan and Coffey (2019) state that reducing nursing student attrition is essential for students, academic institutions, and the healthcare industry. The challenge for nursing educators is to create strategies for addressing the complexity of why qualified, motivated students leave their programs. Jeffreys (2022) agrees that nurse educators can help decrease attrition by implementing successful strategies to increase student nurse retention. A pre-nursing program boot camp is a strategy intended to meet these retention challenges.

Additionally, nursing program completion is a program outcome that is monitored by the program's accrediting body. The Accreditation Commission for Education in Nursing (ACEN) (2020) Standard 5 includes in its criterion that nursing schools must track, analyze, and report the nursing program completion rate. According to the updated 2023 Standards and Criteria, Standard 5, Outcomes, Criterion 5.2 requires that nursing programs demonstrate that students achieve program outcomes, including their completion rate. The standard says that the program administrators must assess completion on an ongoing basis and document their analysis of the assessment data for program decision-making. Benchmarks must be set and reported annually to

the ACEN. If benchmarks are not met, then actions must be implemented to maintain and improve the completion rate.

No doubt nursing educators have a major responsibility in maintaining the nursing program. The problem is an ongoing need to create innovative, successful, and sustainable strategies to aid in the retention of nursing students. A study using a pre-nursing boot camp was needed to expand the literature further and help cultivate best practices for nursing student retention.

Purpose Statement

The purpose of this non-experimental correlational predictive quantitative study was to investigate the relationship between successful first semester completion and retention to the second semester after boot camp participation in an ADN program at a community college in the rural Southwestern region of the United States. The study sought to discover predictive correlations to student age, categorized by generational cohort, gender, race, and financial aid status with successful first semester completion and retention of nursing students after boot camp participation in the same sample. A retrospective approach was used to collect student demographics, enrollment, progression, and boot camp participation records. The variables for research question one were successful completion of the first semester and enrollment in the second semester after boot camp participation. The predictor variables for research question two were student age, categorized by generational cohort; gender; race; and financial aid status; and the criterion variables were successful completion of the first semester and enrollment in the second semester after boot camp participation. Archival student data from the program's last five years, including 2018, 2019, 2020, 2021, and 2022, was collected and analyzed. It was

anticipated that the findings from this study may give nurse educators insight into the effectiveness of holding a boot camp and possibly informing further plans for student retention.

Significance of the Study

Nursing student retention has been widely studied and is well documented in the literature. Further research is still needed to discover successful interventions as nursing educators continue the quest to retain and graduate their students (Jeffreys, 2020) which will work towards improving the nursing shortage (Buerhaus, 2021). There are many reasons why the retention of nursing students is important. First, retention and successful completion of a nursing program are crucial for students, nursing educators, higher education institutions, the healthcare system, and most importantly, the patient populations they will serve.

Improved retention of nursing students is significant to nursing and nursing practice because it can lead to more graduate nurses ready to enter the workforce and decrease the nursing shortage (Buerhaus, 2021). Secondly, higher education institutions and nursing programs must meet program outcomes to maintain high standards for credibility and accreditation (ACEN, 2020). Student completion is a program outcome that the nursing program and parent institution should monitor on an ongoing, proactive basis for quality improvement. The pre-nursing student boot camp was created to allow students to experience integration into the nursing program, interact and bond with nursing educators and peers, apply knowledge from pre-requisite courses, prepare for academic rigor, identify resources, and welcome them into the culture of the nursing program.

This study aimed to investigate the relationship between successful first semester completion and retention after participation in a pre-nursing student boot camp and to discover predictive correlations to student age, categorized by generational cohort, gender, race, and

financial aid status with first semester completion and retention after boot camp participation in an ADN program. Ongoing individual and collective nurse educator action in identifying student needs is important to make a positive impact on retaining nursing students. Nurse educators may be better able to answer that call by taking a proactive stance and examining student retention challenges (Jeffreys, 2022). Findings from this study revealed improved retention outcomes for nursing students who have participated in the boot camp, which is significant to nursing education research as it adds to the body of knowledge and informs strategies that improve retention. Insight into this population's diverse student characteristics provided additional information in helping nursing students succeed in this program predicting that generational cohort and race were statistically significant for first semester completion and retention to the second semester. New knowledge from this study related to student success and demographic correlations may also lead to improvements in strategies for successful interventions that will retain nursing students past the first semester.

Research Questions

RQ1: Is there an associative relationship between first semester completion and retention of nursing students to the second semester after boot camp participation in a pre-licensure, undergraduate ADN program at a community college?

RQ2: To what extent does student age, categorized by generational cohort, gender, race, and financial aid status predict successful first semester completion and retention of nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college?

Hypotheses and Null Hypotheses

H1: There is a statistically significant correlation between successful first semester completion and retention of nursing students to the second semester after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

H2: There is a statistically significant predictive correlation between nursing student generational cohort, gender, race, and financial aid status, and successful completion of the first semester and retention after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$1: There is no statistically significant correlation between successful first semester completion and retention of nursing students to the second semester after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$2: There is no statistically significant predictive correlation between student generational cohort and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$3: There is no statistically significant predictive correlation between student generational cohort and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$4: There is no statistically significant predictive correlation between student gender and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$5: There is no statistically significant predictive correlation between student gender and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$6: There is no statistically significant predictive correlation between student race and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$7: There is no statistically significant predictive correlation between student race and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$8: There is no statistically significant predictive correlation between student financial aid status and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$9: There is no statistically significant predictive correlation between student financial aid status and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

Definitions

1. *Associate degree in nursing (ADN)* – A two-year undergraduate academic degree in nursing from an institution of higher education, of which graduates are eligible to sit for the National Council Licensure Examination for Registered Nurses (NCLEX-RN) examination (Androus, 2023).
2. *Banner* – a comprehensive higher education enterprise resource planning system (ERP) housing student information including demographic data and transcripts (Ellucian, 2023).
3. *Dismissal* – involuntarily leaving a course or program (Jeffreys, 2020).
4. *Drop out* – voluntarily leaving a course or program (Jeffreys, 2020).
5. *Generational cohort* – A context-specific group of people born within the same year range. (Strauss & Howe, 1991, as cited in Campbell et al., 2020). “Individuals experiencing the

same historical or social events at the same point in the lifecycle may have their views and attitudes shaped differently than those who spent their formative years under different circumstances, which is the reason for generational variation" (Mannheim, 1991 as cited in Campbell et al., 2020, p. 928, & Pilcher, 1994).

6. *Generation Baby Boomers* – The cohort of persons born between 1946 and 1964 (Pew Research Center, 2018 as cited in Campbell et al., 2020).
7. *Generation X* – The cohort of persons born between 1965 and 1980 (Pew Research Center, 2018 as cited in Campbell et al., 2020).
8. *Generation Y/Millennials* – The cohort of persons born between 1981 and 1996. Also known as Millennials (Pew Research Center, 2018 as cited in Campbell et al., 2020).
9. *Generation Z* – The cohort of people born in 1997 or after. Also known as Post-Millennials (Pew Research Center, 2018 as cited in Campbell et al., 2020).
10. *Goal commitment* – "refers to a person's commitment to personal educational and occupational goals. It specifies the person's willingness to work toward the attainment of those goals" (Tinto, 1993, p. 43)
11. *National Council Licensure Examination for Registered Nurses (NCLEX-RN):* A standardized examination used by state boards of nursing to determine competence in nursing practice as a Registered Nurse (RN) (National Council of State Boards of Nursing, 2023).
12. *Non-traditional undergraduate nursing student* – "refers to a nursing student who is enrolled in an entry-level undergraduate nursing program (diploma, associate degree, or generic baccalaureate) and who meets one or more of the following criteria: (1) 25 years or older, (2) commuter, (3) enrolled part-time, (4) male, (5) member of an ethnic and/or racial minority

group, (6) speaks English as a second (other) language, (7) has dependent children, (8) has a general equivalency diploma, and (9) required remedial classes" (Jeffreys, 2012, p. 9).

13. *Nursing* – "the protection, promotion, and optimization of health and abilities, prevention of illness and injury, alleviation of suffering through the diagnosis and treatment of human response, and advocacy in the care of individuals, families, communities, and populations" (ANA, 2010, p. 8).
14. *Program outcomes* – "Measurable indicators that reflect the extent to which the purposes of the nursing program are achieved and by which nursing program effectiveness is documented" (ACEN, 2020, p. 11).
15. *Retention strategies* – Efforts and actions made by higher education institutions and faculty to successfully retain students to complete their courses, programs, and degree plans. (Jeffreys, 2020).
16. *Student attrition* – Voluntary (drop out) or involuntary (failure) departure of a student from an institution of higher education before completing a course, program, or degree (Jeffreys, 2020). Also referred to as student departure (Tinto, 1975).
17. *Student persistence* – Continued student enrollment from year two to graduation (Burke, 2019).
18. *Student retention* – Continued student enrollment from the first to the second year in a higher education institution (Burke, 2019). For the purposes of this study, retention is referred to as continued nursing student enrollment from the first semester to the second semester in the ADN program.
19. *Traditional undergraduate nursing student* – "refers to a nursing student who is enrolled in an entry-level undergraduate nursing program (diploma, associate degree, or generic

baccalaureate) and who does not meet the criteria of ‘nontraditional undergraduate student’…. Specifically, such a student meets all of the following criteria: (1) 24 years or younger, (2) resides in campus housing or off-campus housing, (3) enrolled full-time, (4) female, (5) White and not a member of an ethnic and/or racial minority group, (6) speaks English as a first language, (7) has no dependent children, (8) has a United States high school diploma; and (9) required no remedial classes” (Jeffreys, 2012, p. 9)

CHAPTER TWO: LITERATURE REVIEW

Overview

The supporting theoretical basis for this study is Tinto's (1975, 1993) Student Retention Theory. The synthesized literature review examines the current state and causes of the national nursing shortage, the problem of nursing student attrition, nursing student retention, and nursing student retention strategies. There is an ongoing need for further research to improve nursing student retention and completion rates for both traditional and nontraditional students. Chapter Two presents the supporting theory and organizational theoretical framework for the study and the literature review.

Theoretical Framework

Theoretical support for this study is based on Tinto's (1975, 1993) Student Retention Theory. Tinto (1975, 1993) presents theoretical views of student success in higher education as a multidimensional, multifactorial, iterative process. Tinto's theory is grounded in sociology, focused on factors that affect the retention of students in higher education, and presents a model for student persistence and integration. Tinto's theory supports student retention in higher education and can be applied by nursing educators to create innovative approaches to improve student success prior to, during, and beyond the first semester of an undergraduate nursing program.

Tinto's Theory of Student Retention

Student attrition and retention in higher education (HE) have been widely discussed and studied dating back to the 1950s (Burke, 2019). During this time, student attrition and retention were viewed in the realm of psychology in terms of student characteristics such as skills and individual motivational attributes (Tinto, 1975, 1993). By the 1970s, this view began to change

due to a better understanding about how people are influenced by society and their environment, and the focus started shifting to look at the relationship of the student with the institution and that influence on attrition and retention (Spady, 1970; Tinto, 1975). During this shift, new interactionalist retention model theories grounded in sociology emerged including the Undergraduate Dropout Process Model (Spady, 1970) and the Institutional Departure Model (Tinto, 1975, 1993) and viewed student attrition and retention as they occur based on the relationship established or not established between student and institution.

Tinto's Theory of Student Retention (1975, 1993) stands on the shoulders of the Undergraduate Dropout Process Model (Spady, 1970), and applies Durkheim's Theory of Suicide and Van Gennep's Tribal Rituals and Rites of Passage Theory, in providing a longitudinal model of student departure that depicts the concepts of intellectual and academic integration into social communities within the HE setting that must be followed for student persistence to program completion. Tinto's theory assumes that students enter college with certain background variables related to family, individual attributes, pre-college schooling experiences and goal commitment for completion. Upon entering college, students have both academic and social interaction experiences that may either positively or negatively affect that goal commitment, thus affecting their decision to stay or leave.

Goal Commitment

Concepts that are central to this model include factors that shape the individual prior to entering the HE setting, and the effect of academic and social experiences and integration within the institution on goal commitment, as a student either persists on the path to completion or departs from the institution prior to completion (Tinto, 1993). For the student to achieve the goal of degree completion, Tinto states that early academic and social experiences, preferably

beginning in the first semester, are crucial to integrating the student into the program. This integration is necessary for supporting students as they persist in college and continue to further develop goal commitment, which leads to degree completion. Tinto's theory suggests that student persistence in HE is conditional based on access to student-focused, rather than institution-focused, retention programs that consider all student populations and offer social and academic integration (Chrysikos et al., 2017).

Tinto (1999) later theorized that students establishing relationships over time allows them to create a sense of community with peers and faculty, which helps to continue and grow integration within the HE institution. These relationships help the student to feel connected, which is central to Tinto's theory. Furthermore, it is important to understand why students may 'drop out' or 'leave' their programs in order to better understand how to help them stay until completion. Tinto's theory is heavily cited, well-accepted, repeated, and tested model, and has been reviewed in multiple contexts, making it credible and valid for research. The model has been applied in various contexts and in multiple types of HE settings.

Student commitment is often inherent in students who are entering nursing programs as they have a strong desire to enter and complete the program (Hovdhaugen et al., 2023). However, integration into the nursing program within the institution must take place at the beginning of the program, ideally prior to entry, for the greatest chance of student progression and completion (Thomas et al., 2023). Tinto's theory is suitable to support this study because the nursing program can be likened to a tribe with its own culture, rituals, and rites of passage.

Social and Academic Integration

Students are not new to college when they enter nursing programs, as they have already completed college courses as pre-requisite requirements to the program, but they have not

experienced college in the context of a professional nursing program and must make that transition to the nursing program culture and nursing profession to be successful. Nursing programs have rules and policies that are intended to begin the process of shaping professional identity (Hovdhaugen et al., 2023) as a characteristic that is expected in nursing. The programs also have objectives to be met, with skills and levels to be achieved to progress and complete the program. Unfortunately, many of the students who enter the program are not prepared for these expectations and depart from the program before progressing past the first semester (Lewis et al., 2019). The reasons are often multifactorial and may include poor academic performance and lack of consistency in relationships with support services, peers, and faculty (Canzan et al., 2022).

Tinto (1999) argues that incoming first semester students must experience a successful social transition to develop new relationships and build a sense of community in order to persist and be successful. New values, priorities, and behaviors are learned in the academic as well as the social environments with decisions to leave grounded in one of these factors. Tinto's model can be applied by nurse educators to improve the retention of nursing students (Appendix A).

Related Literature

The national nursing shortage is an ongoing, multidimensional concern with consequences affecting healthcare access, quality, safety, and costs. Impacts to patient safety and outcomes can be disastrous and more should be done to correct the mismatch in supply and demand (Buerhaus, 2021). Nursing student attrition and retention are also important factors to consider, as they may either negatively or positively impact the current state of the national nursing shortage. The following literature review includes the current state of the national nursing shortage and current higher education issues such as nursing student attrition, nursing student retention, and retention strategies that may improve the national nursing shortage.

Current State of the National Nursing Shortage

There are numerous contributing factors to the nursing shortage including nurse burnout and turnover, career and family choices and obligations, geographical location of nurses, and healthcare setting violence (Haddad et al., 2022). Nursing educator shortages have also been cited as a major contributing factor to the national nursing shortage (Juraschek et al., 2019). These factors have major implications and are of clinical significance as they affect staffing ratios leading to errors and higher morbidity and mortality rates (Haddad et al., 2022).

Nursing Shortage – Quality and Safety

Safe staffing ratios have been a priority for nurses, as well as their patients, for many years. Haddad et al. (2022) report that high patient-to-nurse ratios contribute to the nursing shortage and have been associated with decreased safety and quality in patient care as well as decreased job satisfaction for RNs. Cho et al. (2020) found that RNs with high patient-to-nurse ratios (11.9 patients to one nurse) report a high prevalence of missed care, leading to a decrease in quality and safety, patient satisfaction, increased patient morbidity and mortality rates, and increased intent to leave their jobs. Haddad et al. (2022) encourages organizational creativity to meet both the nurses' and patients' needs by empowering nurses with autonomy in staffing ratios by considering both volume and acuity of patients to improve the nursing workforce. Nurse educators can help improve nurse-to-patient ratios by retaining more of their nursing students through graduation and licensure to enter the workforce.

Nursing Shortage – Current Contributing Factors

Haddad et al. (2022) state that nurses make up the largest section of the healthcare profession reporting 3.9 million nurses in the United States with a projected growth rate of 9% by 2026, which is faster than all other occupations. Buerhaus (2021) describes national nursing

shortages as severe and long-lasting, likening them to category five hurricanes which affect the entire nation rather than only one region. Buerhaus (2021) states that recent pre- and post-pandemic factors creating national nursing shortage conditions include the retirement of baby boomer RNs which make up roughly one-third of the nursing workforce; rapid increase in the advanced practice nursing workforce, leaving bedside nursing positions to return to school; increasing growth in inpatient and outpatient care settings; and the COVID-19 pandemic, which has had many implications and caused an increased need for critical care nurses. Furthermore, the author states that the loss of the baby boomer RNs (about 640,000 nurses) during this decade, will be like losing over two million years of nursing experience annually. One solution that promises to decrease the nursing shortage is to increase the number of undergraduate nurses ready to fill these bedside RN positions.

Nursing Shortage – Nursing Educations' Role

The national nursing educator shortage is a major contributing factor to the national nursing shortage. Nurse educators drive nursing education and are key stakeholders who can improve the nursing shortage through educating students and facilitating their entrance into the profession (Mariani, 2022). The lack of nurse educators to fill faculty positions has a significant impact on the overall national nursing shortage (AANC, 2022). The national nursing educator vacancy rate is growing and was reported at 8% as of August 2022 (Bakewell-Sachs et al., 2022). Like the national nursing shortage, the nursing educator shortage has numerous causative factors, including lack of funding for the completion of master's and doctoral degrees that are required for nurse educators, as well as low salaries compared to nurses who work in clinical areas (Mariani, 2022). The nursing educator shortage contributes to limitations on the number of students who can be admitted to undergraduate nursing programs, in part, due to regulations

from state boards of nursing (BON) as described below. Nurse educator shortages lead to fewer students being able to participate in required clinical assignments.

State boards of nursing regulate the number of nursing students to nurse educator ratios in the clinical setting which varies from state to state, further limiting the number of qualified students admitted. For example, the state of Washington has a ratio of 10 nursing students to one nursing educator (10:1) (Washington State Legislature, 2016) in the clinical setting; New Mexico has a ratio of eight nursing students to one nursing educator (8:1) (New Mexico BON, 2022); Texas has a ratio is 10 nursing students to one nursing educator (10:1) (Texas BON, 2019); and in Florida, the ratio is 12 to 18 nursing students to one nursing educator, depending on clinical site regulations (12-18: 1) (Florida BON, 2019). These student to nurse educator ratios are necessary to provide safe clinical experiences. However, nursing educator shortages make it difficult to reach the new nurse graduate numbers needed to improve the nursing shortage.

As stated previously, the inability of undergraduate nursing programs to admit, retain, and graduate enough students ready to enter the workforce adds to the nursing shortage and is expected to continue. According to the AACN (2022) nursing programs turned away more than 91,000 qualified applications, listing reasons such as nursing educator shortages and insufficient clinical sites, to name a few. Likewise, Bakewell-Sacks et al. (2022) report that of the 91,938 students who were turned away, more than 76,000 were qualified applicants to entry-level BSN programs. Furthermore, Gazza (2019) poses that turning away qualified potential students from nursing programs is a severe consequence of insufficient resources, especially considering the current and projected national nursing supply and demand needs. Nursing programs may be able to help bridge the gap by supporting new incoming nursing students with retention strategies that may increase the number of new nurse graduates ready to enter the practice.

