

A CORRELATIONAL STUDY OF A READING COMPREHENSION PROGRAM
AND ATTRITION RATES OF ESL NURSING STUDENTS IN TEXAS

by

WENDY DONNELL

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ABSTRACT

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Wendy Donnell, PhD

The University of Texas at Arlington, 2013

Supervising Professor: Barbara Raudonis

Decreasing the attrition rate of nursing students has become an important issue for programs in Texas as a means to alleviate the nursing shortage (Texas Higher Education Coordinating Board [THECB], 2009). Programs are admitting a more diverse group of students but attrition has historically been high among minority groups (Gilchrist & Rector, 2007). The purpose of this study was to examine the associations between English as a Second Language (ESL), a reading comprehension program, and attrition rates of nursing students. A secondary analysis of a large database which included nursing students from 27 initial licensure programs in Texas was completed. Jeffreys (2012) Nursing Undergraduate Retention and Success [NURS] model was used to guide the study.

Analysis of the logistic regression model identified that ESL was not predictive of attrition when controlling for age, race, gender, ethnicity, and first generation college student. Further analysis of ESL students using logistic regression indicated that students who used a reading comprehension program were almost twice as likely to be off track or out of the program as ESL students who did not use it.

Implications for nursing education include the need to evaluate student profile characteristics in a comprehensive way when determining which students are at risk of attrition. Replication of this study in other nursing student populations is recommended. Further research is also needed to evaluate interventions which could increase reading comprehension ability in ESL students.

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CHAPTER 1

INTRODUCTION

Registered nurses (RNs) are the largest profession in the largest industry, healthcare, in the United States (Buerhaus, Staiger, & Auerbach, 2009); however, the healthcare industry is currently experiencing a major shortage of RNs. This crisis is multifaceted and affects all areas of the industry. Most importantly, patient safety and quality of care are negatively affected (Gilchrist & Rector, 2007). It behooves all patient care stakeholders to work diligently to resolve this crisis and reduce the RN shortage.

Several factors contribute to the RN shortage, including an aging American population, an aging RN workforce, and an aging RN faculty (Buerhaus et al., 2009). One way to alleviate the RN shortage is by ensuring that students admitted to nursing programs successfully graduate and become members of the workforce. Nursing students who do not graduate with their admitting cohort result in a loss that can never be regained. This loss, or attrition, is a problem that has received much attention from people and organizations interested in healthcare. The ability to identify and intervene with students deemed at risk of attrition can be a valuable tool for increasing the RN workforce.

Chapter one includes a discussion of the background and significance of identifying and intervening with at risk nursing students. The conceptual model used to

guide this study will be described. The purpose of the study, the research questions, and the assumptions of the study will also be discussed.

Background and Significance

There are many factors contributing to the current shortage of RNs. First, the population in America is aging. The aging baby boomer generation is accelerating the growth of the elderly population (Buerhaus et al., 2009). More people are over the age of 65 than ever before (Werner, 2011). Over the last decade, the number of Americans older than 65 increased at a faster rate than the total population, and the number of persons between 85 and 94 years old increased by 29.9% from 2000 to 2010 (Werner, 2011). In fact, the number of people over age 65 will almost double over the next 25 years (Buerhaus et al., 2009). The increasing elderly population has a profound effect on the healthcare system. According to Buerhaus et al. (2009), the need for RNs stems from society's need for healthcare. They explained that an increase in the population of those ages 65 and over will lead to an increase in the need for healthcare and, more specifically, RNs. This is because more people will experience illnesses and will need and want the healthcare services required to prevent and treat these illnesses. As people age, their health often declines and healthcare services turn from treatment of acute illnesses to chronic and degenerative diseases, and community and long term care nursing will begin to outpace hospital nursing (Buerhaus et al.).

The second factor contributing to the nursing shortage is that RNs are aging, and there is a lack of younger RNs to fill vacant positions (Buerhaus et al., 2009). RN employment is expected to grow by 26% from 2010 to 2020 (Bureau of Labor

Statistics, 2012). Nationally, the average age of RNs is 44 years old and is projected to increase (Buerhaus et al., 2009). In Texas, the average age of RNs is 53 years old (Texas Higher Education Coordinating Board [THECB], 2009). Many RNs are also baby boomers, which is causing the RN population to age rapidly (Buerhaus et al., 2009). Buerhaus et al. (2009) predicted that a large shortage of RNs will occur by 2015 due to the retirement of baby boomer RNs. Unfortunately, the population of younger RNs is declining rather than increasing to compensate for the loss of retiring RNs (Buerhaus et al.).

The third factor contributing to the RN shortage is that there is a lack of RN faculty available to educate new RNs (Buerhaus et al., 2009; THECB, 2009). This is related to both an aging faculty population and lower salaries of faculty when compared to other RN positions (Buerhaus et al., 2009; Rosseter, 2012). The average age of nursing faculty ranked as any type of professor is 56.6 years (Rosseter, 2012). All but 5,000 of the nursing faculty in 2008 will be retired by 2023 (Buerhaus et al., 2009). Because boards of nursing restrict the number of students supervised by each faculty member, the biggest deterrent to increasing nursing student admissions is a lack of faculty (National League for Nursing [NLN], 2010). This faculty shortage results in denial of qualified nursing applicants and contributes to the continued nursing shortage (Buerhaus et al., 2009). About 147,000 qualified applicants were denied admission to baccalaureate (BSN) nursing programs in 2005 (Buerhaus et al., 2009). In Texas, 10,933 qualified applicants, or 41%, were denied admission to nursing programs in 2011 (Texas Center for Nursing Workforce Studies [TCNWS], 2012).

Once applicants are accepted into nursing programs, problems with attrition and retention of students become the focus for graduating new RNs. The NLN (2010) reports graduation rates of RN programs of approximately 80%. In Texas, the graduation rate is 69% according to the most current data available (THECB, 2009). Recognizing the loss that attrition causes, stakeholders in Texas recommended that nursing programs research and develop interventions to assist students in graduating and becoming successful RNs (THECB, 2009).

The consequences of attrition (delayed or non-completion) in a nursing program are not just deleterious to the individual student. A student might experience financial loss and psychological difficulty as a result of attrition; however, colleges and universities experience financial loss in the form of federal and state monies based on enrollment data. In 2007, the cost to the nation for first year higher education students who did not return for a second year was \$1.35 billion (Schneider, 2010). A logical conclusion would be that costs are considerably higher if students drop out in the third or fourth year when many BSN programs begin the nursing courses. When a student leaves a nursing program, the program cannot admit another student to replace the student who has left. Just as nursing programs cannot replace lost students, colleges and universities cannot regain the lost revenue caused by those same students.

Attrition also causes another qualified applicant to be denied admission to a program. The lost student garnered a place in the program only to lose it, but the other qualified applicant was never given a chance to succeed in the program. Within this context, the predictive value of admission requirements becomes highly significant.

Nursing programs want to admit the students who are most likely to succeed.

Implications for Texas

Texas claims six percent of the total number of RNs in the United States (THECB, 2009). Texas also has the second largest population in the nation (Werner, 2011). The state needs a large number of nurses not only to fill new positions resulting from the needs of an aging population but also to replace the large number of aging and retiring nurses. According to the TCNWS (2006), Texas needs to produce 25,000 new RNs by 2020 in order to meet the demand for nurses the state will need. The total number of RNs needed in the state makes resolving this current nursing shortage a priority for all healthcare stakeholders in Texas.

The 69% graduation rate in Texas is significantly lower than the national graduation rate and is more in line with the non-nursing national graduation rate (THECB, 2009). The financial implications for Texas related to student drop-outs are tremendous. From 2003 to 2008, Texas spent \$84,500,000 on student grants and appropriated \$386,000,000 for all first year college students who did not return (Schneider, 2010). This cost would be significantly higher for students who drop out later in their academic programs. The THECB (2009) has implemented strategies to increase enrollment in initial RN programs as well as improve the graduation rates from these programs. Monies have been spent on identifying and intervening with at-risk nursing students in Texas (THECB).

History of the Model for Identifying At Risk Nursing Students

Since 2003, East Texas nursing programs have partnered to identify students at risk of attrition and provide interventions to decrease that risk (Walker et al., 2011). The beginning grant “Advancing Nurses in East Texas” (ANET) included two associate degree (ADN) programs, one BSN program, and the area health education center (Chapman, 2012). Students were asked to complete an online survey which consisted of several parts, the Nursing Student Survey 1, the Nursing Student Survey 2, and the Student Perception Appraisal-1. The surveys measured demographic information and the students’ perceptions of academic preparation, family support, and personal qualities (Chapman, 2012). Students’ scores from the Nurse Entrance Test (NET) or the Health Education Systems, Incorporated entrance test (HESI) were also recorded. The status of each student at the end of every semester was recorded as on track, off track, or out of the program (Chapman, 2012). On track meant students were still with their original cohort. Off track meant students were not with their original cohort but still in the program. Out meant students were no longer in the program. In the study, off track and out were combined to yield a dichotomous variable, and a prediction model for at risk nursing students was developed (Chapman, 2012). NET scores were identified as a significant predictor of attrition rates in the study (G. Miller, personal communication, July 12, 2012).

The ANET study was expanded in 2007 with the “Nursing Education Consortium for East Texas Region 4” (NEC4) grant (Walker et al., 2011). The consortium consisted of nine nursing programs in the East Texas area. Students

completed the same survey initiated in the ANET grant. Researchers continued to improve the model predicting at risk nursing students (Walker et al., 2011).

Interventions to assist at risk students were also implemented. The researchers found that reading comprehension scores on entrance exams were the single most important predictor of student attrition; however, the interventions implemented were not specific to reading comprehension (Walker et al., 2011).

In 2009, the “Interventions with Re-Defined At Risk Nursing Students” (RDAR) grant tested a reading comprehension intervention using an online program (Chapman, 2012). This study involved 13 nursing programs from the East Texas area. The students completed the survey used in the previous two grants, the at risk prediction model was refined, and a reading comprehension intervention was introduced. Unfortunately, the reading comprehension program used in this study was not considered useful to nursing students and was ultimately judged as ineffective in alleviating attrition rates (G. Walker, personal communication, July 12, 2012).

The THECB, in recognizing the importance of this research to all Texas nursing programs, sponsored a grant, “Statewide At Risk Tracking and Interventions for Nurses” (SATIN) (Walker et al., 2011). This grant, involving 27 initial RN licensure nursing programs in Texas, continues the original survey from ANET but focuses more on interventions to prevent attrition of at risk students. The model for identifying at risk students continues to be refined. Preliminary data from the first year of the SATIN grant indicate that reading comprehension scores continue to be the single largest predictor of student attrition (G. Miller, personal communication, August 1, 2012). The data from

each of these grants have been maintained and analyzed by researchers at Stephen F. Austin State University (SFASU). The data have been analyzed both individually and in combination in order to develop an accurate model for identifying students at risk of attrition.

A subgroup of the nursing student population is those for whom English is not their first language (Brown, 2008). Although English might be a second, third, or fourth, language, these students are usually identified as English as a second language (ESL) students. Various authors have stated that ESL nursing students experience a higher attrition rate than non ESL students (Olson, 2012); however, there are no recent statistics to support this statement. The higher attrition rate of ESL students is an assumption and seems to be based on anecdotal evidence. Researchers cannot afford to assume that ESL students have higher attrition than non ESL students.

Since the ANET grant, data on ESL students in Texas have been collected; however, analysis of the factors that contribute to attrition of this subgroup of nursing students has not been done. Because of the findings related to reading comprehension from all of these grants, attention should be given to this specific group of students and implementation of a reading comprehension program. Actual statistics reflecting ESL nursing student attrition should be calculated so that these students can be identified early and interventions started before attrition occurs. Barriers which contribute to ESL student attrition and interventions designed to reduce them should be studied. ESL nurses are valuable healthcare providers for the American population. ESL nursing

students should be considered valuable future nurses who will strengthen the abilities of the RN profession.