First Semester Reality of Undergraduate Nursing Programs

Students entering the first semester of undergraduate nursing programs may have to face a new reality as they transition to the demands and rigors of the program. Tinto (2006, 2017) describes the student transition to higher education in the first year as a critical process in the development of student persistence. Students enter college with a goal commitment to complete pre-requisite course work successfully to apply and be accepted in an undergraduate nursing program as part of that transitional process. However, the reality of the first semester of college may be quite different from the reality of the first semester of an undergraduate nursing program.

Undergraduate nursing programs are competitive with differing admission requirements, including, but not limited to, grade point average (GPA) requirements, standardized entrance exam requirements, minimum grades for pre-requisite course work, and interviews (Sullivan, 2023). Nursing students are required to be critical thinkers and make clinical judgements, so they must develop higher order thinking and learning and move from rote memorization of knowledge to application and analysis. Furthermore, poor academic outcomes are often related to test-taking difficulties as students experience test anxiety, have unrealistic expectations, or are not adequately prepared for examinations (Jeffreys, 2012).

Reality and Transition into the First Semester of a Nursing Program

Reality and transition into the first semester of a nursing program is a phenomenon that many new nursing students may find difficult. For example, Glerean et al. (2017) state that nursing student views of what it means to be a nurse are often out of touch with the actual reality of what professional nursing entails. Many students may not understand the complex role of nurses in the healthcare setting. In fact, the authors state that younger persons' views of nursing are not realistic, as many regard nurses as less intellectual and inferior to physicians.

Furthermore, they do not comprehend what it takes to enter the nursing profession, especially the educational requirements. Kalisch et al. (2007) state that the image of nurses is a significant problem across the globe, in part due to negative and inaccurate media coverage. Through the media's lens, people may view nursing as glamourous and lacking professional characteristics. Consequently, this view may impact the quality and quantity of those choosing to enter nursing programs.

The highest occurrence of attrition from nursing programs occurs in the first semester (Jeffreys, 2012). The first semester of undergraduate nursing programs may be much different than what pre-nursing students anticipate when compared to their previous experiences in higher education. One study used a retrospective evaluation design to assess the entry, progression, graduation, and licensure characteristics of ADN students (N = 112). This study examined retention and attrition trajectories of ADN students and found that 9% (n = 10) of the sample failed out of their program during the first semester, and 14% (n = 15.6) left the program voluntarily at any point in the curriculum (Jeffreys, 2007b).

Some nursing students also experience other stresses including perceived cultural incongruence, fear of discrimination and bias, acculturation stress, student-role incongruence, womanistic identity career choice pressures, caregiver role stress, and parental role stress (Jeffreys, 2020). For example, one study reported that these stressors not only affect students' academic and psychological outcomes but may also affect their general well-being (Alghamdi et al., 2019). A two-part questionnaire was administered to a sample of second-year female nursing students in Saudi Arabia (N = 87). Part one was a sociodemographic characteristics questionnaire, and part two was the Student Nurse Stress Index (SNSI). The researchers report that all participants in this study identified academic load as (M = 3.38, SD = 0.83), interface

worries (worry about poor public image of nursing) (M = 3.22, SD = 0.79), clinical concerns (M = 2.80, SD = 0.78), and personal problems (M = 2.43, SD = 1.02) as major stressors. Furthermore, they found significant associations between monthly income and academic load (p = .002), clinical concerns (p = .049), personal problems (p = .000), and interface worries (p = .024) as major stressors. These stressors may increase student attrition rates in nursing programs.

Many students enter the first semester of an undergraduate nursing program with preconceived notions about being an RN and may underestimate the challenges they may face as beginner nursing students (ten Hoeve et al., 2017). Consequently, misperceptions between expectation and reality are often the cause of premature attrition in nursing students. One exploratory descriptive study of student nurses (N = 17) in the Netherlands found that students' selfless and professional perceptions of the nursing profession as they entered their programs changed to disappointments as they progressed, failed out, or chose to leave. Through semi-structured interviews of the participants, the researchers found that students left due to the nature of the program, clinical placements, and perceived lack of support from mentors and nursing educators. Furthermore, the students stated that feeling welcomed and working with a nice team were important reasons for them to stay in the program (ten Hoeve et al., 2017).

First semester nursing students often state that they had no idea how difficult and challenging the program would be regarding the academic rigor and time commitment (Everett, 2022). Furthermore, these students often lack help-seeking behaviors which may add to the increase in first semester failure or drop-out rates. In an exploratory study conducted among a group of diverse first semester nursing students (N = 31) enrolled in an ADN program at a community college in the United States, the researchers found that the primary factors associated

with lack of help-seeing behaviors included lack of time (*n* = 15, 48%) and shyness (*n* = 13, 42%).

Some students have low confidence in test-taking abilities, while others are overly confident, both of which can have a negative effect on student outcomes (Jeffreys, 1993, 1998). Test-taking difficulties and increased stress may be worsened by the requirements of high-stakes examinations which must be passed for the student to progress in the nursing program. Take, for example, dosage calculations examinations, which students are required to pass with a perfect score (Middleton et al., 2022). Another type of high-stakes examination involves psychomotor skills checkoff examinations during which students must perform skills without missing critical safety points in front of their nursing instructors (Aslan & Erci, 2021).

Beginning nursing students need guidance with self-appraisal and may need special assistance in the development of study skills for staying motivated to learn (Jeffreys, 2012). These students often have difficulty with the transition into their nursing programs. Prior study habits may need to be adapted for success in the professional type of education offered in nursing programs. Pre-nursing students have completed many hours of pre-requisite coursework as required for admission and have already transitioned into life as a college student in the higher education setting. Although they have gone through this transition period, another transition awaits them as they apply to and are accepted into their undergraduate nursing program of choice.

Rossato et al. (2022) conducted a study focusing on transition and adaptation of first year undergraduate nursing students (*N* = 136) using qualitative thematic-reflexive analysis. During reflective group sessions with participants, the researchers found that several things can lead to first-year nursing student failure including: lack of preparation by student nurses for nursing

courses, and misconceptions about nursing program expectations, (i.e., time management, inadequate study skills, inappropriate professional behaviors, excessive course workload, psychological pressure, immaturity, and lack of financial resources). According to these findings, the researchers postulate that continuity of welcoming activities and ongoing monitoring of first year nursing students may help them adapt and transition into their programs.

According to Hughes et al. (2020) challenging coursework, initial clinical placement, and caring for patients add to student stress during this transitional period. At this point, the authors state that nursing students go through another period of transition and integration into the culture of nursing and begin developing a professional identity. Hughes et al. (2020) explored the transitional experiences of first-year undergraduate nursing students ($N = 42$) in a qualitative study using thematic analysis. Through six semi-structured focus groups, the researchers identified four themes that students perceived as either facilitating or inhibiting their transition including learning through others (peers, faculty, staff), confronting postsecondary demands (time management, clinical practice, communication, transition from high school to university), importance of relationships (family, peers, educators), and transition of self (perceptions of self-growth, self-awareness, and development of strategies for success). The researchers state that based on these findings, there is a need for faculty-supported strategies for nursing students as they transition to their nursing programs. Furthermore, the researchers recommend emphasizing the need for professional identity development early in the curriculum to facilitate transition into the first year of the nursing program.

Reality and Professionalism Among Traditional and Non-Traditional Nursing Students

Poorchangizi et al. (2019) suggest that the future of nursing relies on the purposeful integration of professional values in nursing students. To achieve this, nursing students should be

socialized and integrated into the culture of the nursing program during the first semester while absorbing professional ethics and values and be supported in these values through program completion. These researchers conducted a cross-sectional study involving undergraduate nursing students ($N = 100$) in Iran using a two-section questionnaire, student demographic data and the Nursing Professional Values Scale-Revised (NPVS-R), to determine student perceptions of the importance of professional values. Mean scores were calculated on the NPVS-R (reliability of 0.91 using Cronbach's alpha) with scores above 86 considered high importance. The researchers found significance in that students indicated high awareness and perceptions of professional values dimensions (mean score = 101.79, SD = $\pm$ 12.42) including trust, justice, professionalism, activism, and caring, and that there was a statistically significant relationship with students' GPA ($r = 0.29$, $p = <0.003$). Furthermore, the authors suggest that nurse educators support students' development of professionalism by implementing periodic classes and seminars about professionalism.

Thomas et al. (2023) argue that for most nursing students, a traditional student identity is unappealing. Non-traditional nursing students' experiences are very different from those of traditional students due to the learning workload, clinical placements away from campus, and limited time to engage in social interaction with other college peer groups. For example, Sweetman et al. (2022) found that integration of nursing students into the professional role is an ongoing process, and that even though nursing students have a strong commitment to being a nurse, they have weak commitment to being a student nurse. The researchers suggest that students are committed to a 'future identity' as a professional nurse rather than the 'present identity' as a student nurse.

Non-traditional first semester nursing students may face many new realities upon entering ADN programs in community colleges. Margarit and Kennedy (2019) report that first semester students in community colleges represent a population in higher education that is becoming more diverse and have higher numbers of non-traditional students than four-year universities. They posit that the large number of diverse, non-traditional students in community colleges may not have time to socialize on campus and that there is a need for social and academic integration strategies which may influence persistence to timely graduation. The researchers conducted a study that explored the relationship between first-time community college students' background, financial, and academic data, and persistence to timely graduation in central Florida. A questionnaire, guided by Tinto's (1975) integration model, using a 5-point Likert-like scale, with "Yes" and "No", and open-ended questions was developed by the researchers and distributed electronically my email. A total of 3,884 surveys was sent out. The instrument was used to collect the study data from past community college students ($N = 91$, 2.4% response rate). The researchers found a strong, positive correlation between student persistence and college satisfaction ($r = .52$) and negative correlations between the need for financial aid support ($r = -.45$) and working to support family ($r = -.44$) and college satisfaction ($r = .39$). This further emphasizes that correlations exist between nursing student success and retention strategies that support integration and socialization into nursing programs.

Everett (2022) states that first semester undergraduate nursing students, especially in ADN programs, are often non-traditional students who work full-time. These students often have family responsibilities and underestimate the time commitment necessary to be successful in nursing school. These same students successfully completed their pre-requisite courses while juggling multiple responsibilities, but do not anticipate the demands and commitments associated

with an RN program. This reality sets in after they are fully immersed in the program, and many students have difficulty adjusting. Furthermore, they may lack help-seeking behaviors due to personal, social, and environmental factors and view the learning environment as non-supportive. Jeffreys (2020) adds that not only do students in the first semester underestimate the time commitment, but they also do not fully realize the requirements of academic and psychomotor skill performance, endurance, and emotional regulation that being a nursing student needs.

Nursing Student Attrition

Attrition, or student departure (Tinto, 1975), from higher education (HE) institutions has been a widely studied phenomenon of interest receiving a great deal of attention over the past several decades (Tinto, 1993). Attrition can be categorized into three groups: student attrition, institutional attrition, or system attrition based on the perspective of departure (Tinto, 2012a). For example, student attrition refers to college students who depart before degree completion, institutional attrition refers to departing from a particular college, and system attrition refers to higher educational system departure.

Although this phenomenon has been studied extensively (Tinto, 2012b), there is still much to learn about why students leave before completing their degrees and researchers continue to seek answers. Reasons for attrition, in any category, are often multifactorial and multidimensional and can be either voluntary or involuntary (Jeffreys, 2012). Voluntary attrition occurs when the student decides to leave college due to personal reasons, while involuntary attrition occurs when the student fails academically, clinically, or is dismissed for behavioral reasons. Consequently, student attrition varies depending on the semester, with the highest rate occurring in the first year and declining over subsequent semesters (Tinto, 2012a). Students admitted to undergraduate nursing programs must be supported prior to and through graduation

and licensure (Canzan et al., 2022). Therefore, understanding reasons and risks for attrition in HE, and more specifically in nursing programs, is of utmost importance in the quest for createing and implementing strategies for retention (Canzan et al., 2022).

First semester attrition student attrition occurs during the first nursing course with or without reapplication and readmission to the same program, irrespective of the reason (Jeffreys, 2012). This often occurs due to the pool of applicants that are not well prepared academically and who are increasingly nontraditional. The consequences of attrition, whether from voluntary or involuntary causes, is costly to students, higher education institutions, faculty, and society and may impact students psychologically. Attrition from nursing programs, like other programs and areas of study in higher education, can occur for many reasons, with more students leaving their programs in the first semester than in subsequent semesters.

Hamshire et al. (2019) discuss healthcare student attrition as an international concern and report that in the United Kingdom, as many as a fourth of the nursing students withdraw from nursing courses before completing their programs. The researchers conducted a regional cross-sectional study, across nine Northwestern England institutions in 2013 ($N = 1080$) and 2015 ($N = 1983$), to identify factors contributing to attrition in nursing and healthcare students. Of this sample, 77% were nursing students ($n = 2358.5$). In this study, the researchers surveyed students with two separate surveys and found that student perceptions of their learning experiences and consideration for leaving their programs had not significantly changed despite the university's efforts to improve the student completion rate. Hamshire et al. (2013) found that 47% ($n = 465$) of students indicated consideration of leaving their program. In this first survey, students gave detailed comments which led to three major themes including dissatisfaction with academic workload and support, difficulties associated with clinical placements, and personal concerns and

challenges. Similarly, in 2015, the survey results revealed that over 42% (n = 735) of students considered leaving their programs. Open comments were also collected regarding reasons for wanting to leave and three major themes emerged. The three major themes that emerged from their study included student concerns related to personal circumstances, workload pressure, and clinical placement culture.

Barbé et al. (2018) studied determinants of attrition of first semester undergraduate nursing students (N = 164) and found a statistically significant relationship between variables. Social determinants associated with attrition in this study included birth outside the U. S. (p = 0.043), parents born outside the U. S. (p = 0.001), English as a second language (p = 0.001), and racial/ethnic diversity (p = 0.002). Furthermore, the authors pose that these determinants are multifaceted and interrelated including individual student characteristics, institutional processes, and social, political, and economic factors. The researchers urge early recognition of social determinants, as well as academic factors, and stress the importance of a better understanding to guide interventions that will improve nursing student retention and success. Eudy and Brooks (2022) discovered similar findings when they explored student success in an ADN fundamentals course (N = 351) in the Southwestern region of the United States. By using Jeffreys' NURS model as a framework, they identified a significant association between student identified races, among other variables, as a predictor of successful completion. The researchers found that students who identified as Caucasian were more successful than those students who identified as African American, Hispanic, or another race (p = 0.01).

Another quantitative research study explored pre-registration nursing students' (N = 725) demographic factors including age and gender as a barrier to successful completion of undergraduate nursing programs in Scotland (Wray et al., 2017). Findings did not reveal a

statistical significance regarding male gender as a barrier. However, this study revealed a significantly higher probability ($p = < 0.05$) that older nursing students were more likely to progress than those who are younger with a mean age of the participants at entry reported as Mean = 25.3 (SD = 8.39). These findings are inconsistent with other studies in nursing and higher education which indicate that male gender and age may have a significant negative impact on student progression and completion (Powers et al., 2018). For instance, a smaller study used a qualitative descriptive phenomenological methodology to explore the lived experiences of former male nursing students ($N = 11$) who were unsuccessful in an undergraduate nursing program in the Southwestern region of the United States (Powers et al., 2018). Participants in this study identified gender bias, being singled out, gender role stereotyping, limitations on the clinical setting, and lack of male role models as barriers to success in the nursing program. The researchers state that more research is needed to explore male nursing student experiences and to inform strategies aimed specifically at retention of these students.

Psychological and student affective factors are also found in the literature as potential predictors of student attrition. According to Dancot et al. (2021) low self-esteem has been shown to contribute to first-year nursing student attrition. In their cohort design quantitative study of beginning first-year undergraduate nursing students (N=464), they found a significant association between low self-esteem ($p = 0.0001$; 95% CI) and drop-out, with female students (44.9% of 382 total females, $n = 171.5$) having lower self-esteem than males (68.8% of 81 total males, $n = 55.7$). Other significantly-associated factors found to impact self-esteem included academic performance and stress. The researchers suggest that consideration of measures to foster self-esteem for beginning undergraduate nursing students may support their retention in the program.

In their qualitative descriptive study, Canzan et al. (2022) interviewed nursing students ($N = 31$) who left their first-year undergraduate nursing program and discovered recurrent themes. These included: incongruence between personality and suitability for the nursing profession, lack of coping skills, misconceptions about professional image, the actual reality of what being a nurse really looks like, disappointing clinical experiences, and perceived lack of support from clinical nursing educators. Based on these findings, the researchers recommend reaching out to high school students with opportunities to explore nursing and what the profession is about. This could help them be better informed before choosing it as a career and creation of intensive summer school programs for struggling students to get them ready for the rigors of the program.

Additional qualitative studies explored attrition through the lived experiences of undergraduate nursing students in the United States. One narrative-inquiry study, across three campuses in the Southwest region of the United States focused on intrinsic and extrinsic factors to glean information about female ($n = 27$) and male ($n = 10$) undergraduate nursing student ($N = 37$) perceptions and stressors related to their unsuccessful experiences (Veesart & Cannon, 2023). The researchers state that more than 50% ($n = 18.5$) of the participants were minorities. All students in this study were reported to be above average academically based on the nursing program admission criteria. Students in this study identified life events as the most predominant theme (illness, loss of work, and mental health concerns) and study time (challenges of studying, or not knowing how to study for nursing school) ($n = 34$) as having the greatest impact leading to attrition out of the program. The researchers in this study suggest that admission criteria be inclusive of stress management and outside factor evaluation of nursing student applicants in addition to the usual academic requirements.

Gipson-Jones (2017) conducted a qualitative study interviewing 21 undergraduate underrepresented minority nursing students in the Northeastern region of the United States to explore facilitators and barriers to program progression. The researcher found that students identified barriers such as poor high school preparation (86%, *n* = 18), unsupportive peers/peer interactions (29%, *n* = 6), stigma of participation in Equal Opportunity Fund (81%, *n* = 17), financial instability (86%, *n* = 18), work/school/family imbalance, and psychological well-being (86%, *n* = 18) influenced their ability to progress in the undergraduate nursing program. In this study, the inverse of those factors were seen as facilitators to success.

Nursing Student Retention

Student retention continues to be a priority concern in higher education and nursing programs today and has been researched extensively (Tinto, 2017). Much like the causes of nursing student attrition, the concept of nursing student retention is multidimensional with no one-size fits all solution (Jeffreys, 2012). Despite this reality, it is also well-documented in the literature that a holistic approach to retention, with innovative strategies for success in higher education and in nursing programs, can proactively assist students in accomplishing their goals of nursing program completion (Jeffreys, 2022). As the study of student retention continues to grow and evolve, it is important to remember that retention is about students, and as the population of students continues to diversify, so must student retention strategies to meet their changing needs (Berger et al., 2012).

Nursing educators in higher education should seek to understand why students stay versus why they leave their programs as a more useful approach to student retention. Tinto (2012a) states that many researchers seek to find answers about student retention by focusing studies on why students leave college before completion. He further argues that researchers have

mistakenly assumed that focusing on reasons for attrition will provide answers in improving retention, stating that even though the two may be related, they are not the same. Furthermore, more research is needed that specifically focuses on effective action that actually works to retain students. Nurse educators are urged to be proactive in assessment of student needs and perceptions, prior to or early in the nursing program, and to avoid stereotypes and assumptions about student self-perceptions of persistence, performance, and success (Jeffreys, 2020). Nursing program retention strategies should be holistic by design and approach to reach students with diverse student characteristics, academic needs, and cultural values and beliefs. There is a call for nurse educators to elevate outcomes and performance by going beyond minimal standards, setting the bar high and supporting students to reach it (Jeffreys, 2020). Furthermore, nurse educators have an ethical duty to discover and apply evidence-based approaches to student nurse retention.

The development of retention strategies should include further research to support evidence-based practices, gather more information about why nursing students drop out to help tailor interventions, seek out cost-effective interventions, and analyze the impact of the interventions (Bumby, 2020). Approaches that are inclusive may create an environment that will positively impact academic and psychological outcomes by providing social and professional integration (Jeffreys, 2015, 2022). These types of strategies may include enhanced student services such as orientation, mentoring, tutoring, transitional support, and study groups and can be implemented as enrichment programs.

Jeffreys' Nursing Universal Retention and Success (NURS) Model

Jeffreys' NURS model (2020) provided an organizational framework for the pre-nursing student boot camp under study that fit with the boot camp's overall objective: to create and

implement a holistic strategy for nursing student retention. Jeffreys' NURS model (Jeffreys, 2020) is an empirically-supported, evidence-based model underpinned by the traditional theories of Tinto (1975) and Bean and Metzner (1987) focusing on retention, rather than attrition. The model provides a holistic and proactive approach to retention that is culturally congruent, and discipline-focused. By using this NURS model, nursing educators can identify at-risk students, develop strategies to facilitate their success, and evaluate the effectiveness of those strategies. Jeffreys' NURS model was first developed in 2003 to examine nontraditional nursing student retention and success and has been further developed and applied in retention strategy design, implementation, and evaluation (Jeffreys 2020). The most recent version, shown in Appendix B, gives a big picture view of multiple variables and how they interact with retention decisions, student persistence, and optimal outcomes for both traditional and nontraditional nursing students (Jeffreys, 2022).

Within Jeffreys' NURS model, there are eight sets of variables grouped as "student profile characteristics, student affective factors, academic factors, environmental factors, academic outcomes, psychological outcomes, outside surrounding factors, and professional integration factors" (Jeffreys, 2020, p. 8). The model demonstrates a clear interaction between these variable sets, and emphasizes the need for a holistic, multidimensional, proactive approach to student retention. Professional integration factors are centrally located in the model and interact with each of the other seven variable sets. These integration factors are important in the professional socialization and career development of nursing students as they interact with nurse educators, peers, and clinical partners in the college and community environments (Jeffreys, 2020). Professional integration factors have been shown to be the most powerful influencer over

student potential, articulation, transition, academic progression, and career advancement (Jeffreys, 2022).

The Jeffreys' NURS Model supports specific assumptions about nursing student retention. These assumptions view retention as a priority concern which is dynamic with multiple variables to consider including: (a) having recognition of environmental factors and professional integration as they influence retention, (b) having the benefit of professional socialization; with a focus on success beyond minimal standards to optimize outcomes and performance, and (c) using a holistic approach with inclusiveness (Jeffreys 2020). Furthermore, Jeffreys' NURS model supports a holistic approach to nursing student retention for diverse students, including traditional and nontraditional students, by assessing factors affecting retention and success as well as the creation and implementation of strategies for improvement. A description of the boot camp with student objectives is provided in Appendix C.

Nursing Student Specific Retention Strategies

The review of current literature reveals the need for continued research that focuses on holistic nursing student retention and development of innovative strategies to improve traditional and non-traditional student nurse program completion. Retention strategies developed specifically for nursing student success are needed (Jeffreys, 2020). Many national and international research studies on nursing student retention strategies have been identified in the literature but show varying significant or inconclusive findings (Wray et al., 2017). Nursing student retention strategies not only have the potential to improve nursing program completion rates, but also to impact the supply of nurses ready to enter the workforce, thereby improving the nursing shortage.

There is an ongoing need for individual and collective nurse educator action in identifying student needs to make a positive impact on retaining nursing students (Jeffreys, 2022). Nurse educators may be better able to answer that call by taking a proactive stance and examining student retention challenges guided by the NURS model framework. By exploring and understanding the nursing student specific retention strategies literature, nursing educators may be better equipped to develop and implement retention strategies that are holistic and inclusive.

Nursing Student Retention Strategies for Diverse Student Success

Priority should be given to the creation and implementation of retention strategies that are holistic to reach all students, especially under-represented groups (Jeffreys, 2022). Furthermore, as the nursing workforce becomes increasingly more diverse, priority should be given to efforts aimed at improving academic outcomes for diverse student nurses. Consideration of student profile characteristics may provide nursing educators with greater insight into student needs when creating and implementing nursing student retention strategies.

Student profile characteristics describe beginning nursing students' personal background and identity such as "age, ethnicity, race, and heritage; gender and sexual identity; first language; prior educational experience, family's educational background; prior work experience; and enrollment status" (Jeffreys, 2020, p. 10), which can serve nursing educators in identification of at-risk students. For example, student age, as well as age diversity within nursing programs, is a complex variable that can provide valuable insight into student needs (Jeffreys, 2012). This realization prompts further study of multigenerational groups presenting unique learning needs. Furthermore, student profile characteristics directly affect student academic factors, affective factors, and environmental factors, but have a bidirectional relationship with professional

integration and socialization. Academic, affective, and environmental factors can have either a positive or negative affect on how those characteristics are viewed. Additionally, these variables serve to help identify students as traditional or non-traditional and can also help nurse educators in identifying students who may be at-risk prior to entering nursing programs. Early identification of student characteristics that may affect student success in nursing programs can alert nursing educators and inform retention strategies for success (Jeffreys, 2020).

Identification of traditional and non-traditional students in multigenerational and diverse classrooms may inform nursing student retention strategies. Foley et al. (2012) states that generational cohorts share life events and include similarities in family, ethnic backgrounds, and societal norms. Individuals belonging to a generational cohort are bound by life experiences that impact their societal views. According to Billings and Halstead (2020), the age range of students enrolling in nursing programs may span across three different generational cohorts including Generation X (Gen X), Generation Y/Millennials (Gen Y) and Generation Z (Gen Z). Student perspectives and learning needs vary among generational cohorts, so nursing educators are charged with recognizing generational diversity and creating a positive educational culture to support academic success for all.

Age is a determining factor when classifying a student as traditional or non-traditional, and students who are classified as non-traditional (25 and over) are at greater risk of attrition from nursing programs (Jeffreys, 2012). However, McClanahan (2022) argues that simply categorizing by two age groups does not fully explain differences among the large span of age due to Gen Y/Millennials and Gen X being lumped into the 25 and over non-traditional category. McClanahan posits that educators should consider generational differences in students rather than just the two age groups of 18-24 and 25 and over in community college settings. For

example, the author suggests studying age according to generational cohort, rather than categorizing students in "meta-groups" (p. 8) as either traditional (24 and under) or non-traditional (over 25). Identification of differences between multigenerational cohorts related to student attrition and retention may better inform strategies to retain more nursing students.

The identification of differences between multigenerational cohorts, versus traditional or non-traditional students, related to student attrition and retention may better inform strategies to retain more nursing students. According to the Billings and Halstead (2020), nursing educators should be fair and equal in creating interactive, experiential, group activities to engage students from each generation. Furthermore, students who are engaged may share their diverse perspectives, benefiting not only the other students, but nursing educators as well. Generational diversity awareness may foster student support because nursing educators may be more aware of learning needs and styles as well as identifying those students who may need additional resources such as tutoring and remediation.

A qualitative study conducted by McClanahan (2022) investigated community college faculty experiences with face-to-face multigenerational classrooms. Based on findings from faculty interviews, the researcher suggested that faculty are unconsciously aware of student generational characteristics and that further study is needed on teaching strategies aimed towards multigenerational students. Furthermore, Billings and Halstead (2020) state that implications of knowledge gained by purposeful awareness of generational demographics for nursing educators are significant to the teaching-learning process. Increased nursing educator awareness and sensitivity to generational differences among nursing students may improve nursing retention efforts.

Nursing Student Retention and Pre-Nursing Student Boot Camps

Variations of nursing student boot camps have been held on-campus and online and have been both optional and mandatory for students to attend. Some studies report that optional attendance resulted in poor participation and so in subsequent years, participation became mandatory. Social and academic integration retention strategies such as pre-nursing student boot camps may help create a sense of belonging, facilitate transition from pre-nursing student to nursing student, and aid in development of professional identity (Tinto, 2017). Investigation and discovery of first semester nursing student success related to boot camp participation, with potential findings related to student characteristics, fits within the Jeffreys' NURS model variables. Nurse educators and staff are urged to be proactive when addressing nursing student retention by using inclusive, holistic, caring, and open approaches that provide discipline-focused strategies for success (Jefferys, 2020).

Altman et al. (2010) reported that from 2005 to 2010, a four-week, on campus, freshman orientation was implemented specifically for pre-nursing students as a collaboration between student services and faculty to help with transitioning into the program, enhancing social and professional integration, and improving student outcomes. Students completed a survey consisting of three open-ended questions at the end of the orientation. The authors state that the students' responses have been overwhelmingly positive and that they feel welcomed in their program. Nursing student orientations have also been implemented for online undergraduate students.

Fontaine (2014) reported a positive effect on nursing student retention after an ADN program received grant funding to implement seven retention interventions in a two-day, on campus, comprehensive retention program. This retention program, framed by Jeffreys' NURS model, was designed to target environmental factors and professional integration by helping

students to feel welcome in the environment, understand professional behavior expectations, and build skills for success in the nursing program. The nursing student retention program interventions included a comprehensive orientation, learning communities, an individualized academic plan, community nurse mentoring, counseling, peer tutoring, and career counseling as combined services. Students evaluated the retention program by completing a Likert scale survey about their satisfaction. The research also included analysis of student retention prior to (61% program completion rate) and after the retention program was implemented (71% program completion rate) with a statistically-significant improvement noted ($p = 0.048$). The author reports that the study of this program yielded significant results for improvement in retention, but that it remained unclear which intervention, or combination of interventions could be significantly related to student retention.

Lau and Wang (2014) report that in an attempt to better prepare undergraduate nursing students for the professional role by improving soft skills such as communication and interpersonal relationships with peers, a BSN program implemented a three-day summer camp. The authors describe the camp as an experiential learning opportunity in a safe and fun environment and included sharing sessions with expert clinicians and experiential learning games. The participants (N = 59) took pre- and post-test surveys which indicated statistically significant differences in total communications skills ($p = < 0.0001$), sympathetic consideration ($p = <0.0001$), active listening ($p = 0.001$), and taking initiative in care ($p = 0.009$).

More recently, Kinney et al. (2017) reported a high attrition rate for the ADN nursing program at Northeastern United States community college. Despite receiving as many as 250 completed applications to the program, the college only had space for 40 nursing students each year. Of the 40 students accepted, the authors report that one out of every four students fail out of

the first semester due to either voluntary or involuntary causes, such as personal and family issues, required commitment misconceptions, or lack of dosage calculation and laboratory examination competence. In response to their high attrition rates, the faculty identified areas of student weakness related to student characteristics, academics, outside surrounding factors, professional integration factors, and environmental factors, and created a mandatory orientation program, a one-day boot camp, for beginning nursing students ($N = 27$) which was held four months prior to the first day of the program. The faculty worked with the colleges' student support services center to develop the boot camp and developed three modules. Students ($n = 22$) completed surveys to measure confidence and overall perception of the boot camp. The authors report that 41% ($n = 9.68$) of students perceived an increase in confidence in starting the first semester of the nursing program and 92% ($n = 20.24$) perceived the boot camp as helpful to their success. Overall, the authors report that the evaluation of the boot camp revealed positive student and faculty perceptions which may boost first semester nursing student confidence and improve academic outcomes.

Nursing Student Retention for Motivation, Persistence, and Help-Seeking Behaviors

Student affective factors may impact student achievement, persistence, and retention and include "cultural values and beliefs (CVB), self-efficacy, and motivation" (Jeffreys, 2020, p. 11). CVB reflect student attitudes, values, and beliefs about education, learning, and nursing that may affect the students' ability to be successful. These conscious and unconscious student attitudes and feelings relate to identity and acculturation, but also guide thinking, decisions, and actions (Jeffreys, 2012). The Jeffreys' NURS model (2020) suggests that programs with high levels of cultural congruence within the academic environment may promote success and retention through improvement of academic and psychological outcomes, whereas a lack of cultural

congruence may lead to student stress and dissatisfaction. Nursing educators must be intentionally aware of students' CVB and practice behaviors that promote cultural congruence in nursing education environments which may positively impact student success.

Self-efficacy and motivation may affect or influence nursing student retention and success (Jeffreys, 2012). The NURS model proposes that self-efficacy has been linked with motivation to willingly complete tasks and be persistent, while inefficaciousness is associated with giving up easily, poor motivation, and poor goal commitment. Students who are at either extreme end of the continuum (either inefficacious or overly confident) are at greatest risk of being unsuccessful compared to those in the middle who display confidence as strong, realistic, and resilient individuals. Beginning nursing students may need guidance with self-appraisal and may need special assistance in the development of study skills to meet the requirements of nursing programs, as some may lose motivation or be reluctant to seek help.

Fagan and Coffey (2019) describe a pilot bridge course titled, *Habits of Successful Nursing Students (HSNS),* involving a cohort of undergraduate freshman nursing students (N = 27) in a small New England university which was implemented to explore personal and group-perceived internal and external challenges to persistence as well as resources for success prior to entering the program. Students participated in a one credit, free of charge, course over a two-day period just before the university-wide orientation. Pre-nursing students were engaged in an interactive model for student success that encompassed five habits of success, including, staying inspired, studying smart, managing time, asking for help, and belonging. Fagan and Coffey report that students were either extremely satisfied or satisfied with the course and stated that what they liked most about it was meeting peers and faculty, making friends, gaining insight into the expectations of the program, problem solving with peers, and identifying resources for

success. Further findings indicated that 85% of the students (n = 23) who participated in the course were successful in progressing to the second semester. According to the authors, this finding suggests that incorporation of cognitive, affective, and behavioral factors may better prepare students for the rigors of the nursing program and foster resilience.

Everett (2022) conducted a quantitative exploratory study involving first semester nursing students (N = 31) in an ADN program at a community college in the Midwestern region of the United States. Data was collected using the Help-Seeking Survey tool. By analyzing the data in two stages, first by total sample size and then by grades (A, B, or C grade at the end of the semester), Everett found that students in the lower grade groups (B and C) had more difficulty reaching out for help than those in the A grade group. The author reports that first semester nursing students' (N = 31) reasons for not asking for help included limited time, shyness, embarrassment, perceived non supportive learning environment, lack of knowledge regarding seeking help, weakness, and low self-esteem. Everett suggests that these findings support the need for new models that promote nursing student success, including those that help students to develop self-regulation skills which may help them to ask for help.

Another recent study examined student resilience, specifically related to nursing student characteristics. Based on the results of their study, a cross-sectional quantitative exploration of nursing students with high academic resilience (N = 254) across three South Korean universities, Hwang and Shin (2018) posit that schools of nursing should include curriculum that focuses on improving nursing students' social-affective skills. Based on Jeffreys' (2012) assumption that high levels of resilience are associated with self-efficacy and synchronization, Hwang and Shin found that students with higher levels of academic resilience also had good interpersonal

relationships, high academic grades, a role model, were satisfied with their chosen major, and had higher social-affective capability scores compared to students with lower resilience.

Nursing Student Retention for Academic Progression and Success

The most important academic factors associated with undergraduate nursing student retention such as "personal study skills, study hours, attendance, class schedule, and general academic services" (Jeffreys, 2020, p. 14) are affected by student attitudes and perceptions. Students must expend considerable effort to be responsible managers of their time, and be able to read, write, take notes, study for exams, and listen in class to be successful in achieving academic and psychological outcomes. First semester nursing students may need extra support in developing time-management skills, building endurance, and dealing with the emotional labors associated with nursing.

Alhurishi et al. (2021) state that cognitive, as well as noncognitive predictors of student success in allied health programs should be examined as part of the admission criteria in the prediction of academic potential. In a retrospective analysis of student records ($N = 1634$) they found that the high school grade average ($p = < 0.000$) was the strongest predictor of student achievement. In another study, McKnight and Moore (2022) examined the admission criteria scores of conditionally-admitted undergraduate nursing students ($N = 73$) to identify academic barriers in an effort to predict and promote student success. Through retrospective data analysis of overall science GPA, TEAS science sub score, and limited demographic data (age and gender only), the researchers found no statistically significant correlations between the variables. The researchers recommend annual evaluation of admission criteria as a strategy in providing a holistic admission process, which in turn may help to admit the best qualified applicants capable of achieving academic goals.

One ADN program in the rural Southwestern United States recently implemented a retention strategy aimed at improving first semester and program completion rates. Ingram et al. (2022) explored the implementation of The Exam Analysis (TEA) procedure as a pilot study among first semester nursing students ($N = 50$) using Jeffreys NURS model as an organizing framework. The study was conducted over three semesters, and the researchers found a significant decrease in attrition, with a 90% ($n = 45$) success rate for these students. However, only 50% (n = 26) of those students progressed to the second semester and completed the ADN program. These results are promising for first semester student success related to the use of the TEA for test-taking skills, success, and retention. However, the authors state that the small sample size and setting for this study may not provide generalizability of the findings.

Briscoe and Brown (2019) implemented self-regulated e-learning modules in a rural community college for pre-nursing success, which consisted of five modules guided by the self-regulated learning theory. The researchers report the development of the e-learning modules was a result of faculty efforts to improve student success in their nursing program. The authors posed that student behaviors are influenced by the process of self-monitoring and regulation of cognition, metacognition, and behaviors. According to the researchers, the first two cohorts of pre-nursing students (N=163) had the option to participate in the modules presented by faculty in a two-day seminar format, and student participation was poor ($n = 48$, and $n = 15$, respectively). All students from the first two cohorts completed an online evaluation for the program. For the third cohort ($N = 100$), the faculty revised and condensed the modules, converting them to an e-learning format, based on student feedback from the previous two cohorts. Students in the third cohort were required to present a certificate of completion as a ticket to the first day of class. All students in the third cohort participated in the e-learning modules; however, only 10 of those

completed the online evaluation form so the faculty reported the results as inconclusive. All evaluations from all three cohorts indicated satisfaction with the modules. Although this retention strategy lacks statistically significant information related to student success, it is an excellent example of how nurse educators are being proactive in the search for effective solutions to nursing student retention.

Lewis et al. (2019) found that all attrition is not preventable, but that nursing educators can improve retention by using strategies that promote nursing student development of effective learning and study skills to ensure academic success. The use of assessment forms, such as the GROWTH (Growth, Readiness, Opportunity, Work, Time management, and Habits) form can be used to address affective, psychosocial, and environmental variables. The researchers found that after nurse educators used the GROWTH form during interviews with first-level students in a retention effort, issues such as learning disabilities, parenting insecurities, domestic violence, and homelessness, were discovered that may have been otherwise left unknown. These discoveries led to increased student awareness, caring, and concern among nurse educators and allowed for development of individualized student plans for support and success. Students' perceptions were likewise positive, indicating improvement in ability to self-assess, improved study habits, and increased hope. Additionally, students reported that they felt a closer connection to the nursing educators. The authors suggest that GROWTH form implementation, though not without challenges, has potential for improving student success and retention and should be studied more for its significance and application in relation to identifying student needs.