Conceptual Model

The Nursing Undergraduate Retention and Success (NURS) model was developed in order to illustrate the relationships among multifaceted variables which affect nursing student retention and success (Jeffreys, 2012) (Figure 1). The NURS

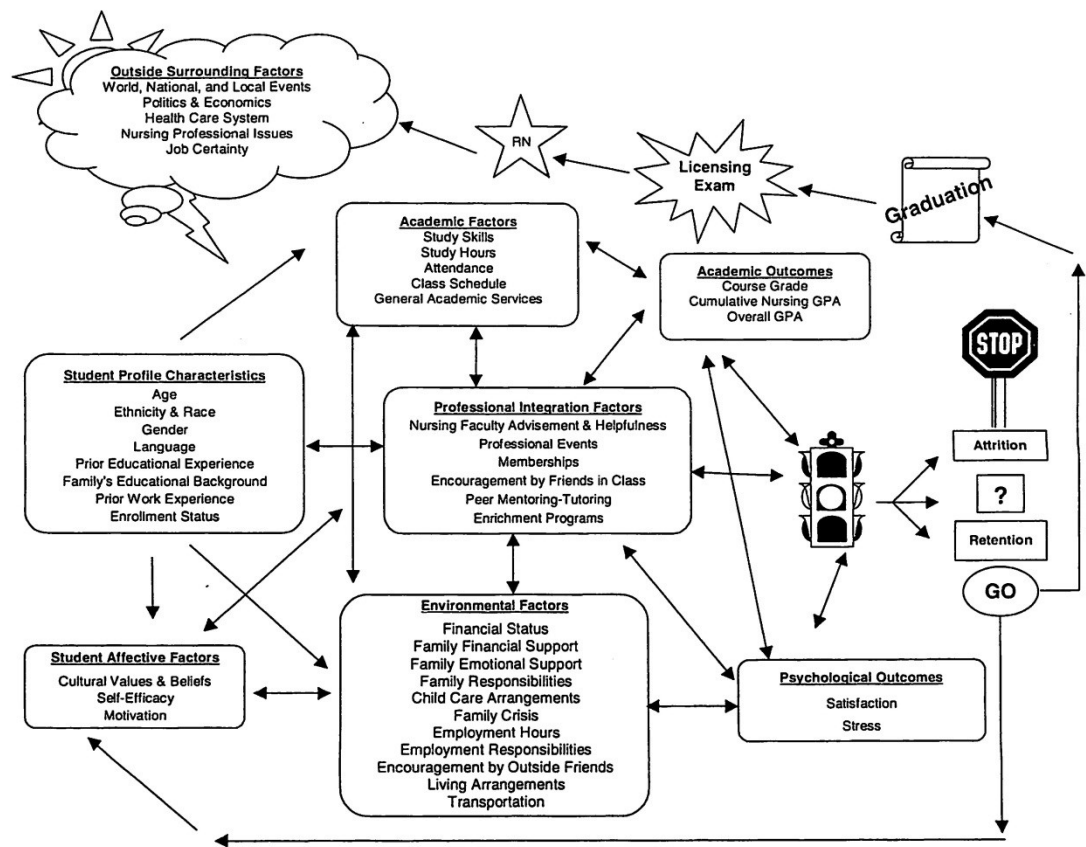


Figure 1. Jeffrey’s Model of Nursing Undergraduate Retention and Success.

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model depicts several factors which affect nursing student retention. These include student profile characteristics, student affective factors, environmental factors, academic factors, outside factors, and professional integration factors.

This model is useful for developing prescriptive strategies for retention and success of nursing students and suggests a positive view of student outcomes. The NURS model can also be used to guide studies focused on attrition and interventions to prevent it. ESL student attrition and factors associated with that attrition will be the focus of this study in an attempt to determine how ESL students could be retained in nursing programs. In this study, retention or attrition are the potential academic outcomes for each nursing student.

Jeffrey's NURS model is derived from several educational theories but, unlike these theories, focuses specifically on undergraduate nursing students (Jeffreys, 2007; Jeffreys, 2012). The model originally focused on nontraditional nursing students but was revised to incorporate both traditional and nontraditional students (Jeffreys, 2012). The current NURS model reflects the revisions made to incorporate both types of students. Regardless of which type of student is studied, Jeffreys (2007) emphasizes the importance of developing specific support strategies for each student based on variations in the NURS model factors.

This study tested the predictability of attrition rates based on ESL status when controlling for certain student profile characteristics, including age, ethnicity, race, gender, educational background, and first generation college student. The relationship between use of a reading comprehension program and attrition rates in ESL students

was also addressed. The NURS model has thus been modified for this study in order to focus on only selected concepts and their associated variables (Figure 2).

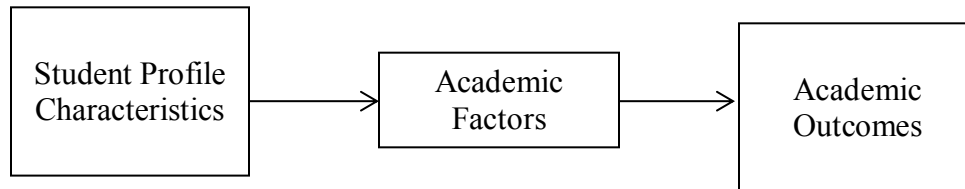


Figure 2. Donnell's Framework Based on the NURS Model.

The concepts from the framework guiding this study are defined in Table 1. The research variables related to the selected concepts are defined in Table 2. The operational definitions and data points for the variables are described in Chapter 3. As the model shows, each of the student profile characteristics affects academic outcome; however, the focus of this study will be on whether a reading comprehension program influences academic outcomes of students whose first language is not English.

Table 1. Conceptual Definitions from Donnell's Framework

Concepts	Definition
Student Profile Characteristics	Student characteristics prior to beginning a nursing program (Jeffreys, 2012)
Academic Factors	Elements related to the education experience that contribute to student performance in a nursing program
Academic Outcome	Semester status of student. Reported as student being on track, off track, or out of the program (attrition or retention of student)

Table 2. Concepts and Variable Definitions from Donnell's Framework

Concepts	Variable and Definition
Student Profile Characteristics	<i>Age</i> : The length of time a student has lived, expressed in years, when admitted into a nursing program <i>Ethnicity</i> : A group of people who share common cultural practices and traits, beliefs, traditions, and taboos <i>Race</i> : A group with similar physical characteristics or origin <i>Gender</i> : Male or female <i>First language</i> : Primary native use of spoken or written words to communicate <i>First Generation College Student</i> : Person who has never attended college and whose parents, siblings, spouse, significant other, children, or grandchildren have never attended college
Academic Factor	<i>Weaver Online Reading Program</i> : A program designed to increase a student's understanding of standard English language and vocabulary
Academic Outcome	<i>Attrition</i> : A student is no longer with the original admitting cohort

Purpose

The purpose of this retrospective, longitudinal correlational study was to examine the associations between language, a reading comprehension program, and attrition rates of nursing students. A secondary analysis of the THECB's database from the SATIN grant was conducted. This study examined the association of selected variables representing concepts in the NURS model. Although only a few of the variables representing the NURS model concepts were evaluated, this study added to the current body of evidence related to the model. The relationships between these variables are important in determining predictors of nursing student success.

Research Questions

The following research questions were addressed in this study using a large, retrospective sample of nursing students in initial licensure RN programs in Texas.

1. Is there an association between ESL status and attrition rates in nursing students in initial licensure programs in Texas?
2. Is there an association between participation in a reading comprehension program and attrition rates in ESL nursing students in initial licensure programs in Texas?

Assumptions

The following assumptions are incorporated within the conceptual framework and the study design.

1. Attrition of nursing students is a concern of nursing faculty.
2. Nursing students want to be successful.
3. Students at risk of attrition are interested in supportive strategies which could help increase student success.
4. ESL students would participate in a reading comprehension program in order to increase program success.

Chapter Summary

The information in this chapter provided an overview of the importance of conducting this research study. The background and significance of nursing student attrition was addressed. The conceptual model and resulting research framework of the

study were described. Concepts and variables were defined. The purpose of the study, the research questions, and assumptions were presented.

CHAPTER 2

CRITICAL REVIEW OF RELEVANT LITERATURE

Society's demand for better health has greatly influenced the need for RNs (Buerhaus et al., 2009). The majority of the US population places great value on good health and is willing to purchase healthcare services to improve health and quality of life (Buerhaus et al., 2009). These services are mainly provided by the largest occupation in healthcare, nursing. The current RN shortage has been caused by a confluence of events. The aging population, inability to increase RN graduates enough to meet demand, and the aging RN workforce will continue to direct this shortage (Buerhaus et al., 2009). A sidebar to the nursing shortage is nursing student attrition. If the attrition rate can be reduced, the nursing shortage could be decreased significantly. Unfortunately, federal agencies have not yet addressed the shortage and its implications (Aiken, 2007). As a result, several states have developed initiatives to address local shortages. By addressing the shortage on a state by state basis, it is possible that the national shortage could be alleviated (Buerhaus et al., 2009).

Chapter 2 will include a review of the literature regarding nursing student attrition. Literature related to attrition of ESL nursing students will also be presented. Finally, literature regarding interventions to reduce attrition of ESL students will be reviewed.

Relevant Literature

Nursing Workforce Diversity

A nursing workforce which reflects more closely the diversity of the US population results in better patient outcomes (Brown, 2008; Gilchrist & Rector, 2007). Only 9% of the nursing workforce, however, falls into ethnic or racial minority groups (Sullivan, 2004). This disparity between the population and the nursing workforce contributes to impaired access to health care (Sullivan, 2004).

The number of patients who do not speak English is rapidly increasing. In fact, two out of ten Americans speak a home language other than English (Sullivan, 2004). Patient outcomes and compliance rates are better when communication is in the patient's own language (Gilchrist & Rector, 2007). Ethnically diverse nurses can bridge these language barriers (Buerhaus et al., 2009; Olson, 2012). Unfortunately, ethnically diverse nursing students face serious challenges to graduating from nursing programs.

Nursing programs are focused on admitting students reflective of the increasingly diverse US population (Brown, 2008). Students from ethnic minority groups are more likely to be ESL students, so research to address nursing workforce diversity and ESL nursing student attrition will overlap (Brown, 2008). In fact, ESL student attrition has usually been a part of studies regarding minority student attrition, but ESL students experience language and cultural differences which the general minority population may not (Brown, 2008). Regardless of racial or ethnic background characteristics they may also have, ESL students should be studied as a separate subgroup (Brown, 2008).

National and International Prediction of Attrition of Nursing Students

Several studies have focused on the reasons for high attrition of nursing students. Until these reasons are clearly identified, the graduation rates will continue to remain low; however, as illustrated in the NURS model, the reasons students do not graduate are multifaceted and complex. The identification of students as at risk for attrition has been extremely difficult.

The factors contributing to the nursing shortage in the U.S. are also causing international nursing shortages (Salamonson, Andrew, Clauson, Cleary, Jackson, & Jacobs, 2011). Researchers in countries such as Australia, Canada, and the United Kingdom are focusing on nursing student attrition and its effect on nursing shortages in their countries (Jalili-Grenier & Chase, 1997; Prymachuk, Easton, & Littlewood, 2008; Salamonson et al., 2011). As in the U.S., many researchers from other countries in which English is the primary language have recognized the higher attrition of ESL nursing students and have begun to attempt to understand the factors which contribute to this (Donnelly, McKiel, & Hwany, 2009; Salamonson et al., 2011; Salamonson, Everett, Koch, Andrew, & Davidson, 2008; Weaver & Jackson, 2011).