Nursing Student Retention for Nonacademic Factors

Environmental factors are external to the academic process of undergraduate nursing students and include "financial status, family financial support, family emotional support, family

responsibilities, childcare arrangements, family crisis, employment hours, employment responsibilities, encouragement by outside friends, living arrangements, and transportation" (Jeffreys, 2020, p. 14). These variables may have significant influence on student retention and may be seen as either supportive or restrictive depending on the individual student's perspective. Additionally, recent literature indicates that environmental factors are perceived by students as more influential than academic factors on student retention (Jeffreys, 2012, 2015, 2020; Kruse et al., 2020; Summers, 2020), especially for nontraditional students (Jeffreys, 2007a).

Nonacademic factors may influence retention of undergraduate nursing students (Priode et al., 2020). In a study to identify supportive and restrictive factors that may contribute to non-traditional nursing student persistence (N=59), researchers conducted an explanatory descriptive quantitative study, using the Student Perception Appraisal-Revised (SPA-R) tool (SPA-R mean for this study was 3.0 (>3.0 = most supportive; < 3.0 = most restrictive); Cronbach alpha 0.79) and discovered that nonacademic factors such as family and friends were perceived as most supportive for remaining in their programs. Factors associated as most restrictive were found to be hours of employment, college tutoring services, employment responsibilities, family crisis, and financial status. Based on their findings, the authors recommend retention strategies such as small study groups, tutoring and mentoring, buddy systems for collaboration, learning communities that encourage and support nontraditional student friendships, and socialization in nursing school.

Nursing Student Retention for Improved Academic and Psychological Outcomes

Student retention and success are directly influenced by academic and psychological outcomes involving stress and satisfaction (Jeffreys, 2020). These outcomes are continuously intertwined throughout a student's nursing program experience and dependent on the previously-

discussed Jeffrey's NURS model factors. These interactions serve to influence positive outcomes with may result in persistence and retention. Stress and ineffective coping skills in response to any of the other factors put the student at risk and may result in a negative outcome. Nurse educators are urged to anticipate and mitigate stressors in a proactive manner to facilitate nursing student retention.

Failure of nursing examinations have been found to be a source of stress that may have a negative impact on nursing student persistence and motivation. Fairchild (2022) conducted a study using Jeffreys' NURS model and reported that the nursing student retention rate in a Midwestern United States nursing program was 55% over the past few years and was found to be associated with poor academic performance and outcomes (32% failure rate) in the nursing pharmacology course. The study was a descriptive pretest-posttest-design for identifying at-risk nursing students ($N = 30$) as well as the implementation of an early remediation process as a retention strategy. Students who failed unit exams ($n = 14$) were identified as at-risk. At-risk students were offered participation in a remediation process consisting of 30–60-minute meetings with a faculty remediator prior to each unit exam. This included five remediation processes including review of questions missed on previous exam, instruction for reading test questions, audio-lecture recordings, review of current study habits and exam prep, and instruction for reading the assignments. A statistical significance ($p = <0.0001$) was found for the students who completed the remedial process (n=12) that they were likely to pass subsequent pharmacology exams.

Wennberg-Capellades et al. (2022) report that nursing students struggle with drug calculations, not only due to lack of mathematical skill, but also due to math anxiety. The authors conducted a descriptive retrospective study to gain insight about why undergraduate nursing

students in Spain may have made drug calculation errors. The researchers reviewed dosage calculation exercises ($N = 863$) from student examination papers and found multiple error types and report that their findings are similar to other studies about dosage calculation errors. In another study, Bagnasco et al. (2016) explored mathematical calculation skills in undergraduate nursing students ($N = 726$) in Italy using a descriptive mixed method design and found nursing students lack basic math skills and suggest that mathematic-specific strategies and interventions may improve dosage calculation exam outcomes.

Nursing Student Retention for Professional Integration

It is important for nurse educators to be aware of and understand the process of professional and social integration as a powerful strategy for nursing student retention. Professional integration and socialization of nursing students is also a multidimensional process that has been proven as a major contributing factor in the retention, professional growth, and development of nursing students (Jeffreys, 2012).

According to Jeffreys' NURS model**,** professional integration factors enhance the students' social interaction within the college environment and within the context of professional socialization and career development (Jeffreys, 2020). Professional integration factors, such as nursing educators' advisement and helpfulness, professional organization memberships, participation in professional events, peer support, peer-mentoring and tutoring, and enrichment programs promote socialization as an effective means towards integration of the student into the nursing profession, especially for underrepresented students. Furthermore, emphasis of professional integration factors by incorporating intervention strategies that combine cognitive, affective, and psychomotor domains through coordinated activities, prior to and during the nursing program, may improve nursing student retention.

Morgan et al. (2021) suggest that academic advising models used within undergraduate nursing programs be redesigned to better support academic success and social and emotional adjustment, which may lead to better retention of nursing students. The author explains that in many universities, beginning nursing students are often out of touch with nursing educators and have advisors that follow a traditional model of advisement which can lead to unclear expectations and inconsistent delivery, leaving nurse educators, staff, and students feeling lost. In an undergraduate BSN program in New England, there exists a Tiered A-B-C model of targeted advisement, with assigned expert faculty, to reach all students at the various stages of their nursing education journey. Survey results were reported as overwhelmingly satisfied from both students and faculty and improved student and program outcomes and success.

Byrd and Meling (2020) report similar findings in their investigation of a comprehensive student success center in a Hispanic-serving institution over a five-year period, which was associated with an improvement in NCLEX-RN pass rates, from 78.49% in 2014 to 97.8% in 2018. The success center was developed to provide tailored interventions to diverse nursing students ($N = 543$) in a majority-Latinx (52.5%, $n = 285$) undergraduate nursing program in Texas, but the researchers found that the total population of the program received the benefit of their efforts. In the first year of the success center, retention efforts included an investigation of student transition, new instructional methods with predictive examinations to identify student learning gaps, and the creation of a student success center focused on diverse student learning. Over the next two years, the school implemented an academic enhancement position, explored student responses to an earlier Delphi focus group study (Gonzales, 2009, as cited in Byrd and Meling, 2020) to determine diverse student perceived barriers, and finally, a comprehensive success center was approved and opened. Peer mentoring, academic coaching, undergraduate

research experiences, peer learning, supplemental instruction, and personal tutoring were implemented. Byrd and Meling (2020) conducted a modified Delphi focus group as a replication of the initial study to determine student needs in an effort to address student performance. Findings from the current study indicated a significant improvement in student performance and outcomes and reported a first-time NCLEX-RN pass rate improvement of 19.31% initially and then 9.65% more with the addition of retention and success strategies provided by the comprehensive student success center. Furthermore, even though these strategies were targeted at the underrepresented students, the authors report that the success center had a positive influence on the total population of the program.

Another study explored the use of a pilot study peer advisement course as a means of first-year undergraduate nursing student support and retention in the University of Pittsburg School of Nursing (Kitutu et al., 2021). According to the study, the school of nursing educators identified a gap in nursing educator facilitation of student transition into college based on a student survey, so they developed a taskforce which proposed a peer advisement group from upper classmen to lead 20-30 students each. Undergraduate nursing students ($N = 108$) were paired with peer advisors ($N = 5$) and met weekly. Peer advisors conducted weekly, hour-long meetings with their respective advisees covering topics including campus and academic resources, time management, familial and other relationships, exam prep, college beyond classes, use of technology, wellness/safety/life balance, financial literacy and scholarships, preparing for final exams, and nursing roles. The researchers surveyed nursing students and their peer advisors and found that this strategy was favorable to the first-year nursing students and offered personal and professional growth opportunities among the peer advisors. Challenges that were reported by

the peer advisors included keeping students engaged and not being able to address all student concerns.

One recent qualitative study on student nurse socialization, involved undergraduate nursing students ($N = 7$) and nursing educators ($N = 8$), and sought to highlight professional socialization of nursing students and their nurse educators related to use of language and its influence on students' socialization within the university as well as the clinical setting (Jackson et al., 2021). In this study, the authors report that the definition of professionalism was hard to conceptualize for both students and nurse educators. Findings suggest that adoption of a *Model of Professional Discourse* may improve professional socialization as heard through role modeling communications. Through purposeful use of professional communication in both the clinical and classroom settings as a strategy, year one students may gain more confidence which may improve retention. The authors recommend more research on student confidence and resilience in relation to professional socialization.

Nursing Student Retention for Educational Equity

Outside surrounding factors (OSF) are identified as "world, national, and local events; politics and economics; health care system; nursing professional issues; and job certainty" (Jeffreys, 2020, p. 16) and may be unpredictable and outside of student and/or nurse educator control. OSF can affect student perceptions, motivation, and ability either positively or negatively. Students may need assistance during situations when OSF(s) actually or potentially threaten a student's ability to remain in the nursing program (Jeffreys, 2020). Furthermore, nurse educators must be honest with students in appraising situations and making decisions regarding continuing in the program, stopping out for an indefinite time period, or dropping out altogether.

Williams and Dahan (2022) state that students entering nursing programs, especially underrepresented minority students, have differing levels of educational equity and that some may experience other obstacles that make success more difficult. A *Seminar on Professional Nursing* course was implemented as a retention strategy in a school of nursing in the urban United States which included both undergraduate and graduate nursing students ($N = 161$) from diverse backgrounds. The researchers used Jeffreys' NURS model for early identification of at-risk undergraduate and graduate students in a school of nursing. In their study, based on Jeffreys' NURS models' eight interrelated factors, they conducted a pretest survey using the SPA-R1 instrument and a posttest survey using the SPA-R2 instrument (Cronbach α of 0.82). The researchers found significant correlations (F tests = < 0.5) to student outside surrounding factors including low personal/college support (k = <0.001), financial challenges (k = 0.029), excessive work hours (k= 0.049), and substantial family obligations (k = <0.001) may place students at risk. Based on these findings, the researchers were able to identify additional subsets of students and refer them to the appropriate resources. The researchers state that these findings indicate the importance of early identification and support of all nursing students with retention strategies that ensure successful progression and completion.

Understanding the multidimensional nature regarding the factors that may affect students' progression in nursing programs, as presented according to Jeffreys' NURS model, is an important step in facilitating nursing student success. Retention strategies that begin early in the student's educational journey may help integrate and support students into the culture and profession of nursing. As identified previously in the literature, first semester nursing students have a high risk of attrition due to a single factor or interrelated factors and early intervention strategies have been identified as a possible solution.

Summary

Every year, students numbering in the thousands apply to nursing programs across the world. However, of those that meet requirements and are accepted into nursing programs, as many as half are unsuccessful in completing and attaining a nursing degree. To improve the national nursing shortage and meet healthcare needs of today's society, nursing students must be retained, and their completion rates must improve. Persistence beyond the first semester of the nursing program can occur by creating a sense of belonging (Tinto, 2017). Additionally, a sense of belonging may help them in developing their professional identity. First, they must acclimate and make the transition from college student in prerequisite coursework to college nursing student in the nursing program.

The reviewed literature focuses on how nursing program administrators and nurse educators have worked hard to retain students. However, despite current efforts to graduate more nursing students, attrition and retention of these students continue to be a problem. Nursing student retention is a key performance indicator for accreditation in nursing programs and higher education institutions. More research is needed related to the concept of nursing student retention, owing to the fact that high attrition rates have personal, educational, and professional impacts and may lead to emotional, social, and financial consequences for those involved. Current literature supports the need to recognize and acknowledge at-risk nursing students and to be proactive in the implementation of strategies to improve academic and psychological outcomes. Pre-nursing boot camp retention strategies and their possible contributions may add practical value to the body of knowledge related to improving and sustaining the retention of nursing students.

Jeffreys' NURS model (2020) supports proactive assessment of student needs and perceptions, prior to or early in the nursing program and calls for nurse educators to elevate outcomes and performance by going beyond minimal standards, setting the bar high and supporting students to reach it. Early identification of at-risk students is crucial in closing the gap. Furthermore, a holistic approach to retention using innovative strategies for success can proactively retain nursing students. The proposed study plans to close the gap in the current research and demonstrate improved outcomes (Jeffreys, 2012, 2020).

CHAPTER THREE: METHODS

Overview

The purpose of this non-experimental correlational predictive quantitative study was to investigate the relationship between successful first semester completion and retention to the second semester after boot camp participation in an ADN program at a community college in the rural Southwestern region of the United States. The study sought to investigate to what extent student generational cohort, gender, race, and financial aid status predicted successful first semester completion and retention of nursing students after boot camp participation in the same sample. Chapter three describes the design of the study including the research questions and hypotheses, null hypotheses, participants and setting, instrumentation, data collection methods, and data analysis procedures.

Design

This study sought to investigate a relationship between variables and to predict the outcome of a predictor variable on the criterion variables, so a correlational predictive research design was used. According to Creswell and Guetterman (2019) predictive research designs involve identification of variables that may predict an outcome. A predictive, quantitative research design will involve collecting data on each participant and explaining associations between variables. The authors also state that a retrospective approach allows the researcher to collect and analyze archival student records within the study site.

A retrospective, correlational predictive quantitative study using the chi-square test of independence and a binary logistic regression analysis was the best design to explore the association between retention rates of first semester nursing students and participation in the nursing student boot camp using archival data. This study used correlational statistics to

investigate the relationship between successful completion of the first semester and retention after boot camp participation in an ADN program at a community college during years 2018 through 2022. The variables for research question one were successful completion of the first semester and enrollment in the second semester after boot camp participation. The predictor variables for research question two were student characteristics, including age, categorized by generational cohort, gender, race, and financial aid status, and the criterion variables were the successful completion of the first semester and enrollment in the second semester after boot camp participation. Student characteristic data was collected using an individual student characteristic data collection sheet (Appendix D) to help define the population characteristics and to help answer research question number two. The sample included all nursing students who were enrolled in the ADN program and participated in the boot camp during the fall semesters of 2018-2022. A convenience sampling method was used to collect the archival student data from the Banner database records for all participants.

Research Questions

RQ1: Is there an associative relationship between first semester completion and retention of nursing students to the second semester after boot camp participation in a pre-licensure, undergraduate ADN program at a community college?

RQ2: To what extent does student age, categorized by generational cohort; gender; race; and financial aid status predict successful first semester completion and retention of nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college?

Hypotheses and Null Hypotheses

H1: There is a statistically significant correlation between successful first semester completion and retention of nursing students to the second semester after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

H2: There is a statistically significant predictive correlation between nursing student generational cohort, gender, race, and financial aid status, and successful completion of the first semester and retention after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$1: There is no statistically significant correlation between successful first semester completion and retention of nursing students to the second semester after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$2: There is no statistically significant predictive correlation between student generational cohort and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$3: There is no statistically significant predictive correlation between student generational cohort and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$4: There is no statistically significant predictive correlation between student gender and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$5: There is no statistically significant predictive correlation between student gender and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$6: There is no statistically significant predictive correlation between student race and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$7: There is no statistically significant predictive correlation between student race and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$8: There is no statistically significant predictive correlation between student financial aid status and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$9: There is no statistically significant predictive correlation between student financial aid status and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

Participants and Setting

The target population for this research study was all first semester nursing students enrolled in ADN programs across the Southwestern United States. The participant sample was drawn from first semester nursing students who were enrolled in one undergraduate ADN program in a Southeastern New Mexico community college. The diverse demographic characteristics of the study participant sample are representative of the demographic characteristics of the larger target population. The setting for this study was a rural community college in Southeastern New Mexico. The college is located near the West Texas border and serves Southeastern New Mexico and several counties in rural West Texas.

A convenience sampling method was used for this study. This nonprobability sampling method allows a sample available to the study (Creswell & Guetterman, 2019). Although the

sample is convenient, it may not represent the population regarding critical values (Polit & Beck, 2017). However, according to the proximal similarity model, this sample has characteristics like those of the population of interest, so it may be reasonable to generalize results from this sample (Warner, 2021). Nursing student records that are applicable for the years of interest at the study site were reviewed for inclusion based on the predictor variables: generational cohort, gender, race, and financial aid status; and the criterion variables were successful completion of the first semester and enrollment in the second semester. This sample participant data is of interest for several reasons. Historically, first semester nursing students in this program have the highest attrition rate compared to those in the other three semesters. Students who progress to the second and subsequent semesters are more likely to complete the program successfully.

Each fall, approximately 50 students are accepted into the ADN program under study. Of those accepted to the program, approximately 48 to 55 of them continue to admission to the program. All students accepted into the program at the beginning of fall of 2018 were required to participate in the boot camp. Based on the total number of admissions and participants in the boot camp, the anticipated study sample could include data from up to 250 first semester nursing student participants.

Rigorous research planning including selecting a sample using an a priori power analysis is important in order to avoid type I and II errors and can be accomplished by selecting an appropriate alpha (α) level, power dependent on beta (β), and effect size (Peterson & Foley, 2021). Additionally, a Bonferroni adjustment is performed when multiple comparisons and analyses are to be conducted for statistical significance (Warner, 2021). This calculation produces a per comparison alpha (PC_α) level and further decrease the chance of type I errors. The study plans to examine multiple comparisons and analyses of the variables, so according to the

Bonferroni calculation, the alpha level was adjusted to have a PC_{α} of 0.005 for sample size calculation. An a priori power analysis for logistic regression was used to calculate the sample size where per comparison alpha (PCα) = 0.005, beta (β) = 0.80 (desired power), and medium effect size odds ratio (OR) = 3.5. The planned sample size was calculated using the test family: z tests; statistical test: logistic regression: R^2 other $X = 0$, X distribution = binomial, X parm π = 0.5, two tailed, where alpha (α) = 0.005, beta (β) = 0.80 (desired power), and medium effect size OR= 3.5, and number of predictors = 4. The a priori analysis determined that the total sample size should be at least $N = 149$ (Appendix E) (G*Power Version 3.1.9.7, 2020). For this study, the total number of participant data sampled was $N = 227$ exceeding the required minimum sample for a medium effect size.

Research question one had two variables: successful completion of the first semester and retention to the second semester in the ADN program after boot camp participation. The second research question had four predictor variables: age, categorized by generational cohort; gender; race; and financial aid status; and two criterion variables: successful completion of the first semester and retention to the second semester in the ADN program. Student characteristic variables, including student age, categorized by generational cohort, gender, race, and financial aid status, were explored to discover predictive correlations with the successful completion of the nursing program after boot camp participation and retention in the ADN program. These variables fit within the student characteristics described by Jeffreys' NURS model (2020).

Student characteristics are variables that may affect nursing student retention (Jeffreys, 2012). Furthermore, these variables may serve to help identify students as traditional or non-traditional and may help nurse educators in identifying students who may be at-risk prior to entering nursing programs. This early identification can alert nursing educators and inform

retention strategies for success. Student characteristic data was collected using the individual student characteristic data collection sheet (Appendix D). Descriptive analysis is included in the findings. Participant individual student characteristic data and coded student characteristics data are found in Appendix F.

Instrumentation

Archival demographic data and enrollment records for the first semester nursing courses were sought for this research study to measure the relationship between successful first semester completion and retention to the second semester after boot camp participation and to explore predictions of student success and retention according to generational cohort, gender, race, and financial aid status. No participants were recruited for this study. Following Institutional Review Board (IRB) and official study site approval (Appendix G), the researcher met with the Vice President for Institutional Research, Planning, and Effectiveness at the community college study site to create a plan for access to archival nursing student boot camp participation and progression records, demographic data, financial aid status, and enrollment status data. All data was electronically received and kept confidential on a password protected computer that only the researcher has access to. Data collection included archival data from the study site's comprehensive student information system (Banner database) and the nursing program's boot camp participation and student progression records for years 2018-2022. Data was stripped of all student identifiers prior to obtaining it for analysis and complied using the individual student characteristic data collection sheet (Appendix D).

Procedures

This research study was conducted through collection and analysis of archival data. A systematic approach guided the procedures for this study as described below.

1. IRB approval was obtained through Liberty University (Appendix G).
2. The Liberty IRB approval letter was provided to the Vice President for Institutional Research, Planning, and Effectiveness at the community college study site.
3. A written approval letter was obtained from the community college study site (Appendix G).
4. A meeting was held with the Vice President for Institutional Research, Planning, and Effectiveness at the community college study site to create a plan for access to stripped archival nursing student boot camp and progression records, demographic data, financial aid data, and enrollment status data.
5. The stripped data was received electronically from the Vice President for Institutional Research, Planning, and Effectiveness at the community college study site and nursing program director via confidential email. All information was kept confidential on a password protected computer that only the researcher has access to.
6. The preliminary nursing student boot camp and progression data, demographic data, financial aid, and enrollment status data were coded according to the student characteristics data collection sheet (Appendix D).
7. The coded preliminary nursing student boot camp and progression data, demographic data, financial aid, and enrollment status data were organized by year and according to participation in the boot camp and enrollment in the second semester of nursing program in an Excel spreadsheet.
8. The data was organized into an Excel spreadsheet codebook listing all variables with corresponding codes to help with consistency and reference throughout the analysis process.

9. The data was uploaded into the Statistical Package for Social Sciences (SPSS) version 28.
10. All preliminary data was screened in SPSS using appropriate statistical tests according to the assumptions for the chi-square test of independence for research question one and binary logistic regression for research question two.
11. The data was reviewed for outliers and incomplete demographic data. There were no extreme outliers.
12. The data was analyzed, interpreted, and reported.

Data Analysis

After the data was prepared and organized according to the procedures outlined above, it was analyzed using the Statistical Package for Social Sciences (SPSS) version 28 to answer the research questions and test the hypotheses (Creswell & Guetterman, 2019). This study used descriptive statistics to describe the sample. The significance level for this study was 0.05 (α), two-tailed, with a medium effect size, and a power of 0.80 (β). The initial data analysis plan was to conduct multiple linear regression; however, once the data was accessed, there was a need to move to a chi-square test of independence for research question one and binary logistic regression for research question two. Additionally, the first research question could not be answered using prediction, so the first research question was revised to an associative correlational question. An overview of the statistical analysis changes and the revised research question, along with the original research questions and hypotheses are found in Appendix H.

Descriptive statistics were used to define the sample average including the median, mean, and/or mode for student generational cohort, gender, race, and financial aid status. This information is important to consider when describing central tendency and variation of cases (Warner, 2021). Preliminary data screening was done by examining the frequency distribution

tables and graphs to evaluate the mean, median, and/or mode(s) to determine the best way to describe central tendency. The standard normal distribution was evaluated to detect outliers and to evaluate whether the data met the assumptions for further statistical analysis. There were no extreme outliers. Standard deviation (*SD*), score frequency distribution tables, and descriptive summaries are included in the results.

The chi-square test of independence is used to test whether there is an association between two nominal variables by comparing frequencies and providing the overall difference between the expected and observed frequencies (Laerd Statistics, 2023). A statistically significant result is likely when the observed frequencies and expected frequencies are far apart, or independent. There are four assumptions that must be met to run a chi-square test of independence:

1. The first assumption requires that there are two nominal variables.
2. Assumption two required independence of observations, meaning that there is no relationship in or between the observations in each group.
3. Assumption three requires cross-sectional or naturalistic sampling.
4. Assumption four requires that all cells have expected counts greater than or equal to five.

After the assumptions for the chi-square test of independence were met, the researcher evaluated the crosstabs for adequate sample size and observed and expected frequencies for each cell of the design. Once these procedures were completed in SPSS, the results of the chi-square test of independence were analyzed, interpreted, and reported.

Binary logistic regression "attempts to predict the probability that an observation falls into one of two categories of a dichotomous dependent variable based on one or more independent variables that are either continuous or categorical" (Laerd Statistics, 2023, para 1).

Furthermore, binary logistic regression allows the researcher to determine the overall fit of the model, and observations are assigned to categories which are most likely to be predicted. There are seven assumptions that must be met for binary logistic regression analysis:

1. The first assumption requires that there is one dichotomous dependent (criterion) variable, such as nominal with two outcomes (“yes” or “no”).
2. Assumption two requires that there are one or more independent (predictor) variables measured as either continuous or nominal. The first two assumptions have been met for binary logistic regression analysis of the study. The second hypothesis had four independent nominal variables, and two nominal dependent variables.
3. Assumption three requires independence of observations and that the dichotomous dependent variable categories and nominal independent variables are mutually exclusive and exhaustive.
4. Assumption four requires a minimum of 15 cases per independent variable.
5. Assumption five requires that there be a linear relationship between continuous independent variables and the logit transformation of dependent variables by performing the Box-Tidwell approach. However, if all of the independent variables are categorical (nominal or ordinal) this assumption does not need to be tested (Laerd Statistics, 2023).
6. Assumption six requires that the data does not show multicollinearity.
7. Assumption seven requires that there are no significant outliers, high leverage points, or highly influential points.

Binary logistic regression analysis was used to predict correlations of student generational cohort, gender, race, and financial aid status with successful completion of the first semester and retention to the second semester in the ADN program after boot camp participation.

Preliminary data screening was based on the seven assumptions of binary logistic regression analysis and included (a) data coding to inspect variables and data for missing cases and making sure categories did not have very low counts, (b) non-parametric examination of variable correlations, (c) detecting for multicollinearity through inspecting correlation coefficients and tolerance/VIF values, (c) detection of outliers using casewise list diagnostics and studentized deleted residuals, (d) determining model fit using the Hosmer and Lemeshow goodness of fit test and consulting the Cox & Snell R^2 and Nagelkerke R^2 values to understand variation among dependent variables that could be explained by the model, (e) examining the estimated category probability prediction (greater than or equal to 0.5 or less than 0.5) of whether the cases can be correctly classified from the independent variables, and (f) assessing the contribution of each independent variable to the model and its statistical significance (Wald test) using the variables in the equation table to assess the *p* value for statistical significance, the odds ratio (OR) for effect size, and the confidence interval (CI) of each independent variable (Laerd Statistics, 2023).

After the assumptions for binary logistic regression were met, the researcher determined that the model was a good fit for the data (Laerd Statistics, 2023). This was done by examining the omnibus tests of model coefficients and the Hosmer and Lemeshow goodness of fit test for the overall statistical significance of the model, the percentage of variance explained by examining the Cox & Snell $R^2$and Nagelkerke R^2values, and the precision of the observed and predicted classifications by examining the classification table output from SPSS for the regression model. Once the overall model fit was determined, the OR, CI, and statistical significance of the regression model were interpreted and reported.

Summary

The study aimed to explore the relationship between successful completion of the first semester and retention to the second semester after boot camp participation in an ADN program at a community college in the rural Southwestern region of the United States. Additionally, the study sought to discover predictive correlations between student age, categorized by generational cohort, gender, race, and financial aid status with successful completion of the first semester and retention in an ADN program after participation in a pre-nursing boot camp in the same sample.

The study design was quantitative correlational predictive, using a retrospective approach to data collection. Archival data was collected from the community college study site's comprehensive student information system (Banner database). Student characteristic data was collected from existing records using the individual student characteristic data collection sheet (Appendix D). The sample size for this study included $N = 227$ participants for a medium effect size using a convenience sampling method. The sample included all nursing students who participated in the pre-nursing boot camp from 2018-2022. Descriptive statistics were used to describe the sample characteristics. A chi-square test of independence was conducted for hypothesis one, and binary logistic regression analysis was conducted for hypothesis two in SPSS version 28. Statistical findings are presented in tables with descriptive summaries in Chapter Four.

CHAPTER FOUR: FINDINGS

Overview

The purpose of this non-experimental correlational predictive quantitative study was to investigate the relationship between successful first semester completion and retention to the second semester after boot camp participation in an ADN program at a community college in the rural Southwestern region of the United States. The study sought to discover predictive correlations to student age, categorized by generational cohort; gender; race; and financial aid status with successful first semester completion and retention of nursing students after boot camp participation in the same sample. A chi-square test of independence was conducted to test the first null hypothesis. Crosstabulations and binary logistic regression were conducted to test null hypotheses two through nine. Chapter Four includes the research questions, hypotheses, descriptive statistics, and analysis of the results for this predictive correlational study.

Research Questions

RQ1: Is there an associative relationship between first semester completion and retention of nursing students to the second semester after boot camp participation in a pre-licensure, undergraduate ADN program at a community college?

RQ2: To what extent does student age, categorized by generational cohort, gender, race, and financial aid status predict successful first semester completion and retention of nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college?

Hypotheses and Null Hypotheses

H1: There is a statistically significant correlation between successful first semester completion and retention of nursing students to the second semester after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

H2: There is a statistically significant predictive correlation between nursing student generational cohort, gender, race, and financial aid status, and successful completion of the first semester and retention after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$1: There is no statistically significant correlation between successful first semester completion and retention of nursing students to the second semester after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$2: There is no statistically significant predictive correlation between student generational cohort and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$3: There is no statistically significant predictive correlation between student generational cohort and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$4: There is no statistically significant predictive correlation between student gender and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$5: There is no statistically significant predictive correlation between student gender and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$6: There is no statistically significant predictive correlation between student race and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$7: There is no statistically significant predictive correlation between student race and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$8: There is no statistically significant predictive correlation between student financial aid status and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$9: There is no statistically significant predictive correlation between student financial aid status and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

Descriptive Statistics

Archival data was collected from the study site's database system (Banner database). First semester nursing student data was accessed to gather the data for pre-nursing student participation in a one-day pre-nursing boot camp and subsequent first semester completion and retention to the second semester of the ADN program across a five-year period. The combined total sample size included all nursing students enrolled in the first semesters of 2018, 2019, 2020, 2021, and 2022 and participated in a one-day pre-nursing boot camp was 227.

Descriptive Statistics of Total Sample

The total sample size was $N = 227$. The mean and standard deviation for each independent and dependent variable are displayed in Table 1.

Table 1

Descriptive Statistics

	N	Mean	Std. Deviation
Participated in Boot Camp	227	1.00	.000
Successfully Completed First Semester	227	.70	.459
Retained to Second Semester	227	.70	.459
Generational Cohort	227	2.50	.583
Gender	227	.11	.314
Race	227	1.53	.805
Financial Aid Status	227	.52	.501
Valid N (listwise)	227		

Table 2 provides a summary of the total sample demographic characteristic categories. The most frequently-observed category of gender was female (n = 202, 89%). The most frequently-observed category of race was Hispanic (n = 139, 61.2%). The most frequently-observed category of generational cohort was Gen Z (n = 123, 54.2%). The most frequently-observed category of financial aid status was Yes (n = 117, 51.5%).

Table 2

Demographic Characteristics of Participant Categories (N = 227)

Characteristic	*n*	*%*
Gender		
Female	202	89
Male	25	11
Total	227	100
Race		
American Indian	2	0.9
Asian	3	1.3
Black or African American	9	4
Hispanic	139	61.2
White	67	29.5
Other	1	0.4
Not Specified	5	2.2
Two or More Races	1	0.4
Total	227	100
Generational Cohort		
Gen X	10	4.4
Gen Y	94	41.4
Gen Z	123	54.2
Total	227	0.00
Financial Aid Status		
Yes	117	51.5
No	110	48.5
Total	227	100

Data Screening and Coding

Prior to conducting the data analysis, the data were screened for missing data and data inconsistencies using the sort function in SPSS version 28 software. Data screening was conducted on the predictor variables (boot camp participation, generational cohort, gender, and financial aid status) and the criterion variables (first semester completion and retention to the second semester).

For research question one, assessment of the variables was conducted to determine boot camp participation, nursing student successful first semester completion, and retention to the second semester of the nursing program. Each recoded student identification number (ID) (N = 227) was listed in an Excel spreadsheet along the y-axis with each variable listed across the x-axis. The variables included boot camp participation, successful first semester completion, and retention to the second semester in the program for the fall semesters of 2018 through 2022. Frequencies for research question one were determined by coding boot camp participation as "1" = Yes or "0" = No; successful first semester completion as "1" = Yes or "0" = No; and retention to the second semester in the program as "1" = Yes or "0" = No.

For the second research study question, additional variable frequencies were assessed including predictor variables of generational cohort, gender, race (Black or African American, Hispanic or Latino, White or Caucasian, American Indian or Native American, Asian or Native Hawaiian or Pacific Islander), and financial aid status; and the criterion variables of successful first semester completion and retention to the second semester in the nursing program (each coded "1" = Yes; or "0" = No). The Excel sum function was used to calculate frequencies of each predictor and criterion variable.

The criterion variables were measured as binomial distribution with two possible outcomes, coded by "1" or "0". In the current study, the criterion variables coded as nominal by "1" were successful completion of the first semester of the program, and retention to the second semester in the nursing program after boot camp participation and unsuccessful completion of the first semester of the program or no retention to the second semester after boot camp participation was coded by "0". Predictor variables included generational cohort, gender, race, and financial aid status. Gender was coded as nominal by "1" = Male or "0" = Female. Race was

a nominal categorical variable with more than two categories (American Indian or Native Alaskan, Asian or Native Hawaiian or Pacific Islander, Black or African American, Hispanic or Latino, White or Caucasian, or Other), so it was necessary to code each category using four dummy binary variables (Warner, 2018) including African American, Hispanic, White, or Other race or not specified, where "1" = a member of a specified racial group or "0" = not a member of a specified racial group for binary logistic regression analysis. Generational cohort was coded as ordinal variables where "1" = Gen X, "2" = Gen Y, or "3" = Gen Z. Financial aid status was coded as nominal by "1" = Yes; or "0" = No.

Table 3 shows that all the variables collected in this study consisted of binary nominal categories (coded by "0" or "1") or ordinal categories (coded by "1", "2", or "3") and gives the category, level, and function for each variable.

Table 3

Definitions of Coded Categorical Variables

Variable	Code	Category	Level	Function
First semester completion				
	1	Yes	Binary	DV
	0	No		
Retention to second semester				
	1	Yes	Binary	DV
	0	No		
Gender	1	Male	Binary	IV
	0	Female		
Generation cohort				
	1	X	Ordinal	IV
	2	Y		
	3	Z		
Race/ethnicity				
African American	1	Yes	Binary	IV
	0	No		
Hispanic	1	Yes	Binary	IV
	0	No		
White	1	Yes	Binary	IV
	0	No		
Other	1	Yes	Binary	IV
	0	No		
Financial aid status	1	Yes	Binary	IV
	0	No		

Note: DV = Dependent or criterion variable; IV = Independent variable

Table 4 depicts the categorical characteristics of the boot camp participant study sample. A majority of the 227 participants who attended the boot camp (n = 159, 70%) successfully completed the first semester of the ADN program, and exactly the same participants were also retained to the second semester of the program (n = 159, 70%). The sizes of the generational cohorts increased from the lowest frequency in Generation X (n =10, 4.4%) through Generation Y (n = 94, 41.4%) to the largest frequency in Generation Z (n = 123, 54.2%). Hispanic was the most frequent racial group (n = 139, 61.2%) followed by White (n = 67, 29.5%) and

Black/African American (*n* = 9, 1, 4%). The fourth category classified as "Other" (*n* = 7, 3.1%) included a mixture of minority racial groups, defined as Asian (*n* = 3, 1.3%); American Indian (*n* = 2, 0.9%). "Not specified" (n = 6, 2.8%) and "Two or More Races" (*n* = 1, 0.4%). The participants were divided approximately equally into those with financial aid status (*n* = 117, 51.5%) and those without financial aid (*n* = 110, 48.5%).

Table 4

Categorical Characteristics of Boot Camp Participants (N = 227)

Variable	Code	Category	*n*	%
First semester completion				
	0	No	68	30.0
	1	Yes	159	70.0
Retained to second semester				
	0	No	68	30.0
	1	Yes	159	70.0
Gender	0	No	202	89.0
	1	Yes	25	11.0
Generational cohort				
	1	Gen X	10	4.4
	2	Gen Y	94	41.4
	3	Gen Z	123	54.2
Race/Ethnicity				
African American	0	No	218	96.0
	1	Yes	9	4.0
Hispanic	0	No	88	38.8
	1	Yes	139	61.2
White	0	No	160	70.5
	1	Yes	67	29.5
Other	0	No	220	96.9
	1	Yes	7	3.1
Financial aid status	0	No	110	48.5
	1	Yes	117	51.5

Table 5 depicts the frequencies of participants for boot camp participation, successful first semester completion, and retention to the second semester in the ADN program for each fall semester included in the study. Students are only admitted one time per year in this program, in the fall semester. All students enrolled in the fall semesters of 2018-2022 participated in the boot camp, so the most frequently-observed category of boot camp participation was Yes ($N = 227$, 100%). Of the total sample ($N = 227$), the same number of participants who successfully completed the first semester ($n = 159$, 70%) were also retained in the second semester of the program ($n = 159$, 70%).

Table 5

Frequency Table for Boot Camp Participation, First Semester Completion and Retention to Second Semester by Semester

Variable	Semester					
	Fall 2018 Cohort	Fall 2019 Cohort	Fall 2020 Cohort	Fall 2021 Cohort	Fall 2022 Cohort	Totals
Boot Camp Participation						
Total	47	55	47	32	46	227
Successful First Semester Completion						
Total	37	41	25	24	32	159
Retained to Second Semester						
Total	37	41	25	24	32	159

Results

The results of this study follow are organized by the hypotheses. A chi-square test of independence was conducted to test the first null hypothesis. Crosstabulations and binary logistic regression were conducted to test null hypotheses two through nine. Each test is described with corresponding tables depicting the binary regression results. Crosstabulation tables are found in Appendix I.

Hypothesis One

H1: There is a statistically significant correlation between successful first semester completion and retention of nursing students to the second semester after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

Hypothesis One Results

The data was screened considering the assumptions of the chi-square test of independence. Data consisted of only nominal variables, and the independence of observations between variables was met. The assumption of adequate cell size was assessed, which requires all cells to have expected values greater than zero and 80% of cells to have expected values of at least five (Warner, 2021). All expected cell frequencies were greater than five, indicating the second condition was met. After data screening was conducted and assumptions were met, a chi-square test of independence was conducted between nursing students' successful first semester completion and retention to the second semester of the ADN program after boot camp participation.

$H_0$1: *There is no statistically significant correlation between first semester completion and retention of nursing students to the second semester after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.*

The chi-square test of independence indicated that there was a statistically significant association between successful first semester completion and retention to the second semester after boot camp participation, $\chi^2(1, 226)$, $p < .001$. The association was strong (Cohen, 1988). Cramer's V = 1.0. Tables 6 and 7 present the results of the chi-square test of independence. The researcher failed to reject the null hypothesis and can state that there is a statistically significant correlation as noted below.

Table 6

Chi-square Test of Independence Observed and Expected Frequencies

Successful first semester completion	Retention to the second semester				
	Yes	No	χ^2	*df*	*p*
Yes	159[111.37]	0[47.63]	227.00	1	< .001
No	0[47.63]	68[20.37]			

Note. Values formatted as Observed [Expected].