In an attempt to predict which nursing students could be at risk of attrition, researchers have analyzed several factors. Some researchers have found that student characteristics such as age, gender, ethnicity, marital status, and hours worked were not predictors of attrition (Abele, Penprase, & Ternes, 2011; Uyehara, Magnussen, Itano, & Zhang, 2007). Other researchers found that age and ethnicity were predictors of nursing program success (Jeffreys, 2007). Pre nursing grade point averages (GPA) and scores

on nursing admission exams have been identified as predictors of attrition (Newton, Smith, Moore, & Magnan, 2007). These two variables have accounted for 35.9% of the variance in first semester nursing GPA (Newton et al., 2007). These same variables, however, have also been shown to not be predictive of attrition (Newton & Moore, 2009; Uyehara et al., 2007). Grades in specific courses, such as pathophysiology, and number of course failures have been identified as predictors of attrition (Abele et al., 2011; Uyehara et al., 2007). In one study, of students who did not complete the program, 48% had a C or lower in the pathophysiology course (Uyehara et al., 2007).

First semester nursing students have had higher attrition rates. For example, Jeffreys (2007) retrospectively studied a cohort of ADN students in New York to identify characteristics upon entry, during progression, through graduation, and ending with licensure. The overall attrition rate for this cohort was 25%. Of this 25%, 14% voluntarily withdrew, 9% failed in the first semester of nursing school, and 2% involuntarily withdrew. Jeffreys found that first semester nursing students have a higher attrition rate due to underestimating the demands of nursing school and overestimating their support system.

Prediction of Attrition of Nursing Students in Texas

In 2001, the Texas legislature passed the Nursing Shortage Reduction Act (Green et al., 2004). This act was intended to address the nursing shortage in two ways, nursing education and the nursing workforce environment. The act also encouraged nursing programs to create innovative strategies to retain students. The THECB (2009)

designed a competitive grant process titled the Nursing Innovation Grant Program to implement strategies outlined in the act.

In a 2009 THECB report, nursing programs were challenged to achieve an 85% pass rate on the NCLEX as well as an 85% graduation rate. The state provided incentive funding to programs which met the 85/85 goal. The THECB, through the Nursing Innovative Grant Program, awarded monies to programs focused on identifying and intervening with students to increase retention and graduation rates.

Researchers have studied both nursing students and nursing programs in Texas in an attempt to identify predictors of attrition and the methods which can decrease attrition rates (Higgins, 2005; Walker et al., 2011). According to Walker et al. (2011), the best predictor of attrition was the reading comprehension score on nursing admission exams. They found that students who were identified as at risk due to their reading comprehension score were 16% more likely to be off track than students not at risk. They also found that if a student was identified as at risk due to reading and also had other identified risk factors, that student's risk of attrition doubled. According to Higgins (2005), nursing programs in Texas use strict preadmission requirements to decrease attrition rates. After nursing students are admitted, remediation, counseling, and faculty assistance are used to increase student success (Higgins, 2005).

As these studies indicate, prediction of which nursing students are at risk of attrition is evolving. Generalization of results has been difficult. Identification of predictors of attrition has been inconsistent, and the rate of attrition is still around 50% (Newton & Moore, 2009). More research is needed to accurately determine the

predictors of attrition. Once these are known, nursing programs could use them in determining admission requirements as well as in the early identification of students at risk of attrition. If the attrition rate can be decreased, the disparity between nursing supply and demand could be reduced. In the meantime, nursing programs must continue to admit students who reflect the diverse population, including ESL students.

Prediction of Attrition of ESL Nursing Students

Historically, ESL students have experienced higher attrition than non-ESL students (Brown, 2008; Choi, 2005; Gilchrist & Rector, 2007; Junious, Malecha, Tart, & Young, 2010; Memmer & Worth, 1991; Scheele, Pruitt, Johnson, & Xu, 2011). Over 20 years ago, researchers identified the disparity between ESL and non-ESL nursing student attrition and began to devise ways to close the gap (Memmer & Worth, 1991), but actual attrition rates of ESL students have not been adequately measured and reported. Most researchers of this issue have accepted the disparity in attrition as a given and focused on barriers encountered by ESL nursing students and interventions to overcome them.

One quantitative study evaluated English language acculturation and its relationship to academic performance (Salamonson et al., 2008). In this Australian study, Salamonson et al. (2008) compared the English language acculturation scale scores of 273 ESL nursing students to performance in four nursing courses. They found a statistically significant positive relationship between the scores and student grades in all four courses. Age, sex, and hours spent in part time employment were not predictive of students' grades. Only language acculturation was identified as a significant predictor

of course grades. In another Australian study, being a native English speaker was the only significant predictor of course completion (Salamonson et al., 2011). Native English speakers were also twice as likely to complete the program in a shorter amount of time. Age, gender, marital status, employment, GPA, and nursing experience were not significant predictors of course completion.

Barriers to ESL Nursing Student Success

Overwhelmingly, English language fluency and communication have been identified as the biggest barriers to ESL nursing student success (Amaro, Abriam-Yago, & Yoder, 2006; Donnelly et al., 2009; Rogan, San Miguel, Brown, & Kilstoff, 2006; Sanner & Wilson, 2008). Language affects critical thinking as well as caregiving. Many ESL students are only fluent in conversational English and are not prepared for the technical English spoken in healthcare or the academic English needed in college (Starr, 2007). Starr (2007) concluded that language was the major obstacle for ESL students across all studies. ESL nursing students have identified language difficulty, including reading, writing, and verbal communication as a significant barrier to their program success (Amaro et al., 2006; Donnelly et al., 2009; Junious et al., 2010; Sanner & Wilson, 2008). ESL students have also identified difficulty with medical terminology as a barrier to program success (Rogan et al., 2006).

Clearly these studies indicate a link between ESL student success and fluency in the English language. Walker et al. (2011) identified a strong significant inverse relationship between reading comprehension scores and risk of attrition in nursing schools. It is imperative that nursing programs explore the overwhelmingly identified

barriers of language and communication and develop or explore interventions which alleviate the effects of these barriers on ESL nursing student attrition.

Interventions to Address Language Barriers experienced by ESL Nursing Students

Interventions to improve the English language skills of ESL nursing students have included writing programs, journals, study groups, oral presentations, individual tutoring, and linguistic modification of test items (Bosher & Bowles, 2008; Brown, 2008; Cunningham, Stacciarini, & Towle, 2004; Guhde, 2003; Jalili-Grenier & Chase, 1997; Weaver & Jackson, 2011). ESL students identified providing handouts, mentors, and tutoring as interventions which could reduce language and communication barriers (Amaro et al., 2006). The students thought tutoring in the student's primary language would also assist in program completion. Nursing faculty have identified formal ESL courses as an effective strategy for increasing English language fluency (Jalili-Grenier & Chase, 1997).

Prior to a writing workshop, ESL students reported difficulty with understanding nursing content in English and having difficulty with describing or explaining nursing content in written English (Weaver & Jackson, 2011). After completion of the workshop, the students expressed greater skills in referencing content correctly, focusing on important points, using evidence to support answers, developing clarity in their writing, and comprehending terminology definitions (Weaver & Jackson). After four individual tutoring sessions using a nursing shift report, an ESL student improved to 40% accuracy in recording essential information compared with 25% accuracy prior to the tutoring (Guhde, 2003). After implementation of journaling, oral presentations,

and increased class participation, the graduation rate of ESL students was the same but the NCLEX pass rate improved from 0% to 50% (Brown, 2008). After linguistic modification of test items, ESL students reported decreased complexity and increased comprehensibility of the exam, but they did not note any change in the content of the modified questions (Bosher & Bowles, 2008).

Memmer and Worth (1991) interviewed persons from all 21 baccalaureate programs in California to determine best practices to increase ESL student retention rates. The authors identified 30 retention approaches used by the programs. Those programs with the highest ESL retention rates used a greater number of the strategies than programs with lower ESL retention rates. Most of the programs required placement exams prior to admission. Remedial courses or English language acculturation time were identified as strategies for ESL student success. Other strategies included study skills workshops, mentoring programs, peer tutorials, counseling, advising, ESL participation in campus organizations, and early faculty intervention. The faculty of the programs with the highest ESL student retention rates reported that they focused on study skills, test-taking strategies, improvement of English language skills, and strong faculty commitment (Memmer & Worth).

America needs a more diverse nursing workforce which reflects the diversity of the population. It is clear from the literature that language and communication are the largest obstacles to ESL nursing student success. There is a paucity of research regarding interventions to increase fluency in the English language and how it could improve attrition rates. More research is needed concerning interventions that focus on

English language comprehension in all its forms and how these interventions relate to the attrition of ESL nursing students.

Chapter Summary

Information in Chapter 2 focused on a review of the literature regarding nursing student attrition rates. Literature related to attrition of ESL nursing students was also presented. Barriers to nursing school success and interventions focused on increasing English language fluency in ESL students were reviewed. A scarcity of research regarding interventions to increase English language fluency in ESL students was recognized.

CHAPTER 3

METHODS AND PROCEDURES

This chapter includes a description of the methods and procedures which were used to examine the associations between 1) ESL and attrition rates of nursing students in initial licensure programs in Texas and 2) a reading comprehension program and attrition rates of these ESL students. A secondary analysis was conducted using longitudinal data from the “Statewide At Risk Tracking and Intervention Program for Nurses” (SATIN) research database. SATIN is a proprietary database maintained by Stephen F. Austin State University (SFASU) researchers but owned by the Texas Higher Education Coordinating Board (THECB). The THECB has granted permission to use the SATIN database for this study (Appendix A).

Research Design

The research design was a secondary analysis using retrospective, longitudinal data in a correlational design. A correlational design enables researchers to determine the relationship between variables (Field, 2009). Advantages of a secondary analysis include the ability to answer research questions in less time and with lower cost (Doolan & Froelicher, 2009). Researchers can also answer questions without putting subjects at risk of adverse events (Doolan & Froelicher, 2009). Disadvantages of using secondary analysis are that the researcher has no control over the original method or measures used, variables may be defined or categorized differently, and the researcher does not know how the data collection actually occurred, how well it was done, or what the

response rate was for the original study (Doolan & Froelicher, 2009). The SATIN data collected during the first year of the program was used for this study.

Sample

In early 2011, the THECB accepted proposals for a Nurse Innovative Grant Program to study predictors of attrition and interventions to decrease the risk of attrition in Texas pre-RN licensure nursing programs. Twenty-seven initial RN licensure nursing programs applied for and received funds to participate in the program. Each of the 27 nursing programs is responsible for administering the survey, providing interventions to students, and reporting on the interventions and each student's status in the program at the end of each semester. If students are identified as at risk due to reading comprehension scores, the SFASU project manager provides to each student an access code to the Weaver reading program. The two year data collection period began June 1, 2011 and continues through May 31, 2013. Researchers at SFASU were responsible for developing the survey, interventions, and reporting forms as well as entering raw data into the database. The SFASU statistician is responsible for maintaining the database, identifying students at risk of attrition, and disseminating the information to each program about which of their students are at risk. Project directors at each pre-licensure nursing program are responsible for notifying students of their at risk status and making interventions available to students. The student is responsible for participating in group interventions, such as a simulation, and completing individual interventions, such as a reading comprehension program.

Students admitted to the participating pre-licensure nursing programs during the data collection period are given an opportunity to participate in the study. Students are grouped into cohorts based on the date of admission into the programs. Students admitted in June, 2011 will be followed for two years. Students admitted in January, 2013 will be followed for one semester.

The first year of data collection for the SATIN survey occurred between June, 2011 and May, 2012. Data from 3,305 students were obtained and entered into the database. The SFASU statistician reduced the sample due to incomplete data of students' status in the program. The final sample from the first year includes 3,258 pre-RN licensure nursing students over age 18 who attended one of 27 programs in Texas. Out of the 3,258 students, 2,611 are not ESL students and 529 are ESL students.

A power analysis using G*Power (Faul, Erdfelder, Buchner, & Lang, 2009) resulted in an estimated sample size for this study of 360. This estimation is based on a two-tailed test, $\alpha = .05$, power = .80, OR = 1.5, and $\Pr(Y=1|X=1)H_0 = 0.16$. The 0.16 is based on previous research using the same at risk model for Texas nursing students in which 15.3% to 17.3% of the students were identified as off track or out of the program (Walker et al., 2011).

Setting

The survey was administered to students at the campuses of the participating pre-licensure nursing programs. Students were usually taken as a group to a computer lab and directed to the survey website. The number of students in each group depended on the number of computers available in the lab. Students were instructed that if they

did not wish to participate in the study, they could use the computer to access the internet for any reason. Students remained in the computer lab as a group until all students indicated they were finished.

Measurement Methods

The SATIN survey is actually composed of four separate surveys, the nursing student survey 1 (NSS1), the nursing student survey 2 (NSS2), the student perception appraisal-1 (SPA-1), and the self-efficacy scale (SES) (Appendix B). The purpose of the SATIN survey is to collect information on each student regarding demographics, preadmission academic outcomes, perceptions of family and social support, and perceptions of personal qualities. Information from the survey is used to determine if a student should be considered at risk of attrition. Data concerning the students' status at the end of each semester are also collected from participating programs.

Administrator reports from the Weaver online reading program are also collected each semester from the Weaver website (Weaver Instructional Systems, Inc. [WIS], 2009).. The Weaver Reading Intervention program is an online program divided into two sections, reading comprehension and vocabulary. Weaver's philosophy is that students should be taught to comprehend before practice lessons and that new words should be learned through repetitive practice (WIS, 2009). For the SATIN grant, a medical terminology section was also added to the Weaver program. Students begin the Weaver program by taking a diagnostic exam. Based on results from the exam, the student's grade level is identified. The student then completes lessons and exams for

each level before advancing to the next level. Student progress is tracked by the Weaver program and is available for instructors and administrators of the software (WIS, 2009). The student profile characteristics, age, gender, ethnicity, race, first generation college student, and ESL, were drawn from the SATIN survey. Use of the reading comprehension program was taken from the Weaver administrator reports. Students' status in the program was taken from information reported by representatives from each participating nursing school. Operational definitions of the variables are in Table 3.

Ethical Considerations

Written permission to conduct the original SATIN study was obtained from the Institutional Review Board (IRB) at SFASU, the lead institution (Appendix C). Permission was obtained from the IRB at the University of Texas at Arlington for the secondary analysis (Appendix D). Informed consent was obtained from participants during the original data collection process. Students were informed that participation in the study could cause minor discomforts associated with completing a questionnaire. Benefits to the students included the possibility of success in the nursing program due to the interventions. Students were also informed that they would be free to withdraw from the study at any time and that refusal to participate would not negatively affect their standing in the program.

The database received from the SFASU statistician contained student names. After data from the Weaver administration report was entered into the database, all identifying information was deleted from the database, and the Weaver report was

Table 3. Conceptual and Operational Definitions of Study Variables

Study Variable	Conceptual Definition	Operational Definition
Age	The length of time a student has lived, expressed in years, when admitted into a nursing program	NSS1, Item #3 Age
Ethnicity	A group of people who share common cultural practices and traits, beliefs, traditions, and taboos	Checked No on NSS1, Item #12 Ethnic Origin
Race	A group with similar physical characteristics or origin	Checked No on NSS1, Item #13 Race
Gender	Male or female	Checked No on NSS1, Item #10 Gender
1 st Language	Primary native use of spoken or written words to communicate	Checked No on NSS1, Item #21 “Is English your first language?”
1 st Generation College Student	Person who has never attended college and whose parents, siblings, spouse, significant other, children, or grandchildren have never attended college	Checked No on NSS1, Item #16 “Are you the first person in our immediate family to attend college?”
Reading Program	Program used to increase standard English language comprehension	Identified in units of time on Weaver Administrator report each semester
Attrition	A student is no longer progressing through the nursing program with the original cohort	Identified as on, off, or out on semester status form

crosscut shredded. The database was stored in a password protected file on the primary investigator's (PI) password protected computer in a locked office. The database was downloaded into the statistical software program, Statistical Package for Social

Sciences (SPSS), and stored on the PI's computer. Only the PI had access to these files.

Three years after completion of the study, all files will be deleted.

Data Analysis

Statistical analysis was completed using SPSS version 21.0. Descriptive statistics were computed for age, gender, ethnicity, race, first generation college student, Weaver use, and ESL (Table 4). Missing values were analyzed to determine if they should be omitted from analysis. Categorical variables for logistic regression were coded as presented in Table 5.

Table 4. Template for Description of Sample from SATIN Database (n = 3,258)

Variable	Frequency/Percentage	Variable	Frequency/Percentage
<i>Gender</i>		<i>Ethnicity</i>	
Female	n (%)	Hispanic/Latino	n (%)
Male	n (%)	Non-Hispanic	n (%)
Missing	n	Missing	n
<i>ESL</i>		<i>Race</i>	
Yes	n (%)	White	n (%)
No	n (%)	Black/African American	n (%)
Missing	n	Asian	n (%)
<i>1st Generation College</i>		American Indian/Alaskan Native	n (%)
Yes	n (%)	Native Hawaiian/Other Specific Islander	n (%)
No	n (%)	Combination	n (%)
Missing	n	Missing	n
<i>Age</i>		<i>Weaver Use</i>	
Minimum	n	Yes	n
Maximum	n	No	n
Mean	n		
Standard Deviation	n		
Missing	n		

Table5. Regression Coding of Categorical Variables

Variables	Coded 0 Reference Categories	Other Codes
Gender	Female	Male = 1
Ethnicity	Non-Hispanic/Non-Latino	Hispanic/Latino = 1
English as a first language	Yes	No = 1
1 st Generation College Student	No	Yes = 1
Attrition	On Track	Off Track/Out of Program = 1
Race	White	Black = 1 Asian = 2 American Indian/Alaskan=3 Native Hawaiian/Other Islander= 4 Mixed = 5

Research Question #1

Is there an association between ESL status and attrition rates in nursing students in initial licensure programs in Texas?

Logistic regression was computed to answer research question #1. The Hosmer and Lemeshow test was computed to determine whether the model was a good fit for the data (Field, 2009). The Wald test and its significance level were examined for the ESL variable to determine its predictive quality on attrition after controlling for age, gender, ethnicity, race, and first generation college student (Field, 2009). Unadjusted and adjusted odds ratios were evaluated to examine the relationship between ESL and attrition (Osborne, 2012).

Research Question #2

Is there an association between participation in a reading comprehension program and attrition rates in ESL nursing students in initial licensure programs in Texas?

Logistic regression was computed to answer research question #2. Analysis included only ESL students. A model was created which identified the predictability of Weaver use on ESL student attrition after controlling for the student profile characteristics (age, gender, ethnicity, race, and first generation college student. The Hosmer and Lemeshow test was computed to determine whether the model was a good fit for the data (Field, 2009). The Wald test and its significance level were examined for the Weaver use variable to determine its predictive quality on ESL student attrition (Field, 2009). Odds ratios were evaluated to examine the association of Weaver use and ESL student attrition, after controlling for the covariates (Osborne, 2012).

Delimitations

The SATIN database includes only nursing students who consented to participate in the study and are from one of the 27 programs in Texas that received grant funding. The sample includes only students who completed more than the diagnostic test in the Weaver program. The initial diagnostic exam to determine student placement in the program can take approximately 10 minutes. Students who only completed the diagnostic exam but did not actually use the Weaver program were coded as not using it.

Chapter Summary

This chapter included a description of the methods and procedures which were used in this study. Characteristics of the SATIN study, setting, sampling plan, instruments, and data analysis were described. Ethical considerations and delimitations of the study were also addressed.

CHAPTER 4

FINDINGS

The results of a secondary analysis from the SATIN database are presented in this chapter. These results provided information regarding associations between nursing students' ESL status and attrition rates. Information was also gained concerning whether an association exists between a reading comprehension program and ESL nursing student attrition rates. The analysis included controlling for the variables age, gender, ethnicity, race, ESL status, Weaver use, and first generation college student.

Study Results

Sample Description

Study participants were selected from the SATIN database. The sample included students whose status in the program was documented at the end of the first year of data collection. The sample size was 3,258 nursing students in initial licensure programs in Texas. All 3,258 students reported gender, ethnicity, first generation college student, and English as a second language; however, only 3,123 students reported race and only 3,245 students reported age. Missing data were casewise deleted from the analyses because the data was considered missing at random and the sample size was large enough that statistical power was not significantly affected by deleting the cases (Howell, 2007). Further description of the sample is presented in Table 6.

Table 6. Description of Sample from SATIN Database (n = 3,258)

Variable	Frequency/Percentage	Variable	Frequency/Percentage
<i>Gender</i>		<i>Ethnicity</i>	
Female	2714 (83.3%)	Hispanic/Latino	736 (22.6%)
Male	544 (16.7%)	Non-Hispanic	2522 (77.4%)
Missing	0	Missing	0
<i>ESL</i>		<i>Race</i>	
Yes	529 (16.2%)	White	2231 (68.5%)
No	2729 (83.8%)	Black/African American	530 (16.3%)
Missing	0	Asian	277 (8.5%)
<i>1st Generation College</i>		American Indian/Alaskan Native	27 (0.8%)
Yes	921 (28.3%)	Native Hawaiian/Other Specific Islander	15 (0.5%)
No	2237 (71.7%)	Combination	43 (1.2%)
Missing	0	Missing	135 (4.1%)
<i>Age (Original Continuous Variable)</i>			
Minimum	18		
Maximum	72		
Mean	28.3		
Standard Deviation	8.652		
Missing	13		

Research Question #1

Is there an association between ESL status and attrition rates in nursing students in initial licensure programs in Texas?

H₀: There is no association between ESL status and attrition rates in nursing students in initial licensure programs in Texas.

The sample was divided according to the outcome variable, on track or off track/out of the program. Of the total number of students, 2,611 were on track and 647 were off track or out of the program. Of the students who were on track, 14.7% were ESL students and 85.5% were non ESL students. Of the off track/out of the program students, 22.6% were ESL students and 77.4% were non ESL students. Baseline characteristics of the two groups are listed in Table 7.

The assumption of linearity was violated by the continuous variable, age, so it was transformed into a nominal variable and coded as 18 to 25 years = 0 (reference category), 26 to 30 years = 1, 31 to 35 years = 2, 36 to 40 years = 3, 41 to 45 years = 4, 46 to 50 years = 5, and 51 years and older = 6. Codes for the other dichotomous variables are presented in Table 5.

Unadjusted odds ratios were calculated for each of the variables. Students who were off track or out of the program were more likely than on track students to be older. For example, students age 46 and older were 2.5 times more likely to be off track or out of the program than younger students (OR = 2.581, 95% CI 1.837 to 3.625, $p < .0001$). Black students were over 1.5 times more likely to be off track or out of the program than White students (OR = 1.773, 95% CI 1.423 to 2.208, $p < .0001$). Male students were almost 1.5 times more likely to be off track of out of the program than female students (OR = 1.455, 95% CI 1.172 to 1.806, $p = .001$). First generation college students were 1.3 times more likely to be off track or out of the program than those who

Table 7. Comparison of characteristics of students on track and off track/out.