Table 7

Chi-square Test of Independence Symmetric Measures

Participated in Boot camp			Value	Approximate Significance
Yes	Nominal by Nominal	Phi	1.000	<.001
		Cramer's V	1.000	<.001
	N of Valid Cases		227	
Total	Nominal by Nominal	Phi	1.000	<.001
		Cramer's V	1.000	<.001
	N of Valid Cases		227	

Hypothesis Two

H2: There is a statistically significant predictive correlation between nursing student's generational cohort, gender, race, and financial aid status, and successful completion of the first

semester and retention after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

Hypothesis Two Results

The data was screened considering assumptions for binary logistic regression. The criterion variables were dichotomous nominal variables, and the predictor variables were all nominal or ordinal. Since independent variables are nominal, the test for linearity was not necessary and was not performed (Laerd Statistics, 2023). There were 227 cases per independent variable, no paired data, there were no extreme outliers, and the independent variables were not highly correlated. Table 8 presents the non-parametric examination of variable correlations.

Table 8

Non-parametric Examination of Variable Correlations

			Gender	Race	Generational Cohort	Financial Aid Status
Spearman's rho	Gender	Correlation Coefficient	1.000	.028	.093	-.053
		Sig. (2-tailed)	.	.672	.163	.426
		N	227	227	227	227
	Race	Correlation Coefficient	.028	1.000	-.182**	-.035
		Sig. (2-tailed)	.672	.	.006	.595
		N	227	227	227	227
	Generational Cohort	Correlation Coefficient	.093	-.182**	1.000	-.097
		Sig. (2-tailed)	.163	.006	.	.144
		N	227	227	227	227
	Financial Aid Status	Correlation Coefficient	-.053	-.035	-.097	1.000
		Sig. (2-tailed)	.426	.595	.144	.
		N	227	227	227	227

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

The assumption of absence of multicollinearity was examined. Variance Inflation Factors (VIFs) were calculated to detect the presence of multicollinearity between predictors. High VIFs

indicate increased effects of multicollinearity in the model. VIFs greater than five are cause for concern, whereas VIFs of 10 should be considered the maximum upper limit (Warner, 2021). All predictors in the regression model have VIFs of less than five. Table 9 presents the VIF for each predictor in the model.

Table 9

Variance Inflation Factors for Gender, Race, Generational Cohort, and Financial Aid Status

Variable	VIF
Gender	1.03
Race	1.27
Generational Cohort	1.28
Financial Aid Status	1.03

After data screening was conducted and assumptions were met, the binary logistic regression analysis was conducted at the 95% confidence level (CI) to determine the likelihood that the independent variables were predictors for successful first semester completion and retention to the second semester in the program after boot camp participation for research question two. A binary logistic regression was performed to ascertain the effects of generational cohort, gender, race, and financial aid status on the likelihood that participants would successfully complete the first semester and be retained in the second semester in an ADN program after boot camp participation.

The model was evaluated based on an actual alpha level of .05 ($p = .05$). The overall model was statistically significant, $\chi^2(7) = 15.732$, $p = .028$ (Table 12), suggesting that gender, race, generational cohort, and financial aid status had a significant effect on the odds of observing the "Yes" category of successful first semester completion and retention to the second semester of the ADN program. Nagelkerke R^2 was calculated to examine the model fit, where

values closer to 1 are indicative of models with excellent fit (Pampel, 2022). The Nagelkerke R^2 value calculated for this model was 0.095 meaning the model explained 9.5% of the variance in successful first semester completion and retention to the second semester and correctly classified 71.8% of cases. Sensitivity was 96.2%, specificity was 14.7%, positive predictive value was 72.5% and negative predictive value was 62.5%. Of the four predictor variables only two were statistically significant: generational cohort and race (Hispanic and White races only). Table 10 presents the Omnibus Tests of Model Coefficients, and the Model Summary is presented in Table 11.

Table 10

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	15.732	7	.028
	Block	15.732	7	.028
	Model	15.732	7	.028

Table 11

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	261.431[a]	.067	.095

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Additionally, the Odds Ratio (OR) was the effect size output by SPSS in the model to interpret the results of binary logistic regression. The OR for each independent variable indicated how much the strength of the association between the binary coded events that constituted the dependent variable varied with respect to the values of the independent variable (Pampel, 2022). Effect sizes in social sciences are often reported as very small but another source argues that an

agreement on the magnitude of the effect establishing practical significance has proven difficult and should be context-specific (Ferguson, 2016). Considering the context of this study, the OR was evaluated as the effect size measure comparing relative risk for achieving or not achieving the outcomes (successful first semester completion and retention to the second semester in the ADN program) versus Cramer's V (Verzino, 2021) among students who participated in the boot camp as part of the binary regression model. Cross-tabulations of frequencies were also conducted for independent and dependent variables in research question two and are available in Appendix I.

Table 12 presents the output of the binary logistic regression analysis conducted to address hypothesis two. Race was collapsed into a dummy variable with three categories, each coded by "0" or "1". SPSS automatically excluded the fourth category 'Other' because the maximum number of categories in a dummy variable in a regression analysis is limited to k-1 where k is the total number of categories in the variable (Statology, 2021).

Table 12

Binary Logistic Regression Model to Predict Successful First Semester Completion and Retention to Second Semester After Boot Camp Participation

Independent variable	Regression Coefficient	Wald	df	*p*	OR	95% CI	
						Lower	Upper
Generational Cohort							
Gen X, GenY, or Gen Z	-0.59	4.21	1	0.040	0.55	0.32	0.97
Gender							
Male or Female	-0.38	0.56	1	0.456	0.68	0.25	1.86
Hispanic	1.72	6.72	1	0.010	5.57	1.52	20.38
White	2.14	9.28	1	0.002	8.51	2.15	33.78
Black/African American	0.53	0.32	1	0.572	1.71	0.27	10.92
Financial Aid Status	-0.18	0.36	1	0.546	0.83	0.46	1.51

$H_0$2: *There is no statistically significant predictive correlation between student generational cohort and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.*

Table 13 presents the binary logistic regression model prediction that when the generational cohort changes from X to Y, or from Y to Z then the likelihood of successful first semester completion in the ADN program decreases by OR = 0.55, p = .040, with 95% CI (0.32, 0.97) not capturing 1.0. The researcher rejected the null hypotheses at $\chi^2(1) = 4.21$, p = .040 and can state that there is a statistically significant predictive correlation between student generational cohort and successful completion of the first semester among nursing students after boot camp participation. However, the effect of generational cohort is small at OR = 0.55.

Table 13

Generational Cohort and Successful Completion of the First Semester

Independent variable	Regression Coefficient	Wald	df	*p*	OR	95% CI	
						Lower	Upper
Generational Cohort							
Gen X, GenY, or Gen Z	-0.59	4.21	1	0.040	0.55	0.32	0.97

$H_0$3: *There is no statistically significant predictive correlation between student generational cohort and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.*

Table 14 presents the binary logistic regression model prediction that when the generational cohort changes from X to Y, or from Y to Z then the likelihood of second semester retention in the ADN program decreases by OR = 0.55, p = .040, with 95% CI (0.32, 0.97) not capturing 1.0. The researcher rejected the null hypotheses at $\chi^2(1) = 4.21$, p = .040, and can state that student generational cohort statistically significantly predicted retention of nursing students

to the second semester after boot camp participation. However, the effect of generational cohort is small at OR = 0.55.

Table 14

Generational Cohort and Retention to Second Semester After Boot Camp Participation

Independent variable	Regression Coefficient	Wald	df	*p*	OR	95% CI	
						Lower	Upper
Generational Cohort							
Gen X, GenY, or Gen Z	-0.59	4.21	1	0.040	0.55	0.32	0.97

$H_0$4: *There is no statistically significant predictive correlation between student gender and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.*

Table 15 present the binary regression model prediction that when gender is male then the likelihood of successful first semester completion is OR = .68, $p = 0.456$ relative to female with 95% CI (0.25, 1.86) capturing 1.0. The effect of gender is very small and is not practically significant at OR = .68. The researcher failed to reject the null hypothesis at $\chi^2(1) = 0.56$, $p = .456$ and can state that gender does not statistically significantly predict successful completion of the first semester among nursing students after boot camp participation.

Table 15

Gender and Successful First Semester Completion After Boot Camp Participation

Independent variable	Regression Coefficient	Wald	df	*p*	OR	95% CI	
						Lower	Upper
Gender							
Male or Female	-0.38	0.56	1	0.456	0.68	0.25	1.86

$H_0$5: *There is no statistically significant predictive correlation between student gender and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.*

Table 16 presents the binary regression model prediction that when gender is male then the likelihood of retention to the semester completion is OR = .68, $p = 0.456$ relative to female with 95% CI (0.25, 1.86) capturing 1.0. The effect of gender is very small and is not practically significant at OR = .68. The researcher failed to reject the null hypothesis at $\chi^2(1) = 0.56$, $p = .456$, and can state that gender does not statistically significantly predict retention to the second semester among nursing students after boot camp participation.

Table 16

Gender and Retention to Second Semester After Boot Camp Participation

Independent variable	Regression Coefficient	Wald	df	*p*	OR	95% CI	
						Lower	Upper
Gender							
Male or Female	-0.38	0.56	1	0.456	0.68	0.25	1.86

$H_0$6: *There is no statistically significant predictive correlation between student race and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.*

Table 17 presents the binary regression model prediction that when race is Hispanic, then the likelihood of first semester completion in the ADN program relative to not Hispanic is OR = 5.57, $p = .010$; with 95% CI (1.52, 20.38) not capturing 1.0. When race is White, then the likelihood of first semester completion in the ADN program is OR = 8.51, $p = .002$, relative to not White with 95% CI (2.15, 33.78) not capturing 1.0. When race is Black/African American, then the likelihood of first semester completion is OR = 1.72, $p = .572$, relative to not Black/African American with 95% CI (0.27, 10.92) capturing 1.0. The effect of Hispanic race is practically significant, and OR > 4 represents a "strong effect" (Ferguson, 2016, p. 305). The effect of White race is practically significant, and OR > 4 also represents a "strong effect" (Ferguson, 2016, p. 305). The effect of Black/African race is very small and not practically

significant at OR = 1.71. Black/African American race, at $\chi^2(1) = 0.32$, $p = .572$, did not statistically significantly predict successful completion of the first semester among nursing students after boot camp participation. However, race as a category did provide some significant results. The researcher rejected the null hypothesis at $\chi^2(1) = 6.72$, $p = .010$ for Hispanic race, and $\chi^2(1) = 9.28$, $p = .002$ for White race, and can state that Hispanic and White race statistically significantly predicted successful completion of the first semester among nursing students after boot camp participation.

Table 17

Race and Successful First Semester Completion After Boot Camp Participation

Independent variable	Regression Coefficient	Wald	df	*p*	OR	95% CI	
						Lower	Upper
Hispanic	1.72	6.72	1	0.010	5.57	1.52	20.38
White	2.14	9.28	1	0.002	8.51	2.15	33.78
Black/African American	0.53	0.32	1	0.572	1.71	0.27	10.92

$H_0$7*: There is no statistically significant predictive correlation between student race and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.*

Table 18 presents the binary regression model prediction that when race is Hispanic then the likelihood of retention to the second semester in the ADN program relative to not Hispanic is OR = 5.57, $p = .010$; with 95% CI (1.52, 20.38) not capturing 1.0. When race is White then the likelihood of second semester retention in the ADN program is OR = 8.51, $p = .002$, relative to not White with 95% CI (2.15, 33.78) not capturing 1.0. When race is Black/African American, then the likelihood of retention to the second semester is OR = 1.72, $p = .572$, relative to not Black/African American with 95% CI (0.27, 10.92) capturing 1.0. The effect of Hispanic race is

practically significant, and OR > 4 represents a "strong effect" (Ferguson, 2016, p. 305). The effect of White race is practically significant, and OR > 4 also represents a "strong effect" (Ferguson, 2016, p. 305). The effect of Black/African race is very small and not practically significant at OR = 1.71. Black/African American race, at $\chi^2(1) = 0.32$, $p = .572$, did not statistically significantly predict retention to the semester among nursing students after boot camp participation. However, race as a category did provide some significant results. The researcher rejected the null hypothesis at $\chi^2(1) = 6.72$, $p = .010$ for Hispanic race, and $\chi^2(1) = 9.28$, $p = .002$ for White race, and can state that Hispanic and White race statistically significantly predicted retention to the second semester among nursing students after boot camp participation.

Table 18

Race and Retention to Second Semester After Boot Camp Participation

Independent variable	Regression Coefficient	Wald	df	*p*	OR	95% CI	
						Lower	Upper
Hispanic	1.72	6.72	1	0.010	5.57	1.52	20.38
White	2.14	9.28	1	0.002	8.51	2.15	33.78
Black/African American	0.53	0.32	1	0.572	1.71	0.27	10.92

$H_0$8: *There is no statistically significant predictive correlation between student financial aid status and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college*.

Table 19 presents the binary logistic regression model prediction that when financial aid status is "Yes" then the likelihood of first semester completion is OR = 0.83, $p = .546$, relative to "No" with 95% CI (0.46, 1.51) capturing 1.0. The effect of financial aid status is very small and not practically significant at OR = 0.83. The researcher failed to reject the null hypothesis at

$\chi^2(1) = 0.36$, $p = .546$, and can state that financial aid status did not statistically significantly predict successful completion of the first semester among nursing students after boot camp participation.

Table 19

Financial Aid Status and Successful First Semester Completion after Boot Camp Participation

Independent variable	Regression Coefficient	Wald	df	*p*	OR	95% CI	
						Lower	Upper
Financial Aid Status	-0.18	0.36	1	0.546	0.83	0.46	1.51

$H_0$9: *There is no statistically significant predictive correlation between student financial aid status and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.*

Table 20 presents the binary logistic regression model prediction that when financial aid status is "Yes" then the likelihood of retention to the second semester is OR = 0.83, $p = .546$, relative to "No" with 95% CI (0.46, 1.51) capturing 1.0. The effect of financial aid status is very small and not practically significant at OR = 0.83. The researcher failed to reject the null hypothesis at $\chi^2(1) = 0.36$, $p = .546$, and can state that financial aid status did not statistically significantly predict retention to the second semester among nursing students after boot camp participation.

Table 20

Financial Aid Status and Retention to Second Semester Completion after Boot Camp Participation

Independent variable	Regression Coefficient	Wald	df	*p*	OR	95% CI	
						Lower	Upper
Financial Aid Status	-0.18	0.36	1	0.546	0.83	0.46	1.51

Summary

This research study attempted to answer two research questions using a chi-square test of independence for research question one and binary logistic regression for research question two. The results of the chi-square test were significant based on the actual alpha value of $p = .05$, $\chi^2(1, 226)$, $p < .001$, suggesting that successful first semester completion and retention to the second semester of the ADN program after boot camp participation are related to one another.

Regarding research question two, binary logistic regression and the cross-tabulation analysis was significant based on the actual alpha value of $p = .05$, $\chi^2(7) = 15.732$, $p = .028$, determining that generational cohort and race/ethnicity predicted successful first semester completion and retention of nursing students (N =227) after boot camp participation in a pre-licensure, undergraduate ADN program at a community college. Hispanic and White nurses were more likely to progress than Black/African American nurses. The practical significance of race/ethnicity was greater than the practical significance of the generational cohort. The effects of gender and financial aid had little or no practical significance.

CHAPTER FIVE: CONCLUSIONS

Overview

The purpose of this non-experimental correlational predictive quantitative study was to investigate the relationship between successful first semester completion and retention to the second semester after boot camp participation and to discover predictive correlations to student age, categorized by generational cohort, gender, race, and financial aid status with successful first semester completion and retention of nursing students after boot camp participation at a community college in the rural Southwestern region of the United States. Archival data consisting of information related to first semester nursing students in an undergraduate, pre-licensure ADN program at a rural community college in the Southwest across a five-year period from 2018-2022 was used in this study. Data were analyzed using a chi-square test of independence for research question one, and cross-tabulations with binary logistic regression for research question two. Chapter Five provides a discussion of the research study, practical and theoretical implications drawn from the research, limitations of the study, and recommendations for future research based on the data analysis of the current study.

Discussion

The following discussion of the current study is organized by the research questions and led by the study results with connections to current student retention literature and theory. Based on archival data of 227 nursing students who participated in the boot camp prior to the first semester of the ADN program over the past five years, the study findings indicated that the majority of students successfully completed the first semester and were retained to the second semester. The results also suggested that generational cohort and race were predictive of

successful first semester completion and retention to the second semester of the ADN program after boot camp participation.

Research Question One

Research question one asked "Is there an associative relationship between first semester completion and retention of nursing students to the second semester after boot camp participation in a pre-licensure, undergraduate ADN program at a community college?" According to the analysis of the data, the answer to this research question is 'yes', there is a relationship.

Hypothesis One

Successful first semester completion and retention of nursing students to the second semester after boot camp participation demonstrated a statistically significant relationship among participants in a pre-licensure, undergraduate ADN program at a community college. The practical significance of this finding indicated that students who successfully completed the first semester (n = 159) of the ADN program were also retained in the second semester (n = 159) of an ADN program after boot camp participation.

The researcher rejected the null hypothesis at $\chi^2(1, 226)$, $p < .001$, Cramer's V = 1.0, indicating that there is a significant association between the two variables: successful first semester completion and retention to the second semester after boot camp participation. The chi-square analysis indicated that a minority (n = 68, 30.0%) of the 227 participants who participated in the boot camp did not successfully complete the first semester of the ADN program. The same participants who did not successfully complete the first semester were also not retained in the second semester. The results also indicated that the majority of the participants who participated in the boot camp (n = 159, 70.0%) successfully completed the first semester and were also

retained to the second semester. The participants who both completed the first semester and were retained in the second semester after boot camp participation were all the same nursing students.

This finding supports prior research related to nursing student retention and the implementation of retention strategies for improved student outcomes. Jeffreys (2012) states that nursing student retention strategies aimed at improving student outcomes, such as retention and successful program completion, are linked to improved student success and may also reduce nursing program attrition rates. Studies found in the literature on pre-nursing student boot camps show similar results to the current study. Fontaine (2014) reported improved student retention and program completion rates after implementation of a two-day, on campus, comprehensive retention program with statistically significant results ($p = 0.048$). In a similar study, Kinney et al. (2017) discovered a decrease in attrition rates among first semester students after implementing a one-day boot camp for beginning nursing students, reporting that 92% ($n = 20.24$) of the participants ($N = 22$) perceived the boot camp as helpful to their success.

Tinto (2012a) theorizes that early student socialization and integration into the program may improve student commitment and achievement of goals. Furthermore, student attrition varies depending on semester, with most students leaving their programs in the first semester. In the current study, participation in the pre-nursing student boot camp was a constant variable for all of the participants in the study, and a majority of the students did successfully complete the first semester and were also retained in the ADN program after boot camp participation. However, it is important to note that although there was a significant association between first semester completion and retention to the second semester after boot camp participation, it is unclear if boot camp participation was the only factor related to the significant association because all of the participants in this study participated in the boot camp.

Research Question Two

Research question two asked "To what extent does student age, categorized by generational cohort, gender, race, and financial aid status predict successful first semester completion and retention of nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college?" According to the analysis of the data, generational cohort and race predicted successful first semester completion and retention of nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college. The practical significance of race was greater than the practical significance of the generational cohort. Hispanic and White nurses were more likely to progress than Black/African American nurses. The effects of gender and financial aid had little or no practical significance.

Hypothesis Two

The binary logistic regression model was significant at $\chi^2(7) = 15.732$, $p = .028$, suggesting that gender, race, generational cohort, and financial aid status had a significant effect on the odds of observing the "Yes" category of successful first semester completion and retention to the second semester of the ADN program. As previously stated, the Nagelkerke R^2 value calculated for this model was 0.095, meaning the model explained 9.5% of the variance in successful first semester completion and retention to the second semester and correctly classified 71.8% of cases. Sensitivity was 96.2%, specificity was 14.7%, positive predictive value was 72.5%, and negative predictive value was 62.5%. Of the four predictor variables, only two were statistically significant: generational cohort and race. The other two predictor variables: gender and financial aid status, were not statistically significant. A discussion about the findings for each of the predictor variables follows below.

Generational Cohort. The researcher found that generational cohort statistically significantly predicted successful completion of the first semester and retention to the second semester after boot camp participation in the and program according to the binary regression model at, $\chi^2(1) = 4.21$, $p = .040$. The researcher rejected the null hypotheses ($H_0 2$ and $H_0 3$) at $p = .040$, with 95% CI (0.32, 0.97). However, the odds ratio (OR) = 0.55, indicated a small effect. The proportions of nursing students within Generations X ($n = 8$, 80.0%) and Generation Y ($n = 70$, 74.5%) who successfully completed the first semester and who were retained in the second semester were similar. The proportion of Generation Z who successfully completed the first semester and were also retained in the second semester was smaller (n = 81, 65.0%).

Current studies found in the literature on nursing student retention and attrition support these findings, reporting that pre-nursing students may not be prepared for the rigors of the nursing program and underestimate the time commitment and stressors experienced as a new nursing student (Alghamdi et al., 2019; Everett, 2022; Jeffreys, 2020; ten Hoeve et al., 2017), and a significantly higher probability that older nursing students were more likely to progress than those who are younger (Wray et al., 2017). Generation Z student learning needs differ from those of Generations X and Y, as students in that generation prefer satisfaction with their ability to access and utilize information technology and work independently (DiMattio & Hudacek, 2020). Furthermore, failure to meet these learning needs and expectations, specifically related to satisfaction, may increase Generation Z students' risk for attrition from nursing programs. With high numbers of Baby Boomer and Generation X nurse educators, it is imperative to use purposeful awareness of generational demographics and sensitivity to differences to improve nursing student retention efforts (Billings & Halstead, 2020).

In contrast to this study and the studies cited above, numerous researchers report that non-traditional (age 25 and over) students have been found to be at greater risk of attrition from nursing programs, especially in the first semester (Everett, 2022; Jeffreys, 2012; Margarit & Kennedy, 2019; Thomas et al., 2023). Similarly, theoretical views on student retention of non-traditional students (Jeffreys, 2012; Tinto, 1999) are also in contrast with the findings that Generation X and Y students are more successful than more traditional Generation Z students. Both Tinto (1999) and Jeffreys (2012) theorize that non-traditional students may find it more difficult to achieve success in higher education owing to other life demands such as family, work, and finances. In the current study, although most of the participants were in the Generation Z category, percentage-wise, fewer of those participants were successful in first semester completion and retention to the second semester after boot camp participation compared to the participants in the Generation X and Generation Y categories.

Gender. The researcher found that gender did not statistically significantly predict successful completion of the first semester or retention to the second semester after boot camp participation in the ADN program according to the binary logistic regression model, at $\chi^2(1) = 0.56$, $p = .456$. The researcher the failed to reject the null hypotheses ($H_0$4 and $H_0$5) at $p = 0.456$, OR = .68 (very small effect), finding that when gender is male then the likelihood of successful first semester completion and retention to the second semester in the ADN program was not significant relative to female with 95% CI (0.25, 1.86). The proportions of male and female nurses in the "Yes" category were similar (69.8% and 72.0% respectively).

Similarly, a study exploring pre-registration nursing students' age and gender (Wray et al., 2017) did not find significant statistical correlation between male gender and successful completion of undergraduate nursing programs in Scotland. However, the findings from this

study and the current study are inconsistent with another recent study (Powers et al., 2018) citing gender bias, being singled out, gender role stereotyping, limitations in clinical settings, and lack of male role models as barriers to successful completion and retention in a nursing program. Theoretical views also support male gender as a barrier to retention and successful completion of undergraduate nursing programs (Tinto, 1999; Jeffreys, 2012). The current study did not find a correlation to either support or negate the effect of gender on successful first semester completion and retention to the second semester of the ADN program after boot camp participation.

Race. The researcher found that student race statistically significantly predicted successful completion of the first semester and retention to the second semester after boot camp participation in the ADN program for Hispanic and White students according to the binary logistic regression model, at $\chi^2(1) = 6.72$, $p = .010$ for Hispanic race and $\chi^2(1) = 9.28$, $p = .002$ for White race. The researcher rejected the null hypotheses ($H_0$6 and $H_0$7) at $p = .010$, OR = 5.57 (strong effect) with 95% CI (1.52, 20.38) for Hispanic race and $p = .002$, OR = 8.51 (strong effect) with 95% CI (2.15, 33.78) for White race. However, the findings for Black/African American race, $\chi^2(1) = 0.32$, $p = .572$, OR 1.72 (very small effect) with 95% CI (0.27, 10.92) were not significant.

The majority of the participants were Hispanic ($n = 139$, 61.2%), followed by White ($n = 67$, 29.5%), Black/African American ($n = 9$, 4%), and other races ($n = 7$, 3.1%). However, the proportion of White nurses who successfully completed the first semester and who were also retained in the second semester of the ADN program (79.8%) was higher than the proportions of Hispanics (69.8%); Black/African Americans (55.6%); and Other racial/ethnic groups (57.1%).

The findings regarding race in this study are similar to the findings in another study that explored determinants of attrition of first semester undergraduate nursing students (Barbé et al., 2018) reporting that Caucasian students were more successful than those students who identified as African American, Hispanic, or another race. Additionally, student retention theory (Tinto, 1999; Jeffreys, 2012) supports these findings and the current study findings suggesting that students from minority and underrepresented backgrounds are less likely to be retained and successful in undergraduate nursing programs.

Financial Aid Status. The researcher found that financial aid status did not statistically significantly predict successful completion of the first semester or retention to the second semester after boot camp participation in the ADN program according to the binary logistic regression model at $\chi^2(1) = 0.36$, $p = .546$. The researcher failed to reject the null hypotheses ($H_0 8$ and $H_0 9$) at, $p = .546$, OR = 0.83 (very small effect) with 95% CI (0.46, 1.51). The proportions of nurses with and without financial aid who were retained in the program were similar (71.8% and 68.4% respectively).

The findings from this study contrast with findings from the literature stating that financial status and family financial support may have significant influence on student retention and may be interpreted as either supportive or restrictive depending on student perspective (Jeffreys, 2020; Priode et al., 2020). Student retention theory (Tinto, 1999; Jeffreys, 2012) also views financial status as a factor that either supports or hinders student retention and successful completion of an undergraduate nursing program. The current study did not find a correlation to either support or negate the effect of financial aid status on successful first semester completion and retention to the second semester of the ADN program after boot camp participation.

Implications

There was a statistically significant association between successful completion of the first semester and retention to the second semester after boot camp participation. Generational cohort and race indicated a statistically significant predictive correlation with successful completion of the first semester and retention to the second semester after boot camp participation in an undergraduate, pre-licensure ADN program in a community college in the rural Southwest. Gender and financial aid status did not indicate a statistically significant predictive correlation with first semester completion and retention to the second semester after boot camp participation. Implications of importance for nursing education related to student success and retention in the current study include theoretical support and early identification of students who may be at risk.

Supporting students with retention strategies that are grounded in sociology theory appears to be an effective approach for first semester success and retention. Tinto's theory focuses on the identification of factors that affect attrition and those that improve retention of students in higher education (Tinto, 1975; 1999). The nursing program under study implemented the boot camp using Tinto's theory applied to a nursing student retention strategy (Appendix A), the pre-nursing student boot camp (Appendix C). The theoretical model provides a pathway to student success. Nurse educators must understand pre-entry student attributes to assess student learning needs and engage them in formal and informal academic and social experiences in order to achieve goal commitment leading to retention and persistence to program completion. The boot camp's intent was to facilitate early identification of at-risk students, integrate students both socially and academically into the program by fostering formal and informal experiences with faculty, peers, and college support services, and ultimately to support persistence leading to retention and completion. The current study findings supported the theoretical framework and

indicated that after boot camp participation, a majority of the students did successfully complete the first semester and were retained to the second semester.

Pre-entry student attributes that may affect retention of students in the nursing program such as generational cohort, gender, race, and financial aid status were examined with significant findings related to generational cohort and race. As previously stated, Billings and Halstead (2020) suggest that implications of knowledge gained by purposeful awareness of generational demographics for nursing educators are significant to the teaching-learning process. Increased nursing educator awareness and sensitivity to generational differences among nursing students may improve nursing retention efforts. The nurse educators in the program under study are either Baby Boomers, Generation Xer's, or Millennials, while the majority of the students are Generation Zs. This gap in diversity amongst faculty and students could be part of the reason for the higher number of Generation Z students who were unsuccessful compared to Generations X and Y.

Besides integration and academic socialization, the nurse educators in this program strived to create a retention strategy that would support and foster student goal achievement and commitment to success. Recognition of different learner needs and maximizing opportunities for student success is also a priority. The findings related to generational cohort support the need for nurse educators to recognize generational diversity and provide social and academic experiences that enhance and support integration and accomplishment into their programs.

This study adds to the body of knowledge and student retention theory by exploring the variables associated with undergraduate nursing student successful completion of the first semester and retention to the second semester after participating in a one-day boot camp prior to entry in an ADN program. Early implementation of nursing student retention strategies is needed

to identify at-risk students and to facilitate success for all students. Williams and Dahan (2022) showed the importance of recognizing and understanding that barriers may exist for students related to educational equity, especially for students from diverse backgrounds, stating that early recognition is key. The current study aimed to examine nursing students' success after participation in the boot camp as a retention strategy. The boot camp was implemented to identify at-risk students early on, to foster student connections to academic and social interaction, and to help prepare them for the reality of being a nursing student.

By understanding the correlations of student characteristics to success and retention, nurse educators may be better equipped to develop retention strategies that support students prior to entry in ADN programs and throughout the program to completion. Nursing student retention strategies are intended to support and improve student socialization and integration skills that facilitate student success and goal achievement (Jeffreys, 2020). Long term, these strategies have the potential to grow and evolve as they are developed by nurse educators to improve student retention and program completion which in turn may improve the national nursing shortage.

The findings from this study are meaningful and clinically significant as they may inform the development and implementation of holistic strategies to improve first semester nursing student success and goal attainment. By understanding the association between first semester completion and retention to the second semester, nursing faculty can support nursing students by recognizing each student's unique characteristics such as generational cohort, gender, race, and financial status and provide strategies that consider the needs of the individual as well as the cohort. The community college nursing program in this study implemented the boot camp as a retention strategy to improve student outcomes. The boot camp has undergone revisions based on

student and faculty feedback and outcomes and will continue to develop in light of the findings from this study.

Limitations

The research study was limited to a single ADN program in the Southwestern United States. It is unknown if there are other ADN programs in this geographic region that are utilizing similar retention strategies for comparison. Therefore, although the sample size included five years of consecutive cohorts from a single institution, it is difficult to generalize the findings from this study to other ADN programs in the nation.

Recommendations for Future Research

This study focused on a retention strategy implemented in one ADN program in a rural community college in the Southwestern United States across a five-year period. Future research might include a comparison of this retention strategy to similar retention strategies in other ADN programs in the region allowing for a larger sample size which may produce more generalizable results. It may also be useful to compare the results of this study to prior success and retention within the same ADN program prior to implementation of the boot camp.

Another possibility for future research would be to conduct a similar study using a qualitative study design to better understand the essence of the participants' experiences with the boot camp and its impact on their success. Gaining insight from different generational cohorts, genders, races, and students receiving or not receiving financial aid may provide meaningful results. Gathering student, faculty, and student support services’ perspectives about the effectiveness of the boot camp related to social and academic integration leading to commitment and goal attainment may be informative to nursing educators about what is working and what can be improved.

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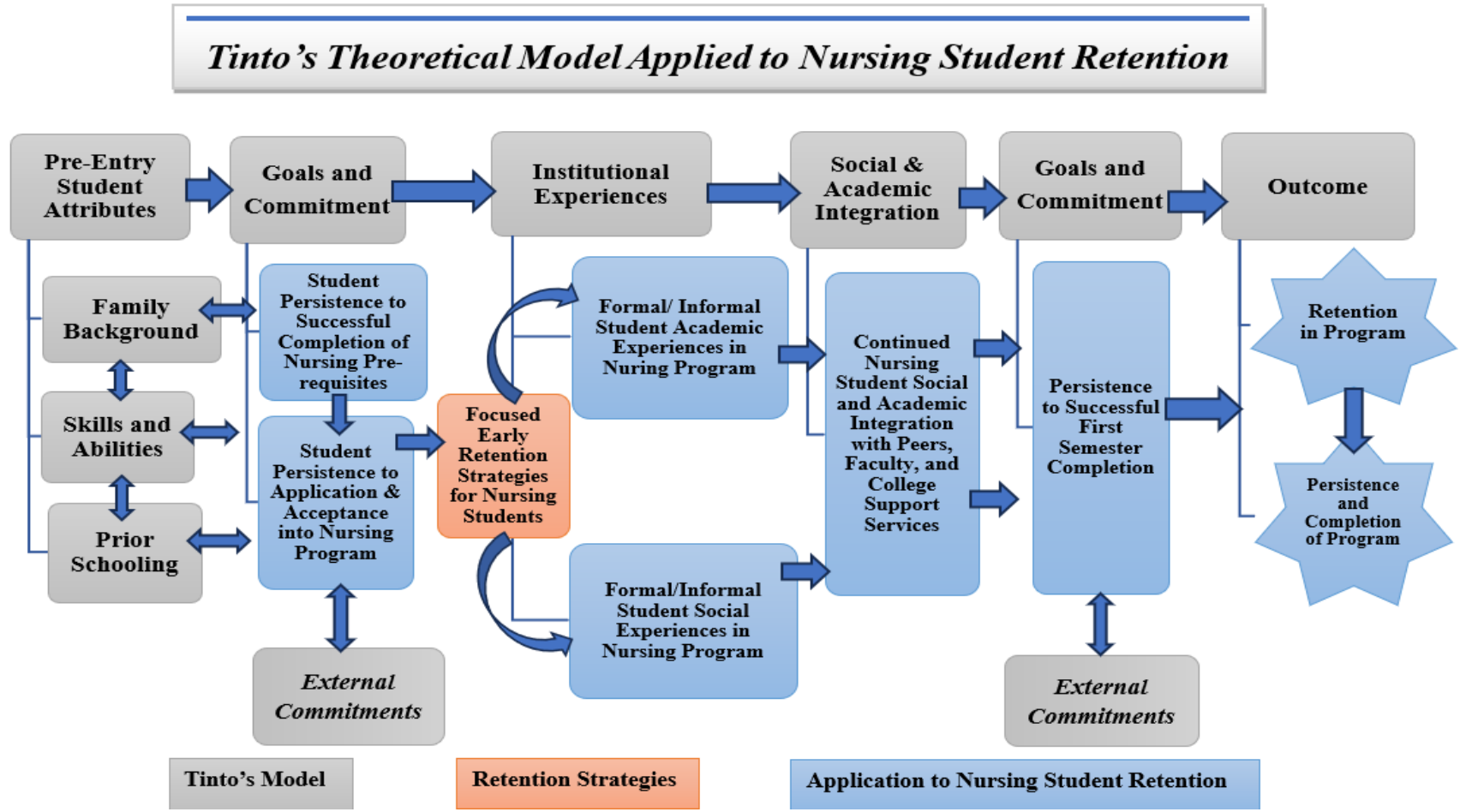
APPENDIX A

Tinto's Theoretical Model Applied to Nursing Student Retention

Figure 1

Tinto's Theoretical Model Applied to Nursing Student Retention



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APPENDIX B

Jeffrey's Nursing Universal Retention & Success (NURS) Model – 2020

Figure 2

Jeffrey's Nursing Universal Retention & Success (NURS) Model – 2020

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APPENDIX C

Boot Camp Description and Student Objectives

Boot Camp Description

Within one nursing program in the recent past, nursing educators and administration were concerned that students were unprepared academically and professionally for the program's rigors, causing higher attrition rates. Other areas of concern included lack of knowledge regarding medical terminology, inability to pass the first dosage calculations examination in two attempts, success in skills checkoffs, and lack of help-seeking behaviors. Nursing educators reviewed exit interviews for reasons attributing to the high attrition rate and found that a large number of students failed at different times during the first semester due to second attempt failure on the dosage calculations exam, third-attempt failure on skills performance check-off, or failure to complete the course with the minimum grade required. Other reasons for attrition included personal or behavioral issues. Nursing educators' assumptions regarding the failure were based on comments made by students on their exit interview forms and included: (a) Students felt academically unprepared for the rigors of the program; (b) Students lacked the ability to manage time appropriately; (c) Students did not understand the professional expectations of the program; (d) Students did not understand the culture of the nursing program and how it was different from previous college experiences; and (e) Students did not actively seek help or know what help was available. Based on these assumptions, the nursing educators wanted to create a strategic opportunity to welcome students and facilitate the transition from previous college experiences to the nursing program and address areas of observed weaknesses including professional and social integration, time management, help-seeking behaviors, dosage calculations, medical terminology, and skills.

A pre-nursing student boot camp was created by the nursing educators to help mitigate the problem by using an innovative approach to student retention. The boot camp consisted of two parts. Part one of the boot camp began with acceptance into the nursing program. At that time, students received their acceptance letters along with a medical terminology packet and a dosage calculations packet. Completion of these packets is mandatory and serves as the student's 'ticket' to boot camp. Part two consisted of a one-day, 12-hour, intensive program on campus prior to the beginning of the semester and was mandatory for all students entering the first semester of the ADN program. The boot camp has been held for pre-nursing students accepted into the program for the past five years. The boot camp has evolved over the years, and changes have been implemented based on student feedback and outcomes to address student needs and to ensure quality of the program.

Boot Camp Student Objectives

After attending the one-day boot camp intensive on campus, pre-nursing students entering the ADN program should be able to:

1. Understand specific requirements, policies, and procedures as outlined in the Student Nurse Handbook.
    a. Describe behavioral expectations of a student nurse in the nursing program.
    b. Describe the purpose of the Action Plan and Learning Contract.
    c. Describe the social media policy.
    d. Describe Health and Insurance Portability and Accountability Act (HIPAA).
    e. Describe the grading policy and how it differs from other academic programs and courses.
        i. Understand the grading policy for testing and assignments.
        ii. Understand the importance of academic honesty.
    f. Describe the dress code and equipment requirements as a student in the nursing program.
2. Have a better understanding about the culture of the nursing program and begin to develop a professional identity.

   a. Understand role as a nursing student individually and as a member of the nursing peer group.
   b. Identify nursing educator advisors and their purpose in facilitating success in the nursing program.
   c. Identify program and campus student resources and their purpose in facilitating success in the nursing program.
   d. Socialize with peers and nurse educator to begin making connections for support and success in the ADN Program.
   e. Understand what is meant by nursing professional.
   f. Begin to demonstrate appropriate attitudes of a student nurse for dedication to the nursing profession and fulfillment of student learning outcomes.
   g. Identify expected professional values/characteristics/virtues inherent to nursing.
   h. Recognize civil versus uncivil behavior.
   i. Reflect on personal reasons for wanting to be a nurse.
3. Recognize the time commitment associated with being a full-time nursing student in the nursing program.
   a. Understand the meaning of educational/life balance.
   b. Prioritize educational and life requirements to establish balance while in nursing school.
   c. Identify obstacles that could potentially impede success in the nursing program.
4. Identify a support system.
   a. Recognize the need for and importance of support from nursing educators, peers, friends, and family as a student in the nursing program.
   b. Identify student resources that can help students when more support is needed.
   c. Identify student resources for success within the college and the nursing program, i.e., financial aid, tutoring, and retention specialist.
5. Identify the role of time-management skills to be successful in the nursing program.
   a. Begin to organize nursing program commitments in a planner for success.
   b. Prioritize education to meet goals and student outcomes for the first semester of the nursing program.
   c. Develop a plan for attending class/lab/clinical/sims on time and for studying, family time, job, etc.
6. Understand the importance of dosage calculation formulas and their application in nursing.
   a. Accurately calculate medication dosages in the post-dosage calculations test with at least 90% accuracy.