Variable	On Track (n = 2611)	Off Track/Out of Program (n = 647)
Age (yrs) (n = 3245)	27.89 ± 8.3	29.98 ± 9.9
18-25 years	1339 (51.5%)	283 (44.0%)
26-30 years	454 (17.4%)	102 (15.9%)
31-35 years	333 (12.8%)	86 (13.4%)
36-40 years	218 (8.4%)	63 (9.8%)
41-45 years	148 (5.7%)	49 (7.6%)
46+ years	170 (5.8%)	60 (9.3%)
Ethnicity (n = 3258)		
Not Hispanic	2027 (77.6%)	495 (76.5%)
Hispanic	584 (22.4%)	152 (23.5%)
Race (n = 3123)		
White	1837 (73.5%)	394 (63.3%)
Black	384 (15.4%)	146 (23.5%)
Asian	209 (8.4%)	68 (10.9%)
American Indian/Alaskan	24 (1.0%)	3 (0.5%)
Native Hawaiian/Other Islander	9 (0.4%)	6 (1.0%)
Mixed	38 (1.5%)	5 (0.9%)
1 st Generation College Student (n = 3258)		
No	1902 (72.8%)	435 (67.2%)
Yes	709 (27.2%)	212 (32.8%)
Gender (n = 3258)		
Female	2204 (84.4%)	510 (78.8%)
Male	407 (15.6%)	137 (21.2%)
English as 1 st Language (n = 3258)		
No	383 (14.7%)	146 (22.6%)
Yes	2228 (85.3%)	501 (77.4%)
Weaver Use (n = 3258)		
No	2506 (96.0%)	590 (91.2%)
Yes	105 (4.0%)	57 (8.8%)

were not first generation college students (OR = 1.307, 95% CI 1.086 to 1.574, $p =$
.005). ESL students were over one and a half times more likely to be off track or out of

the program than non ESL students (OR = 1.695, 95% CI 1.369 to 2.099, $p < .0001$).

Ethnicity was not a significant predictor of attrition.

The association of ESL to attrition when controlling for other baseline variables (age, gender, ethnicity, race, and first generation college student) was evaluated using logistic regression. Variables were simultaneously entered into the model. The overall predictive model was a good fit for the data as evidenced by the Hosmer and Lemeshow test ($\chi^2 = 3.110$, $df = 8$, $p = .927$). ESL was not a significant predictor of attrition (OR = 1.287, 95% CI .992 to 1.671, $p = .058$) when controlling for age, ethnicity, race, gender, and first generation college student. Unadjusted and adjusted odds ratios for each variable are given in Table 8.

Table 8. Association between Characteristics and Attrition of Total Sample

Variable	Odds Ratio (unadjusted)	<i>p</i> Value	Odds Ratio (adjusted)	<i>p</i> value
Age		< .0001		< .0001
18-25 years	1.000		1.000	
26-30 years	1.063	.632	.974	.845
31-35 years	1.222	.145	1.142	.349
36-40 years	1.367	.047	1.225	.215
41-45 years	1.566	.011	1.335	.117
46+ years	2.581	<.0001	2.354	<.0001
Ethnicity				
NonHisp/NonLat	1.000		1.000	
Hispanic/Latino	1.066	.540	1.256	.068
Race				.006
White	1.000		1.000	
Black	1.773	<.0001	1.759	<.0001
Asian	1.517	.006	1.362	.078
American Indian/Alaskan	.583	.380	.662	.443
Native Hawaiian/ Other Islander	3.108	.032	2.949	.045
Mixed	.613	.308	.665	.397
English 1 st Language				
Yes	1.000		1.000	
No	1.695	<.0001	1.288	.058
Gender				
Female	1.000		1.000	
Male	1.455	.001	1.418	.003
1 st Generation College Student				
No	1.000		1.000	
Yes	1.307	.005	1.267	.019

Research Question #2

Is there an association between a reading comprehension program and attrition rates in ESL nursing students in initial licensure programs in Texas?

H₀: There is no association between a reading comprehension program and attrition rates in ESL nursing students in initial licensure programs in Texas.

The SATIN sample was divided into ESL students and non ESL students in order to answer research question #2. Characteristics of the ESL sample are given in Table 9. ESL students were divided according to the outcome variable, on track and off track/out of the program (Table 10). Of the total number of ESL students, 383 were on track and 146 were off track or out of the program. Of the ESL students who were on track, 9.7% used the Weaver reading program and 90.3% did not use Weaver. Of the off track/out of the program students, 17.1% used Weaver and 82.9% did not use Weaver.

Unadjusted odds ratios were calculated using logistic regression for each of the variables. Age was coded as in Research Question #1. Other variables were coded as described in Table 5. ESL students age 46 and over were almost three and a half times more likely to be off track or out of the program than younger ESL students (OR = 3.396, 95% CI 1.540 to 7.491, $p = .002$). ESL students who used Weaver were almost twice as likely to be off track or out of the program than ESL students who did not use Weaver (OR = 1.932, 95% CI 1.117 to 3.342, $p = .019$). There were no significant differences in ethnicity, race, gender, and first generation college student between the two groups.

Table 9. Characteristics of ESL Sample from SATIN Database (n = 529)

Variable	Frequency/Percentage	Variable	Frequency/Percentage
<i>Gender</i>		<i>Ethnicity</i>	
Female	411(77.7%)	Hispanic/Latino	208 (39.3%)
Male	118 (22.3%)	Non-Hispanic	321 (60.7%)
Missing	0	Missing	0
<i>1st Generation College</i>		<i>Race</i>	
Yes	207 (39.1%)	White	178 (33.6%)
No	322 (60.9%)	Black/African American	131 (24.8%)
Missing	0	Asian	166 (31.4%)
<i>Weaver Use</i>		American Indian/Alaskan Native	2 (0.4%)
Yes	62 (11.7%)	Native Hawaiian/Other Specific Islander	5 (0.9%)
No	467 (88.3%)	Combination	1 (0.2%)
Missing	0	Missing	46 (8.7%)
<i>Age</i>			
Minimum	19		
Maximum	56		
Mean	29.72		
Standard Deviation	8.614		
Missing	3		

Table 10. Comparison of characteristics of ESL students on track and off track/out.

Variable	On Track (n = 383)	Off Track/Out of Program (n = 146)
Age (yrs) (n = 526)		
<i>18-25 years</i>	168 (44.1%)	53 (36.6%)
<i>26-30 years</i>	73 (19.2%)	25 (17.2%)
<i>31-35 years</i>	54 (14.2%)	22 (15.2%)
<i>36-40 years</i>	45 (11.8%)	11 (7.6%)
<i>41-45 years</i>	27 (7.1%)	19 (13.1%)
<i>46+ years</i>	14 (3.7%)	15 (10.3%)
Ethnicity (n = 529)		
<i>Not Hispanic</i>	223 (58.2%)	98 (67.1%)
<i>Hispanic</i>	160 (41.8%)	48 (32.9%)
Race (n = 483)		
<i>White</i>	138 (39.5%)	40 (29.9%)
<i>Black</i>	86 (24.6%)	45 (33.6%)
<i>Asian</i>	120 (34.4%)	46 (34.3%)
<i>Other</i>	39 (10.2%)	15 (10.3%)
1 st Generation College Student (n = 529)		
<i>No</i>	233 (60.8%)	89 (61.0%)
<i>Yes</i>	150 (39.2%)	57 (39.0%)
Gender (n = 529)		
<i>Female</i>	299 (78.1%)	112 (76.7%)
<i>Male</i>	84 (21.9%)	34 (23.3%)
Weaver Use (n = 529)		
<i>No</i>	346 (90.3%)	121 (82.9%)
<i>Yes</i>	37 (9.7%)	25 (17.1%)

Logistic regression was calculated to determine the association between Weaver use and attrition in ESL students when controlling for age, ethnicity, race, gender, and first generation college student. Variables were loaded into the regression model using forced entry. The model was a good fit for the data as indicated by the Hosmer and Lemeshow test ($\chi^2 = 3.216$, $df = 7$, $p = .864$). Weaver use was a significant predictor of ESL student attrition (OR = 2.155, 95% CI 1.169 to 3.975, $p = .014$) independent of

age, ethnicity, race, gender, and first generation college student. Unadjusted and adjusted odd ratios for each variable are given in Table 11.

Table 11. Association between Characteristics and Attrition for ESL Students

Variable	Odds Ratio (unadjusted)	<i>p</i> Value	Odds Ratio (adjusted)	<i>p</i> Value
Age		.014		.025
18-25 years	1.000		1.000	
26-30 years	1.086	.770	1.010	.973
31-35 years	1.291	.391	1.180	.593
36-40 years	.775	.492	.736	.418
41-45 years	2.231	.018	1.967	.054
46+ years	2.536	.063	3.236	.005
Ethnicity				
NonHisp/NonLat	1.000		1.000	
Hispanic/Latino	.683	.062	.619	.278
Race		.152		.618
White	1.000		1.000	
Black	1.805	.022	1.172	.726
Asian	1.323	.263	.964	.934
Other	1.327	.423	1.493	.273
Weaver Use				
No	1.000		1.000	
Yes	1.932	.019	2.290	.005
Gender				
Female	1.000		1.000	
Male	1.081	.738	.978	.929
1 st Generation College Student				
No	1.000		1.000	
Yes	.995	.979	1.143	.534

Chapter Summary

This chapter included a description of the data analyses to identify the associations between ESL, Weaver usage, and attrition. The sample consisted of 3,258 nursing students in initial licensure programs in Texas. Descriptions of the total sample and the ESL student sample were given. Unadjusted and adjusted odds ratios were presented for each variable. Logistic regression models were computed to answer research questions #1 and #2. After controlling for age, gender, ethnicity, race, and first generation college student, being an ESL student was not a significant predictor of attrition. Using the Weaver reading program was a significant predictor of ESL student attrition, after controlling for age, gender, ethnicity, race, and first generation college student.

CHAPTER 5

DISCUSSION

A discussion of the results of secondary analysis of the SATIN database is presented in this chapter. Interpretations of the major findings of the study are discussed within the context of current research findings and the study's research framework. In addition, study limitations, conclusions, implications, and recommendations for future research are presented.

Interpretation of Major Findings

Representativeness of Sample

This study included a larger (3, 258 participants), more heterogeneous (27 initial licensure programs) sample of nursing students than what had been found in the literature to date (Jeffreys, 2007; Salamonson et al, 2007; Uyehara et al., 2007). The sample characteristics of age and gender were similar to those reported in the literature (Fowler & Norrie, 2009; Jeffreys, 2007; Walker et al., 2011). The racial and ethnic composition of the sample is consistent with that of the current Texas and U.S. RN workforce (Buerhaus et al., 2009; Texas Board of Nurses [BON], 2013). The racial and ethnic disparity that exists between the RN population and the general population will continue, based on this sample. The race and ethnicity categories of the sample compared to the race and ethnicity categories of the Texas and U.S. populations highlight the differences between nursing student composition and the general

population (U.S. Census Bureau, 2013). See Table 12. This comparison supports the need for continued focus on the recruitment and retention of nursing students from diverse ethnic and racial backgrounds.

Table 12. Comparison of Sample to Texas and U.S. Populations

Variable	Sample	Texas Pop.	U.S. Pop.
Ethnicity			
<i>Non Hispanic</i>	77.4%	44.8%	63.4%
<i>Hispanic/Latino</i>	22.6%	38.1%	16.7%
Race			
<i>White</i>	68.5%	80.9%	78.1%
<i>Black</i>	16.3%	12.2%	13.1%
<i>Asian</i>	8.5%	4.0%	5.0%
<i>American Indian/Alaskan Native</i>	0.8%	1.0%	1.2%
<i>Native Hawaiian/Other Islander</i>	0.5%	0.4%	0.2%

Research Question #1

Is there an association between ESL status and attrition rates in nursing students in initial licensure programs in Texas?

Initially, the analysis of the individual student profile characteristics (age, gender, race, ethnicity, ESL, and first generation college student) indicated significant unadjusted odds ratios between race, gender, age, ESL, and first generation college student and attrition. Students who were off track or out of the program were more likely to be older, male, ESL, first generation college students, and Black, Asian, or Native Hawaiian/Other Islander, than the students who were on track. This is consistent with what has been reported in the literature, in which several combinations of the

effect of these variables on student attrition have been evaluated (Abele et al., 2011; Jeffreys, 2007; Salamonson et al., 2008; Salamonson et al., 2011; Uyehara et al., 2007).