7. Understand the importance of medical terminology as it applies to nursing knowledge and skills.
    a. Apply concepts of medical terminology content module accurately in completion of the medical terminology assignment.
8. Begin to understand the elements of nursing documentation.
9. Understand the importance of mental health and self-care.
10. Prepare for the first day of the nursing program.

APPENDIX D

Individual Student Characteristic Data Collection Sheet

Gender:
Male_____
Female_____

Year of Birth: _____

Age: _____

Generational Cohort:
Generation X (1965-1980) ____
Generation Y (1981-1996) ____
Generation Z (1997 or after) ____

Race:
American Indian or Native Alaskan_____
Asian or Native Hawaiian or Pacific Islander_____
Black or African American_____
Latino or Hispanic_____
White or Caucasian _____
Other_____

Received Financial Aid:
Yes ____
No ____

Participated in Boot Camp
Yes ____
No ____

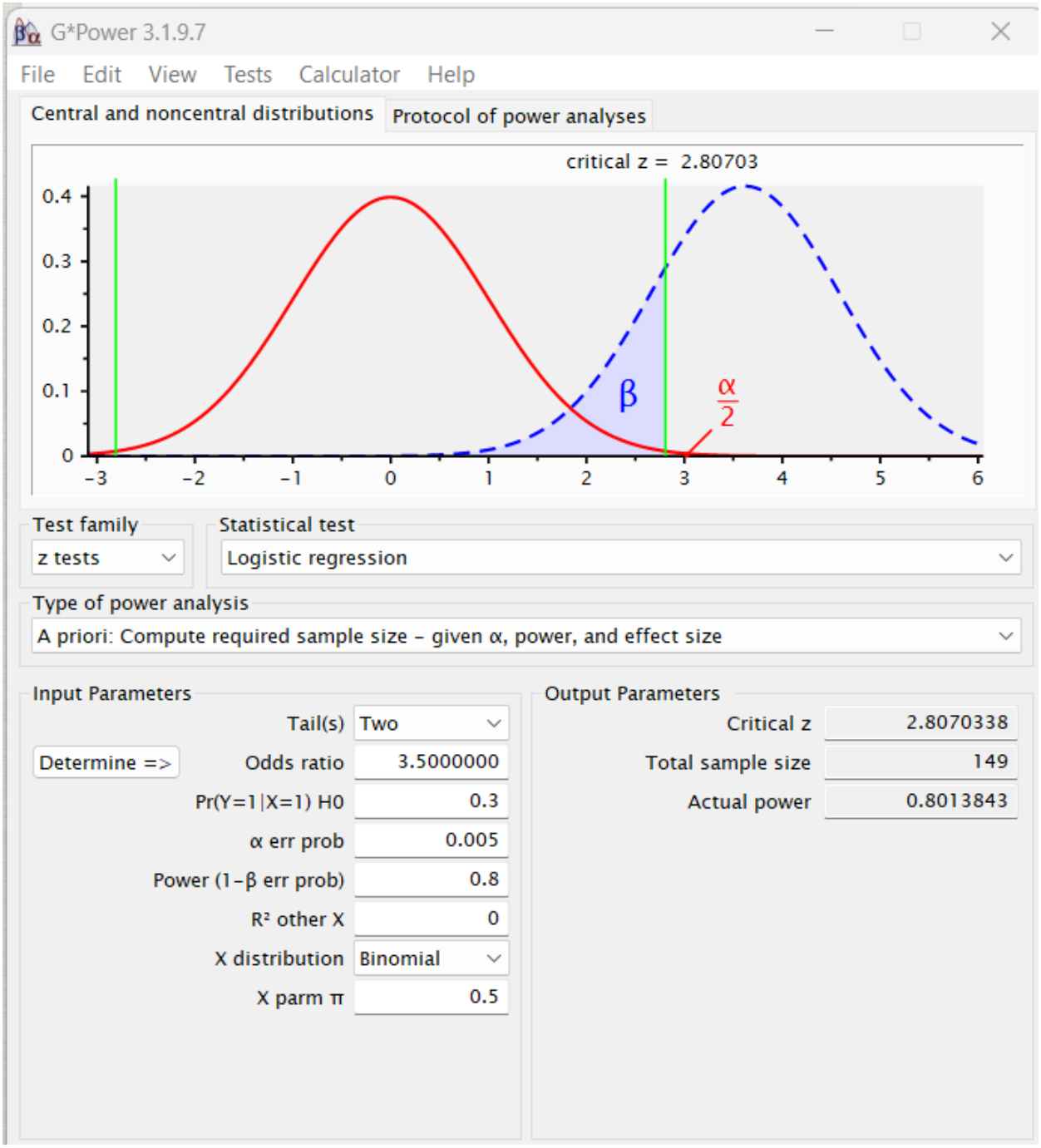
Successfully Completed 1st Semester of ADN Program:
Yes ____
No ____

Progressed to 2nd Semester of ADN Program:
Yes ____
No ____

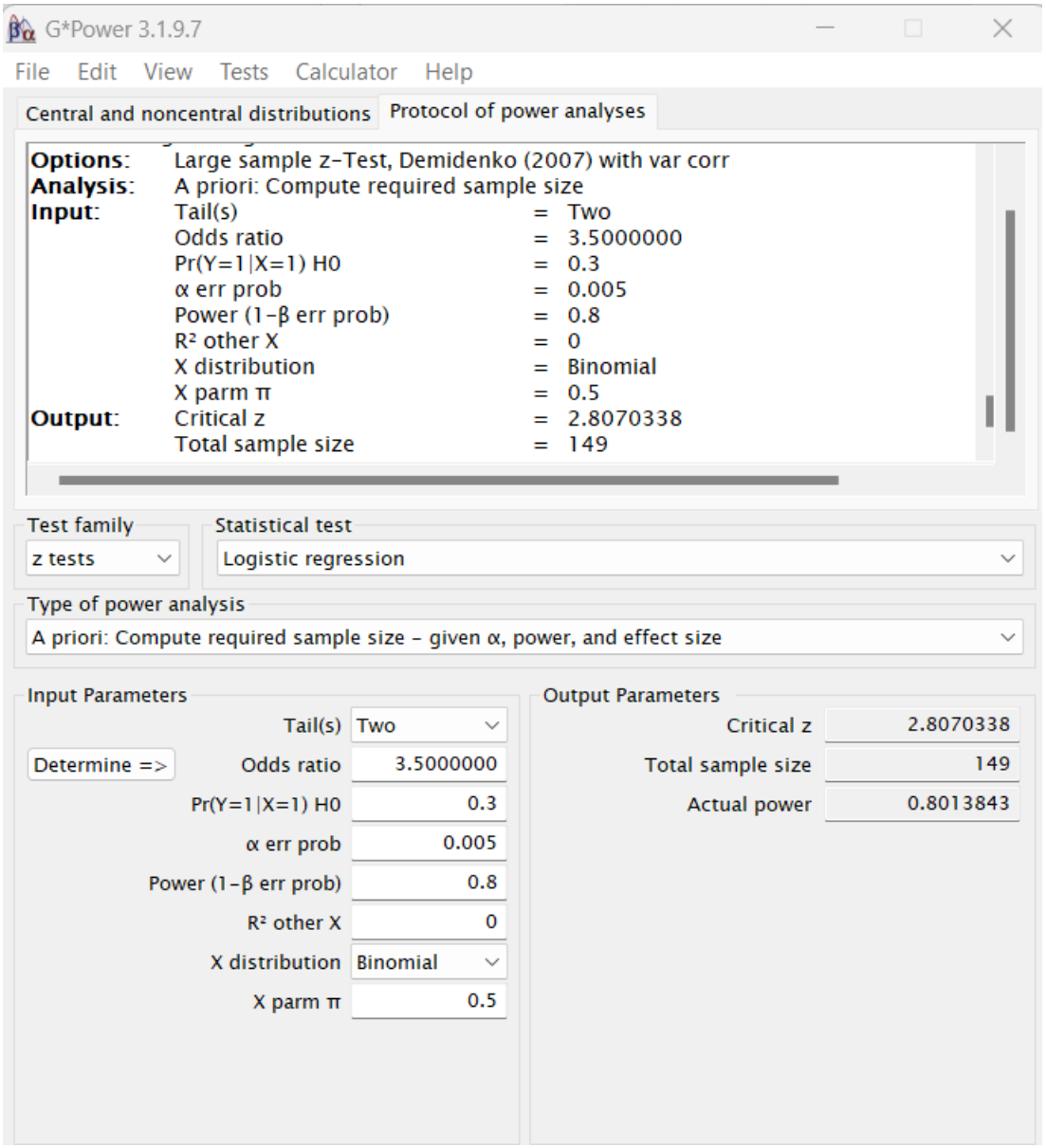
APPENDIX E

G*Power A Priori Analysis for Sample Size Calculation

Central and Noncentral Distributions



Protocol of Power Analyses



APPENDIX F

Student Characteristics

Student Characteristics Table

Student Characteristic Variable	Number of Participants (N = 227)
Age by Generational Cohort	Generation X = 10 Generation Y = 94 Generation Z = 123
Gender	Male = 25 Female = 202
Race	American Indian or Native Alaskan = 2 Asian or Native Hawaiian or Pacific Islander = 3 Black or African American = 9 Hispanic or Latino = 139 White or Caucasian = 67 Two or more races, other, or not specified = 7
Financial Aid Status	Yes = 117 No = 110
Participated in Boot Camp	Yes = 227 No = 0
Successfully Completed 1st Semester of Nursing Program	Yes = 159 No = 68
Progressed to 2nd Semester of Nursing Program	Yes = 159 No = 68

Coding of Student Characteristics

Coding of Student Characteristics Table

Student Characteristic Variable	Scale	Code
Age by Generational Cohort	Ordinal	1=Generation X 2=Generation Y/Millennial 3=Generation Z
Gender	Nominal	1=Male 0=Female
Race	Nominal	1=American Indian or Native Alaskan 2=Asian or Native Hawaiian or Pacific Islander 3=Black or African American 4=White or Caucasian 5=Hispanic or Latino 6=Two or more races, other, or not specified

Student Characteristic Variable	Scale	Code
Financial Aid Status	Nominal	1=yes 0=no
Participated in Boot Camp	Nominal	1=yes 0=no
Successfully Competed 1st Semester of ADN Program	Nominal	1=yes 0=no
Progressed to 2nd Semester of ADN Program	Nominal	1=yes 0=no

APPENDIX G

IRB and Study Site Permission Documents

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

November 9, 2023

Misty Stine
Theresa Pape

Re: IRB Application - IRB-FY23-24-710 The Predictive Relationship Between Pre-Nursing Boot Camp Participation and Successful Completion of the First Semester and Retention in an Associate Degree Nursing Program

Dear Misty Stine and Theresa Pape,

The Liberty University Institutional Review Board (IRB) has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds that your study does not meet the definition of human subjects research. This means you may begin your project with the data safeguarding methods mentioned in your IRB application.

Decision: No Human Subjects Research

Explanation: Your study is not considered human subjects research because it will not involve the collection of identifiable, private information from or about living individuals (45 CFR 46.102).

Please note that this decision only applies to your current application. Any modifications to your protocol must be reported to the Liberty University IRB for verification of continued non-human subjects research status. You may report these changes by completing a modification submission through your Cayuse IRB account.

For a PDF of your IRB letter, click on your study number in the My Studies card on your Cayuse dashboard. Next, click the Submissions bar beside the Study Details bar on the Study Details page. Finally, click Initial under Submission Type and choose the Letters tab toward the bottom of the Submission Details page.

If you have any questions about this determination or need assistance in determining whether possible modifications to your protocol would change your application's status, please email us at irb@liberty.edu.

Sincerely,

G. Michele Baker, PhD, CIP
Administrative Chair
Research Ethics Office

11/06/2023

Misty Stine
Doctoral Student
Liberty University School of Nursing
[redacted]

Dear Misty Stine:

After careful review of your research proposal entitled *The Predictive Relationship Between Pre-Nursing Boot Camp Participation and Successful Completion of the First Semester and Retention in an Associate Degree Nursing Program*, we have decided to grant you permission to conduct your study at New Mexico Junior College (NMJC) and receive and utilize first semester nursing student archival data from years 2018-2022 for your research study.

Check the following boxes, as applicable:

☒ The requested data WILL BE STRIPPED of all identifying information before it is provided to the researcher.

☒ We are requesting a copy of the results upon study completion and/or publication.

Sincerely,

[redacted]

Dr. William Brown
Vice President for Institutional Research, Planning, and Effectiveness
Institutional Review Committee Chair

[redacted]

APPENDIX H

Overview of Statistical Analysis and Research Question Changes

During data collection, organization, and analysis, the researcher discovered that all of the variables for this study were categorical including only nominal dichotomous dependent with only two possible outcomes, and nominal or ordinal independent variables. This differed from what was anticipated prior to data collection. Therefore, the data did not meet all of the assumptions for multiple linear regression analysis as originally proposed in Chapter three. In light of this finding, the analysis plan was revised. The first research question was also revised. The following includes a description of the necessary changes for data analysis.

The first research question did not meet the assumptions for multiple linear regression analysis as proposed. Rather than what was expected, all of the participants in this study attended the boot camp prior to program admission. There were no participants who did not participate in the boot camp. This finding made it impossible to use boot camp participation as a predictor variable creating analysis issues with the proposed method. Since boot camp participation was the only predictor variable for research question one, the question was reframed from a prediction correlation to an associative correlation question. Therefore, a chi square test of independence was conducted to examine the relationship of successful first semester completion and retention to the second semester of the ADN program after boot camp participation to answer the first research question. Due to the binary or ordinal coding of independent and dependent variables in research question two, binary logistic regression was determined to be the most appropriate method for analysis of the data and to test the second research question. The original research questions and hypotheses with null hypotheses are included below.

Original Research Questions

RQ1: To what extent does participation in a one-day pre-nursing student boot camp predict successful first semester completion and retention of nursing students in a pre-licensure, undergraduate, ADN program at a community college?

RQ2: To what extent does student age, categorized by generational cohort, gender, race, and financial aid status predict successful first semester completion and retention of nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college?

Original Hypotheses

H1: Participation in a one-day pre-nursing student boot camp statistically significantly predicts successful completion of the first semester and retention in a pre-licensure, undergraduate ADN program at a community college.

H2: There is a statistically significant predictive correlation between nursing student generational cohort, gender, race, and financial aid status, and successful completion of the first semester and retention after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$1: Boot camp participation does not statistically significantly predict successful completion of the first semester among nursing students in a pre-licensure, undergraduate ADN program at a community college.

$H_0$2: Boot camp participation does not statistically significantly predict retention among nursing students in a pre-licensure, undergraduate ADN program at a community college.

$H_0$3: There is no statistically significant predictive correlation between student generational cohort and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$4: There is no statistically significant predictive correlation between student generational cohort and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$5: There is no statistically significant predictive correlation between student gender and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$6: There is no statistically significant predictive correlation between student gender and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$7: There is no statistically significant predictive correlation between student race and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$8: There is no statistically significant predictive correlation between student race and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$9: There is no statistically significant predictive correlation between student financial aid status and successful completion of the first semester among nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

$H_0$10: There is no statistically significant predictive correlation between student financial aid status and retention of first semester nursing students after boot camp participation in a pre-licensure, undergraduate ADN program at a community college.

APPENDIX I

Cross-tabulations of Frequencies for Independent and Dependent Variables

Cross-tabulations of Generational Cohorts and First Semester Completion and Retention to Second Semester After Boot Camp Participation

Cross-tabulation of Generational Cohorts First Semester Completion after Boot Camp Participation in ADN Program

Generational Cohort	Completed First Semester of ADN Program			
	No		Yes	
	n	%	*n*	%
X	2	20.0	8	80.0
Y	24	25.6	70	74.5
Z	42	34.1	81	65.9
Total	68	30.0	159	70.0

Note: Cramér's V = .102, p = .304

Cross-tabulation of Generational Cohorts Retention to Second Semester after Boot Camp Participation in ADN Program

Generational Cohort	Retained to Second Semester of ADN Program			
	No		Yes	
	n	%	*n*	%
X	2	20.0	8	80.0
Y	24	25.6	70	74.5
Z	42	34.1	81	65.9
Total	68	30.0	159	70.0

Note: Cramér's V = .102, p = .304

Cross-tabulations of Gender and First Semester Completion and Retention to Second Semester After Boot Camp Participation

Cross-tabulation of Gender First Semester Completion after Boot Camp Participation in the ADN program.

Gender	Completed First Semester of ADN Program			
	No		Yes	
	n	%	*n*	%
Female	61	30.2	141	69.8
Male	7	28.0	18	72.0
Total	68	30.0	159	70.0

Note: Cramér's V = .016, p = .821

Cross-tabulation of Gender First Semester Completion after Boot Camp Participation in the ADN program.

Gender	Retained to the Semester of ADN Program			
	No		Yes	
	n	%	*n*	%
Female	61	30.2	141	69.8
Male	7	28.0	18	72.0
Total	68	30.0	159	70.0

Note: Cramér's V = .016, $p = .821$

Cross-tabulations of Race/Ethnicity and First Semester Completion and Retention to Second Semester After Boot Camp Participation

Cross-tabulation of Race/Ethnicity with First Semester Completion after Boot Camp Participation in ADN Program

Race/Ethnicity	Completed First Semester of ADN Program			
	No		Yes	
	n	%	*n*	%
Hispanic	42	30.2	97	69.8
White	14	20.9	53	79.1
Black/African American	4	44.4	5	55.6
Other	3	42.8	4	57.1

Note: Cramér's V = .283, $p = .011$

Cross-tabulation of Race/Ethnicity with Retention to Second Semester after Boot Camp Participation in ADN Program

Race/Ethnicity	Retention to Second Semester of ADN Program			
	No		Yes	
	n	%	*n*	%
Hispanic	42	30.2	97	69.8
White	14	20.9	53	79.1
Black/African American	4	44.4	5	55.6
Other	3	42.8	4	57.1

Note: Cramér's V = .283, $p = .011$

Cross-tabulations of Financial Aid Status and First Semester Completion and Retention to Second Semester After Boot Camp Participation

Cross-tabulation of Financial Aid Status of Students Who Successfully Completed the First Semester after Boot Camp Participation in the ADN program.

Financial Aid Status	Completed First Semester of ADN Program			
	No		Yes	
	n	%	*n*	%
No	31	28.2	79	71.8
Yes	37	31.6	80	68.4
Total	68	30.0	159	70.0

Note: Cramér's V = .038, $p = .572$

Cross-tabulation of Financial Aid Status of Students Successfully Completing the First Semester after Boot Camp Participation in the ADN program.

Financial Aid Status	Retained to the Second Semester of ADN Program			
	No		Yes	
	n	%	*n*	%
No	31	28.2	79	71.8
Yes	37	31.6	80	68.4
Total	68	30.0	159	70.0

Note: Cramér's V = .038, $p = .572$