In this study, student profile characteristics were also analyzed as a group using logistic regression to determine significant predictors of attrition. ESL status and its association with attrition, independent of the other student profile characteristics, was of primary interest. Analysis of the model did not identify a significant association between students' ESL status and attrition. The only significant predictors of attrition were age over 46, Black or Native Hawaiian/Other Islander, male, or first generation college student. These results are important because no study found in the literature to date has evaluated the synergist effects of all of the student profile characteristics on attrition.

Research Question #2

Is there an association between a reading comprehension program and attrition rates in ESL nursing students in initial licensure programs in Texas?

To answer this question, the database was divided into ESL students and non ESL students. Use of a reading comprehension program (Weaver) was added as a variable. Analysis of the individual student profile characteristics (age, gender, race, ethnicity, first generation college student, and Weaver use) for ESL students indicated significant correlations between age and attrition and between Weaver use and attrition. ESL students who were off track or out of the program were more likely to be over age 46 and use the Weaver program than ESL students who were on track. No literature to

date has evaluated the student profile characteristics and their relationship to attrition in ESL students.

Student profile characteristics were also analyzed as a group using logistic regression to determine significant predictors of attrition of ESL students. Use of the Weaver program and its association with attrition, independent of the other student profile characteristics, was of primary interest. Analysis of the model did identify a significant association between Weaver use and attrition in ESL students. The only other significant predictor of attrition was age over 46.

Students who used the Weaver reading program had been identified as at risk of attrition based on their reading comprehension scores. The literature has shown that the riskiest students are those with low reading comprehension scores (Walker et al., 2011). A conclusion based on these results is that the Weaver program is not a viable intervention for decreasing student attrition. A possible explanation is that the students who used the Weaver program were at such a high risk of attrition that even use of the program could not significantly decrease their attrition risk enough. The Weaver reading program was initiated in the first semester of nursing school. Students beginning a nursing program typically underestimate the demands placed on them at that time (Jeffreys, 2007). It is possible that students were not able to maximize use of the Weaver reading program.

Findings related to NURS Model

This study evaluated the effects of student profile characteristics, age, ethnicity, race, gender, first generation college student, and ESL status on attrition. Findings

support Donnell's Research Framework in which student profile characteristics affect academic outcomes (Figure 2). The study findings also support the NURS model which indicates an association between student profile characteristics and academic outcomes (Figure 1). The results from research question #2 supported the association between student profile characteristics, academic factors, and academic outcomes. This is consistent with both Donnell's Research Framework and the NURS model.

Study Limitations

Limitations of a secondary analysis include the inability of the researcher to have control of the questions which are asked. For example, the SATIN database included race and ethnicity as two separate categories which follows the mandate of the Office of Management and Budget and is used by the U.S. Census Bureau (U.S. Census Bureau, 2013). Comparisons of race and ethnicity in the SATIN database to those in other studies were also difficult due to differences in definitions (Jeffreys, 2007; Loftin, Newman, Bond, Dumas, & Gilden, 2012; Uyehara et al., 2007).

Pre-licensure nursing programs report attrition rates ranging from 25% to 33% (Jeffreys, 2007; Prymachuk et al., 2008; Uyehara et al., 2007). The overall attrition rate for the sample of this study was 19.9% and included 27 nursing programs. One limitation of the study was the implementation of the Weaver reading program during the first year of the SATIN grant which may have affected the attrition rate of the sample. Walker et al. (2011) reported an attrition rate of 15% to 17% after their interventions to decrease attrition were implemented.

The SATIN database includes Texas nursing programs whose administrators applied for and received a grant focused on decreasing attrition rates. These programs were highly motivated to decrease attrition rates which may have resulted in a biased sample. The sample of the study was large enough and had adequate power to answer the research questions. The study findings contribute new evidence to the literature concerning ESL students, a reading comprehension program, and attrition.

Conclusion

In analyzing student profile characteristics that contribute to nursing student attrition, study results support using multiple characteristics (age, race, ethnicity, gender, ESL status, and first generation college student) for prediction of attrition. The important finding was the synergy that occurred between the six variables evaluated in the model. These interactions support the complexity of student attrition in nursing programs and provide evidence supporting the NURS model (Jeffreys, 2012). Poor reading comprehension has been identified as a major barrier to the successful completion of initial licensure nursing programs by ESL students (Amaro et al., 2006; Donnelly et al., 2009; Sanner & Wilson, 2008). A reading comprehension program alone may not be able to surmount the synergistic effect of multiple student profile characteristics on ESL student attrition. Analysis of the model suggests that new interventions to improve the reading comprehension of ESL students are needed. These interventions need to be theory based, responsive to the individualized needs of ESL students and validated with large, diverse samples.

Researchers evaluating the effects of race and ethnicity on nursing student attrition should come to a consensus on how these variables are defined. Until then, meta-analysis and generalization of results will be problematic. Interventions to assist nursing students who are part of racial and ethnic minorities cannot begin until researchers know exactly who these students are.

Implications for Nursing

These findings can have an important impact on nursing education. The study findings reveal the importance of evaluating a combination of factors when determining students who are at risk of attrition. The findings also highlight the possible need for early identification of students at risk of attrition due to reading comprehension scores so that interventions can begin prior to the start of nursing school. Nursing faculty need to comprehensively evaluate student profile characteristics in order to determine specific interventions for each student. These findings clearly demonstrate that prediction of students at risk of attrition is a complex process.

Future Research

Replication of this study, using the at risk prediction model and a comprehensive approach to evaluating student profile characteristics, is critical for generalizability of these results. Further research is also needed which evaluates interventions to improve the reading comprehension of ESL students. Research in nursing education would benefit from using consistent definitions for categories such as race and ethnicity. One suggestion is to use the U.S. Census Bureau categories to define

these variables. This type of consensus would permit future meta-analyses and collaboration between researchers.

Chapter Summary

This chapter included a discussion of the findings of this study, within the context of current literature. Study limitations, conclusions, and implications for nursing education were also described. In addition, recommendations for future research were presented.

APPENDIX A

PERMISSION TO USE DATABASE FROM THE TEXAS HIGHER EDUCATION

COORDINATING BOARD

Student Information Disclosure Agreement ("Agreement") between
Texas Higher Education Coordinating Board ("THECB") and Wendy Donnell
("REQUESTER")

Parties to the Agreement

The parties to this Agreement ("Parties") include:

- (1) Texas Higher Education Coordinating Board ("THECB")
1200 East Anderson Lane
Austin, Texas 78752

And

- (2) Wendy Donnell ("REQUESTER")
PO Box 6156 SFA Station
Nacagdoches, TX 75962
Email: wldonnell@sfasu.edu
Phone: 936-468-7727

Purpose of the Disclosure

THECB agrees to provide the following personally identifiable information from student education records ("student information"), which is protected under the Family Educational Rights and Privacy Act ("FERPA"), 20 U.S.C. 1232g:

SATIN database individual survey results, time spent in reading comprehension program, and semester status for the first year. The SATIN research project involves 27 nursing programs across Texas. Students complete an online survey and faculty provide the student's status in the program at the end of each semester. The Weaver reading comprehension program is accessed by students. Researchers at SFASU document students' time in the Weaver program.

To REQUESTER for the sole purpose(s) of:

Performing a secondary analysis of the data to determine if relationships exist between being an English as a Second Language (ESL) student and attrition rate in a nursing program. Any relationship between a reading comprehension program and ESL attrition rates will also be evaluated. Data will only be reported in aggregate form.

Authorization

The Parties agree and understand that this Agreement is to be strictly construed to comply with FERPA. The Parties ensure that the disclosure of all student information under this Agreement is released in accordance with 34 CFR § 99.33(b)(1). The Parties confirm that THECB initially received the requested student information from an educational agency or institution with the understanding that THECB could further redisclose the information on behalf of the educational agency or institution.

THECB, a State educational authority, hereby designates REQUESTER as its authorized representative pursuant to 34 CFR § 99.35(a)(3). REQUESTER, as an authorized representative of THECB, shall use all student information disclosed under this Agreement in connection with an audit or evaluation of higher education instruction, a Federal - and State-supported education program, under 34 CFR § 99.35(a)(1). The Parties confirm that the REQUESTER has a legitimate interest in the audit or evaluation of higher education instruction pursuant to 34 CFR § 99.35(a)(3)(v).

Terms of the Disclosure

At a minimum, the following terms and conditions will apply to all student information disclosed by THECB to REQUESTER under this Agreement:

- (1) The student information submitted to REQUESTER by THECB is confidential and shall be used only for the purpose(s) stated in this Agreement. REQUESTER shall observe the following procedures to monitor and protect the confidentiality of student information:

All data will be stored on a password protected computer behind a locked office door. Data on a flash drive will be locked in a desk drawer. After analysis, individual subjects' information will be deleted from requester's files with the understanding the research team at SFASU will maintain the data in the original database.

- (2) REQUESTER agrees not to share or disclose this data with any third-party outside of the purpose(s) stated in this Agreement, unless required to do so by law or other agency regulations.
- (3) Failure to comply with the requirement not to release information, except for the sole purpose(s) stated within this Agreement, will result in cancellation of this Agreement. REQUESTER will also lose eligibility to receive any student information from THECB for a period of not less than five (5) years. REQUESTER understands that failure to observe the restrictions in this Agreement may also constitute a "Breach of Computer Security" as defined in the Texas Penal Code, Chapter 33, Sec. 33.02, and that such an offense constitutes a criminal offense.
- (4) To the extent allowed by law, REQUESTER agrees to indemnify and hold THECB harmless for any loss, cost, damage or expense suffered by THECB as a direct result of REQUESTER's failure to comply with the requirement not to release information, except for the sole purpose(s) stated in this Agreement.
- (5) THECB shall maintain a record of the disclosure under this Agreement pursuant to the requirements of 34 CFR § 99.32(b)(2).
- (6) REQUESTER shall destroy all student information disclosed under this Agreement when it is no longer needed by Institution for the purpose(s) outlined in this Agreement within 120 days.
- (7) REQUESTER shall promptly notify THECB of any security breach that results in unauthorized access to any student information.
- (8) The Parties agree to amend this Agreement as necessary to comply with applicable amendments to FERPA.

Parties' Signatures: Hendy Donnell
Signature of Requester

2/18/13
Date

Approved by: [Signature]
Assistant Commissioner, THECB

2/28/13
Date

[Signature]
General Counsel, THECB

2/28/13 *

[Signature]
Deputy Commissioner, THECB

3/5/13
Date

* See e-mail attached hereto.

APPENDIX B

SURVEY AND CONSENT FORM FOR SATIN RESEARCH STUDY

Welcome to the Nursing Student Support program. This program is funded by the Texas Higher Education Coordinating Board (THECB), Nursing Innovation Grant. Twenty seven nursing programs throughout Texas are a part of this grant. The Deans/Directors, faculty, and staff of the program have joined together in an effort to make your educational experience in our nursing programs successful and rewarding. Nursing curricula are difficult and, at times, stressful. In fact, data indicates that approximately 31% of students who enter nursing programs do not graduate. This program is dedicated to reducing that number in Texas and helping you walk across the stage at graduation into a rewarding nursing career.

As a part of the grant, we are asking you to complete various surveys which will help us identify those that may need additional support as you pursue your nursing degree. There are four surveys that together should take no longer than thirty minutes to complete. All questions are important to us, so please answer each question with your initial response. Understand that there are no right or wrong answers on three of the four surveys. In the future, you may receive information to refer you to additional support activities. One of these additional activities is a support website that can be accessed at www.nursingstudentsupport.net. This website includes personal solutions, course life lines and study aid modules that are free to you to use at any time. We want you to be successful, so please use all of the resources that we are placing in your hands and feel free to contact us if you have questions.

Thank you, Deans and Directors of Participating Nursing Programs and Stephen F.
Austin State University Grant Team

Nursing Student Survey 1

Dear Nursing Student,

You are being asked to participate in a study which focuses on identifying factors which help students successfully complete nursing programs. This study is funded by the Texas Higher Education Coordinating Board under the Nursing Innovation Grant program. It involves 27 nursing programs throughout the state of Texas. Participation in the study includes completion of four surveys which will take approximately 20-30 minutes. The surveys ask questions regarding your academic preparation and success, demographic questions, your support network, and beliefs about life style choices. For example, one survey will ask for your entrance examination scores, and another will ask you to evaluate your motivation relating to obtaining goals.

Agreeing to participate in this study gives us permission to use survey results to identify if additional support related to the academic, background, or environmental variables is needed. If the survey results show that participation in a specific activity such as a reading comprehension program or other specific activities, you will then be given access to these support tools.

Your participation in this evaluation study is expected to occur over a 24 month period. The research team along with your program director will be monitoring your activity and progression throughout the nursing curriculum.

As a part of a prior study funded by THECB, there is a web site which contains information that may help you academically or personally. The web site is located at www.nursingstudentsupport.net and you are free to utilize any of the links contained in

the web site. While the schools of nursing and research team will have identifying information, this information will be limited to the research team and the individuals at your program responsible for assigning and tracking your progression throughout the program. All of the reports at the end of the study will be group data and no names will be attached to the final report.

The only risks anticipated are minor discomforts typically experienced by anyone when they are being asked to fill out questionnaires (e.g., boredom, mild stress owing to classroom environment). Survey sessions will be held on a group basis, with as many as 20-80 students at a time. Researchers and instructors will be in attendance during the entire session. One major benefit from your participation is that the information gained from this study will allow us to develop programs that may help nursing students be successful.

You may refuse to participate or quit at any time during the study. Should you choose not to participate, you may do so without any negative effect on you or your grade in any class. If you have any questions or concerns about this project, you may contact the Project Coordinator

By choosing yes below indicates that I have read and/or have had explained to me the purpose and requirements for the study and I agree to participate.

YES ☐

This survey requires the Student Information Form. Please DO NOT CONTINUE this survey until you have the form in your possession. This form should have been given to you by your instructor.

1. Last Name:
2. First Name:
3. Age:
4. Please choose the program you are enrolled in:
5. Please choose your program type?
6. Reading Comprehension Score:
7. Math Composite Score:
8. Composite Score:
9. Have you repeated a Nurse Entrance Test (TEAS 4/5, HESI, NET)?
10. Gender:
11. Marital Status:
12. Ethnic Origin:
13. Race:
14. Were you born in a country other than the United States?
15. If you answered "YES" to question 14, what country were you born in?
16. Are you the first person in your immediate family to attend college?
17. In a typical week how many hours will you work? (please respond to the nearest hour)
18. What is your commute time from home to school one way (to the nearest minute)

In what country were you born?

How long have you been in the United States?

19. During a typical fall or spring semester, how many semester credit hours do you expect to take while in the nursing program?

20. What year did you take your first college course?

21. Is English your first language?

22. If you answered No to Question 21, what is your first language?

23. Did you repeat A&P I?

24. If you answered YES to Question 23, how many times did you repeat A&P I?
(include W's)

25. Did you repeat A&P II?

26. If you answered YES to Question 25, how many times did you repeat A&P II?(include W's)

27. Highest grade earned in A&P I?

28. Highest grade earned in A&P II?

29. Did you take any developmental courses for TASP/THEA requirements?

30. If you answered YES to question 29, please choose which subjects.

31. Where did you take the majority of your science prerequisite courses?

32. Number of dependent children living with you:

33. If you have children, are your childcare arrangements:

34. Will you apply for financial aid while in nursing school?

35. If you answered yes to question number 34, what will be the expected duration of the financial aid:

36. When I experienced difficulty in prior prerequisite classes, I sought help from:
(Please check all that apply)

If your answer is no one, please skip this question and move to next survey.

Academic Instructor Peers Career Counseling Tutors in Subject Area

Other Institutional Resource

Nursing Student Survey 2

Please read the following questions and select one answer which best reflects your beliefs and/or experiences.

☐ Strongly Agree ☐ Moderately Agree ☐ Neutral ☐ Moderately Disagree

☐ Strongly Agree

1. My high school science classes prepared me for college science courses.
2. My high school math classes prepared me for college math.
3. My high school classes in general prepared me for college courses.
4. I manage my time to complete tasks.
5. I stress about school and my grades more than my classmates.
6. I have friends and/or classmates to study with for tests.
7. It is helpful to study in groups rather than alone.
8. I am good at preparing for and taking tests.
9. I was able to keep up with and understand my reading assignments for class.

10. I have a good memory.
11. I feel I can handle the academic work in nursing school.
12. I feel I will graduate from nursing school.
13. My friends support and encourage my choice of nursing as a career.
14. My family supports and encourages my choice of nursing as a career.
15. I anticipate studying more for nursing classes than I did in prerequisite classes.
16. I know when I am having trouble understanding a topic or subject.
17. I know when to ask for academic help from my instructors.
18. When I experienced difficult assignments in prior courses, I sought help from instructors.

Student Perception Appraisal-1

Choose only one answer.

Going to school is one part of your life. Certain factors may restrict or support YOUR successful goal achievement.

Evaluate each item in terms of how it may affect YOUR ability to remain in nursing courses this semester. Instrument developed by: Marianne R. Jeffreys in her text "Nursing Student Retention Understanding the Process and Making a Difference".

☐ Does Not Apply ☐ Severely Restricts ☐ Moderately Restricts ☐ Does Not Restrict or Support ☐ Moderately Supports ☐ Greatly Supports

1. Personal Study Skills:
2. Faculty advisement and helpfulness:
3. Transportation arrangements:
4. Financial Status:
5. Class schedule:
6. Family financial support for school:
7. Hours of employment:
8. Personal study hours:
9. College library service:
10. Family emotional support:
11. Family crisis:
12. Employment Responsibilities:
13. Prenursing enrichment program service:
14. College tutoring services:
15. College counseling service:
16. Family responsibilities:
17. Financial aid and/or scholarship:
18. Academic performance:
19. Encouragement by friends outside of school:
20. Encouragement by friends within classes:
21. Computer laboratory service:
22. Child care arrangements:

Self-Efficacy Scale

This questionnaire is a series of statements about your personal attitudes and traits. Each statement represents a commonly held belief. There are no right and wrong answers.

Please indicate your own personal feelings about each statement below by choosing one answer that best describes your attitude or feeling. Please be truthful and describe yourself as you really are, not as what you would like to be. Instrument developed by Mark Sherer, James E. Maddux, Blaise Mercadante, Steven PrenticeDunn, Beth Jacobs and Ronald W. Rogers.

☐ Strongly Agree ☐ Moderately Agree ☐ Neutral ☐ Moderately Disagree

☐ Strongly Agree

1. I like to grow houseplants.
2. When I make plans, I am certain I can make them work.
3. One of my problems is that I cannot get down to work when I should.
4. If I can't do a job the first time, I keep trying until I can.
5. Heredity plays the major role in determining one's personality.
6. It is difficult for me to make new friends.
7. When I set important goals for myself, I rarely achieve them.
8. I give up on things before completing them.
9. I like to cook.
10. If I see someone I would like to meet, I go to that person instead of waiting for him or her to come to me.
11. I avoid facing difficulties.

12. If something looks too complicated, I will not even bother to try it.
13. There is some good in everybody.
14. If I meet someone interesting who is very hard to make friends with, I'll soon stop trying to make friends with that person.
15. When I have something unpleasant to do, I stick with it until I finish it.
16. When I decide to do something, I go right to work on it.
17. I like science.
18. When trying to learn something new, I soon give up if I am not initially successful.
19. When I'm trying to become friends with someone who seems uninterested at first, I don't give up very easily.
20. When unexpected problems occur, I don't handle them well.
21. If I were an artist, I would like to draw children.
22. I avoid trying to learn new things when they look too difficult for me.
23. Failure just makes me try harder.
24. I do not handle myself well in social gatherings.
25. I very much like to ride horses.
26. I feel insecure about my ability to do things.
27. I am a self-reliant person.
28. I have acquired my friends through my personal abilities at making friends
29. I give up easily.
30. I do not seem capable of dealing with most problems that come up in my life.

APPENDIX C

INSTITUTIONAL REVIEW BOARD APPROVAL FOR SATIN RESEARCH PROJECT FROM INITIAL INSTITUTION

TO: Glenda Walker
Nursing Box 6156
Nacogdoches, TX
75962

RE: A Research Model for Identifying and Intervening with At Risk Nursing Students.

Case#AY2008-1002

TYPE OF RESEARCH: Grant supported Faculty Research

FROM: Michael E. Walker, Chair, IRB-H

DATE: 1/19/2011

I would like thank you for submitting the update on your project entitled "*A Research Model for Identifying and Intervening with At Risk Nursing Students-Nursing Innovation.*" to the IRB for review. The changes have been reviewed and the project has continued approval, with the revisions submitted, based on the following review criteria:

CFR §46.101 (b)(1) Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

Your project has approval through 1/27/2012, should you need additional time to complete the study you will need to apply for an extension prior to that date. The IRB should be notified of any planned changes in the procedures during the approval period, as additional review will be required by the IRB, prior to implementing any changes, except when changes are necessary to eliminate immediate hazards to the research participants. The researcher is also responsible for promptly notifying the IRB of any unanticipated or adverse events involving risk or harm to participants or others as a result of the research.

All future correspondence regarding this project should include the case number AY2008-1002.

APPENDIX D

INSTITUTIONAL REVIEW BOARD APPROVAL FROM THE UNIVERSITY OF TEXAS AT ARLINGTON



Office of Research Administration
Regulatory Services
817-272-3723
regulatoryservices@uta.edu
<http://www.uta.edu/research/administration>

**Institutional Review Board
Notification of Exemption**

March 28, 2013
Wendy Donnell
Dr. Barbara Raudonis
Nursing
Box 19407

Protocol Number: 2013-0435

Protocol Title: *A correlational study of a reading comprehension program and attrition rates of ESL nursing students in Texas.*

Type of Review: Exemption Determination

The UT Arlington Institutional Review Board (IRB) Chair, or designee, has reviewed the above referenced study and found that it qualified for exemption under the federal guidelines for the protection of human subjects as referenced at Title 45 Part 46.101(b)(4):

- Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

You are therefore authorized to conduct your research as of March 28, 2013

Pursuant to Title 45 CFR 46.103(b)(4)(iii), investigators are required to, "promptly report to the IRB any proposed changes in the research activity, and to ensure that such changes in approved research, during the period for which IRB approval has already been given, are **not initiated without prior IRB review and approval** except when necessary to eliminate apparent immediate hazards to the subject." Please be advised that as the principal investigator, you are required to report local adverse (unanticipated) events to the Office of Research Administration; Regulatory Services within 24 hours of the occurrence or upon acknowledgement of the occurrence.

All investigators and key personnel identified in the protocol must have documented Human Subject Protection (HSP) Training on file with this office. Completion certificates are valid for 2 years from completion date.

The UT Arlington Office of Research Administration; Regulatory Services appreciates your continuing commitment to the protection of human subjects in research. Should you have questions, or need to report completion of study procedures, please contact Robin Dickey at 817-272-9329 or robind@uta.edu. You may also contact Regulatory Services at 817-272-3723 or regulatoryservices@uta.edu.

REFERENCES

- Abele, C., Penprase, B., & Ternes, R. (2011). A closer look at academic probation and attrition: What courses are predictive of nursing student success? *Nurse Education Today*. Online Publication. doi: 10.1016/j.nedt.2011.11.017
- Aiken, L. H. (2007). U.S. nurse labor market dynamics are key to global nurse sufficiency. *Health Services Research*, 42, 1299-1320. doi: 10.1111/j.1475-6773.2007.00714.x
- Amaro, D. J., Abriam-Yago, K., & Yoder, M. (2006). Perceived barriers for ethnically diverse students in nursing programs. *Journal of Nursing Education*, 45, 247-254. Retrieved from <http://www.healio.com/journals/jne>
- Bosher, S., & Bowles, M. (2008). The effects of linguistic modification on ESL students' comprehension of nursing course test items. *Nursing Education Perspectives*, 29, 165-172. Retrieved from <http://www.nln.org/nlnjournal/>
- Brown, J. F. (2008). Developing an English as a second language program for foreign-born nursing students at an historically black university in the United States. *Journal of Transcultural Nursing*, 19, 184-191. doi: 10.1177/1043659607312973

- Buerhaus, P. I., Staiger, D. O., & Auerbach, D. I. (2009). *The future of the nursing workforce in the United States: Data, trends, and implications*. Sudbury: Jones and Bartlett.
- Bureau of Labor Statistics, U.S. Department of Labor. (2012). *Occupational outlook handbook* (2012-13 Ed.). Retrieved from <http://www.bls.gov/ooh/healthcare/registered-nurses.htm>
- Chapman, A. (2012). *A comprehensive prediction model of attrition for Texas nursing students utilizing optimum misclassification rates* (Master's Thesis). Available from ProQuest Dissertations and Theses database. (UMI No. 1521445)
- Choi, L. S. (2005). Literature review: Issues surrounding education of English as a second language (ESL) nursing students. *Journal of Transcultural Nursing*, 16, 263-268. doi: 10.1177/1043659605274966
- Cunningham, H., Stacciarini, J.- M. R., & Towle, S. (2004). Strategies to promote success on the NCLEX-RN for students with English as a second language. *Nurse Educator*, 29, 15-19. Retrieved from <http://journals.lww.com/nurseeducatoronline/pages/default.aspx>
- Donnelly, T. T., McKiel, E., & Hwang, J. J. (2009). Challenges and motivators influencing the academic performance of English as an additional language (EAL) nursing students: The perspectives of the students. *Canadian Journal of Nursing Research*, 41, 130-150. Retrieved from <http://cjnr.mcgill.ca/>

- Doolan, D. M., & Froelicher, E. S. (2009). Using an existing data set to answer new research questions: A methodological review. *Research and Theory for Nursing Practice: An International Journal*, 23, 203-215. doi: 10.1891/1541-6577.23.3.203
- Faul, R., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G* power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41, 1149-1160. Retrieved from <http://www.springer.com/psychology/cognitive+psychology/journal/13428>
- Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). Los Angeles: Sage.
- Fowler, J., & Norrie, P. (2009). Development of an attrition risk prediction tool. *British Journal of Nursing*, 18, 1194-1200. Retrieved from <http://www.britishjournalofnursing.com/>
- Gilchrist, K. L., & Rector, C. (2007). Can you keep them? Strategies to attract and retain nursing students from diverse populations: Best practices in nursing education. *Journal of Transcultural Nursing*, 18, 277-285. doi: 10.1177/1043659607301305
- Green, A., Wieck, K. L., Willmann, J., Fowler, C., Douglas, W., & Jordan, C. (2004). Addressing the Texas nursing shortage: A legislative approach to bolstering the nursing education pipeline. *Policy, Politics, & Nursing Practice*, 5, 41-48. doi: 10.1177/1527154403260139

- Guhde, J. A. (2003). English as a second language (ESL) nursing students: Strategies for building verbal and written language skills. *Journal of Cultural Diversity*, 10, 113-117. Retrieved from <http://tuckerpublish.com/jcd.htm>
- Higgins, B. (2005). Strategies for lowering attrition rates and raising NCLEX-RN pass rates. *Journal of Nursing Education*, 44, 541-547. Retrieved from <http://www.healio.com/journals/jne>
- Howell, D. (2007). The treatment of missing data. In W. Outhwaite & S. P. Turner (Eds.), *The SAGE handbook for social science methodology* (pp. 208-224). London: SAGE.
- Jalili-Grenier, F., & Chase, M. M. (1997). Retention of nursing students with English as a second language. *Journal of Advanced Nursing*, 25, 199-203. Retrieved from [http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1365-2648](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1365-2648)
- Jeffreys, M. R. (2007). Tracking students through program entry, progression, graduation, and licensure: Assessing undergraduate nursing student retention and success. *Nurse Education Today*, 27, 406-419. doi: 10.1016/j.nedt.2006.07.003
- Jeffreys, M. R. (2012). *Nursing student retention: Understanding the process and making a difference*. New York: Springer.

- Junious, D. L., Malecha, A., Tart, K., & Young, A. (2010). Stress and perceived faculty support among foreign-born baccalaureate nursing students. *Journal of Nursing Education*, 49, 261-270. Retrieved from <http://www.healio.com/journals/jne>
- Loftin, C., Newman, S. D., Bond, M. L., Dumas, B. P., & Gilden, G. (2012). Diversity in Texas nursing programs: A study of the relationship between supportive characteristics and graduation of Hispanic and other underrepresented minority nursing students. *Hispanic Health Care International*, 10, 159-167. doi: <http://dx.doi.org/10.1891/1540-4153.10.4.159>
- Memmer, M. K., & Worth, C. C. (1991). Retention of English as a second language (ESL) students: Approaches used by California's 21 generic baccalaureate nursing programs. *Journal of Nursing Education*, 30, 389-396. Retrieved from <http://www.healio.com/journals/jne>
- National League for Nursing. (2010). *Nurse educator shortage fact sheet*. Retrieved from <http://www.nln.org>
- Newton, S. E., & Moore, G. (2009). Use of aptitude to understand bachelor of science in nursing student attrition and readiness for the National Council Licensure Examination-Registered Nurse. *Journal of Professional Nursing*, 25, 273-278. doi: 10.1016/j.profnurs.2009.01.016

- Newton, S. E., Smith, L. H., Moore, G., & Magnan, M. (2007). Predicting early academic achievement in a baccalaureate nursing program. *Journal of Professional Nursing*, 23, 144-149. doi: 10.1016/j.profnurs.2006.07.001
- Olson, M. A. (2012). English as a second language (ESL) nursing student success: A critical review of the literature. *Journal of Cultural Diversity*, 19, 26-32.
Retrieved from <http://tuckerpub.com/jcd.htm>
- Osborne, J. W. (2012). Logits and tigers and bears, oh my! A brief look at the simple math of logistic regression and how it can improve dissemination of results. *Practical Assessment, Research & Evaluation*, 17, 1-10. Online Publication.
Retrieved from <http://pareonline.net/getvn.asp?v=17&n=11>
- Prymachuk, S., Easton, K., & Littlewood, A. (2008). Nurse education: Factors associated with attrition. *Journal of Advanced Nursing*, 65, 149-160. doi: 10.1111/j.1365-648.2008.04852.x
- Rogan, F., San Miguel, C., Brown, D., & Kilstoff, K., (2006). 'You find yourself.' Perceptions of nursing students from non-English speaking backgrounds of the effect of an intensive language support program on their oral clinical communication skills. *Contemporary Nurse*, 23, 72-88. Retrieved from <http://www.contemporarynurse.com/>
- Rosseter, R. (2012). *Nursing shortage fact sheet*. Retrieved from <http://www.aacn.nche.edu>

- Salamonson, Y., Andrew, S., Clauson, J., Cleary, M., Jackson, D., & Jacobs, S. (2011). Linguistic diversity as sociodemographic predictor of nursing program progression and completion. *Contemporary Nurse*, 38, 84-93. Retrieved from <http://www.contemporarynurse.com/>
- Salamonson, Y., Everett, B., Koch, J., Andrew, S., & Davidson, P. M. (2008). English-language acculturation predicts academic performance in nursing students who speak English as a second language. *Research in Nursing and Health*, 31, 86-94. doi: 10.1002/nur.20224
- Sanner, S., & Wilson, A. (2008). The experiences of students with English as a second language in a baccalaureate nursing program. *Nurse Education Today*, 28, 807-813. doi: 10.1016/j.nedt.2008.03.004
- Scheele, T. H., Pruitt, R., Johnson, A., & Xu, Y. (2011). What do we know about educating Asian ESL nursing students? A literature review. *Nursing Education Perspectives*, 32, 244-249. Retrieved from <http://www.nln.org/nlnjournal/>
- Schneider, M. (2010). *Finishing the first lap: The cost of first-year student attrition in America's four-year colleges and universities*. Washington, DC: American Institutes for Research.
- Starr, K. (2007). Nursing education challenges: Students with English as an additional language. *Journal of Nursing Education*, 48, 478-487. doi: 10.3928/01484834-20090610-01

- Sullivan, L. (2004). *Missing persons: Minorities in the health professions, A report of the Sullivan Commission on Diversity in the Healthcare Workforce*. Retrieved from <http://health-equity.pitt.edu/40/>
- Texas Board of Nursing. (2013). *RN's by race/ethnic group, age, and sex*. Retrieved from <http://www.bon.texas.gov/about/statistical.html>
- Texas Center for Nursing Workforce Studies, Texas Board of Nursing. (2012). *Nursing education program information survey: Student admission, enrollment, graduation* (EPublication No. E25-13936). Retrieved from <http://www.dshs.state.tx.us/chs/cnws>
- Texas Center for Nursing Workforce Studies, Texas Department of State Health Services Center for Health Statistics, Statewide Health Coordinating Council, Texas Center for Nursing Workforce Studies Advisory Committee. (2006). *The supply of and demand for Registered Nurses and nurse graduates in Texas* (Report No. 25-12514). Retrieved from <http://www.dshs.state.tx.us/chs/cnws/default.shtm>
- Texas Higher Education Coordinating Board. (2009). *Strategies to increase the number of initial licensure Registered Nurses and nursing faculty*. Austin: Texas Higher Education Coordinating Board.
- U.S. Census Bureau. (2013). *State and County QuickFacts*. Retrieved from <http://quickfacts.census.gov/qfd/states/48000.html>

Uyehara, J., Magnussen, L., Itano, J., & Zhang, S. (2007). Facilitating program and NCLEX-RN success in a generic BSN program. *Nursing Forum*, 42, 31-38.

Retrieved from [http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1744-6198](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1744-6198)

Walker, G. C., Klotz, L., Martin, P., Miller, G. K., Missildine, K., Bishop, S.,...Glymph, D. (2011). A regional academic partnership for the early identification and retention of at-risk nursing students. *Journal of Professional Nursing*, 27, e8-e13. doi: 10.1016/j.profnurs.2011.09.002

Weaver Instructional Systems. (2013). *Reading intervention*. Retrieved from <http://www.wisesoft.com>

Weaver, R., & Jackson, D. (2011). Evaluating an academic writing program for nursing students *who have English as a second language*. *Contemporary Nurse*, 38, 130-138. Retrieved from <http://www.contemporarynurse.com/>

Werner, C. (2011). *The older population: 2010 census briefs*. Retrieved from www.census.gov/prod/cen2010/briefs/c2010br-09.pdf

BIOGRAPHICAL INFORMATION

Wendy Donnell received her BSN from Stephen F. Austin State University in 1992. She received her MSN with an education focus from the University of Texas at Tyler in 2005. Mrs. Donnell has taught for the last 10 years in the DeWitt School of Nursing at Stephen F. Austin State University. She has taught basic, medical/surgical, and community nursing. Currently, she is the simulation coordinator and teaches online pathophysiology and pharmacology.

Mrs. Donnell's research interests include autism, simulation in nursing education, and nursing student retention. She is currently the intervention specialist for a statewide research study involving the retention of nursing students. She plans to continue this work in the near future. Mrs. Donnell has been a speaker at several national conferences on the use of simulation in nursing education. She is beginning a research study which will focus on competent cultural care for patients who do not speak English. Mrs. Donnell plans to begin her autism research career in the near future by studying the effects of chronic stress and resulting disease in parents of children with an autism spectrum disorder.