ACADEMIC FACTORS THAT CONTRIBUTE TO PRE-LICENSURE NURSING STUDENT PERSISTENCE

by

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Abstract

ACADEMIC FACTORS THAT CONTRIBUTE TO PRE-LICENSURE NURSING STUDENT PERSISTENCE

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The need for registered nurses is expected to grow exponentially in the next decade. As nurses retire and more Americans access the healthcare system, more than 400,000 nurses will be needed nationally (Auerbach, Buerhaus, &Staiger, 2011). Based on projections, by 2020, approximately 25,000 nursing students will need to graduate to the meet the state's need for nurses; in 2013, slightly more than 11, 000 candidates took NCLEX after successfully completing their nursing program (Texas Board of Nursing, 2014). Currently 70% of students admitted to a nursing program in Texas do not persist and graduate (Texas Higher Education Coordinating Board [THECB], 2006). To meet the increasing demand for nurses, identifying the essential academic supports that nursing students need to persist and graduate may increase the number of practicing nurses. A 14-item academic support tool was created to examine the association of academic support and pre-licensure nursing student persistence. Texas program deans and directors self-reported the academic support available to nursing students and their persistence rate in this descriptive correlational study. A persistence benchmark of 85% was set by the THECB (2006). Three types of support were evaluated: institutional support, pre-program support, and program support. Introductory courses that taught

study skills and critical thinking skills, specialized lab that assisted with math skills, and the use of academic advisors prior to nursing school admission, as well as nursing faculty whose workload was student persistence in nursing school were associated with persistence. Conversely, when programs offered courses that taught test taking skills prior to nursing school and provided test prep sessions during nursing school, students were less likely to persist and graduate. Academic support contributed to nursing student persistence; interpretation of findings; implications for nursing education; and recommendations for future studies were reported.

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Chapter 1

Introduction

For more than 10 years, nurse scientists have voiced concern over the increasing need for registered nurses (RNs). Buerhaus, Staiger, & Auerbach (2000) predicted a 20% shortage of RNs by 2020. However, with the recent recession, many RNs delayed retirement, changed their work status from part time to full time, and returned to the bedside, reducing the number of RNs needed for the immediate future. With the passage of the Affordable Health Care Act, an additional 32 million Americans are expected to access the healthcare system, increasing the need for nurses and other healthcare providers (Institute of Medicine[IOM], 2011). By 2015, it is predicted that an additional 227,000 RNs will be needed to replace the retiring experienced RNs (Staiger, Auerbach, & Buerhaus, 2012). This projected shortage could jeopardize health outcomes and impede the ability of nurses to provide safe competent care.

Nursing schools across the nation have seen an increase in enrollment (American Association for Colleges of Nursing [AACN], 2012), which can potentially reduce the shortage; in fact, the number of students who apply to nursing programs far exceeds the capacity of the programs. Insufficient number of nursing faculty to educate these students, as well as a lack of clinical sites and classroom space, contribute to turning away thousands of qualified applicants (AACN). The lack of qualified faculty was cited among the top two reasons for not increasing enrollment (Texas Center for Nursing Workforce Studies [TCNWS), 2013a). Of further concern, many nurse educators may retire in the near future. In Texas, more than 22% of the nurse educators are expected to retire within the next five to 15 years (THECB, 2009). Additionally, persistence rates

have been reported among associate degree in nursing (ADN) programs at 58% (Fraher, Belsky, Carpenter, & Gaul., 2008) and bachelor of science in nursing (BSN) programs at 50% (Newton & Moore, 2009); therefore, it is crucial to focus on the successful completion of students who are admitted to nursing school.

Admission to nursing school is based on a selection process (van Rooyen, Dixon, Dixon, & Wells, 2006). Candidates must meet specific criteria to be considered for admission. Interestingly, standardized admission criteria for nursing programs have not been established. Objective data, most often,

grade point average (GPA) and the results of standardized tests scores, are often used as criteria for nursing student selection, but neither the ideal GPA, the ideal standardized test, nor the ideal test scores have been established for nursing school admission (Newton & Moore, 2010). A higher GPA requirement does not guarantee success. For example, Texas Woman's University [TWU] (2012) has a cumulative GPA requirement of 3.0 and a 64% minimum score on the Test of Essential Academic Skills (TEAS) test. The University of Texas at Arlington [UTA] (2012) admission criteria requires a minimum cumulative GPA of 2.5 and a minimum Health Education System Inc (HESI) score of 300. In 2009, TWU had a persistence rate of 78.8%, while UTA's persistence rate was 89.1% (Texas Board of Nursing, 2010).

Researchers have found that science grades, particularly biology, anatomy, and physiology, are predictive of student persistence (van Rooyen et al., 2006; Wong & Wong, 1999). Potolsky, Cohen, and Saylor (2003) reported prerequisite science grades were indicative of students' ability to succeed in pathophysiology and pharmacology courses, which were taken during the first semester of nursing school. Students with

high science and pre-nursing (cumulative) GPAs were more likely to successfully complete nursing school (Seago, Keane, Chen, Spetz, & Grumbach, 2012). Early identification of students, who may struggle in nursing school, allows for early intervention. Moreover, Walker et al. (2011) flagged students "at risk" when they had anatomy and physiology course grades of 2.5 or lower.

While GPA appears to be predictive of student success, meaning persistence to graduation, GPA alone does not guarantee success. Tinto (2012) has identified multiple factors that impact college completion, and has suggested multiple mechanisms of support, which include academic support, social support, and financial support. Few researchers have studied academic support at the nursing program level. The type of support and necessary resources required for student success is not known. Although it is important to admit the best candidates to nursing school, once admitted, nursing programs must provide the resources and support so students can persist to graduation. This research study will focus on the impact of academic support, provided by the institution and nursing programs in Texas, on student persistence to graduation.

Background and Significance

With more than three million RNs licensed to work in the United States (US), nurses represent the largest providers of patient care (IOM, 2011). According to the ~~US~~ Department of Health and Human Services (2008), more than 44% of RNs who practice in the US are over the age of 50. In Texas, more than 53% of the currently licensed nurses are 45 years of age or older (Texas Board of Nursing, 2013a). The need for registered nurses is projected to grow in the US by 26% from 2010-2020, as preventative care becomes the focus of healthcare and as an increasing number of older Americans

access the healthcare system (US Department of Labor Bureau of Labor Statistics, 2012). Additional nurses are needed as populations shift and expand.

The state of Texas has experienced a 20.6% population growth from 2000-2010 (Texas State Data Center, 2012). If the projections for 2020 are correct, another three to eight million people will reside in Texas, straining the infrastructure of the state and having an impact on the need for nurses and healthcare providers. The Texas Center for Nursing Workforce Studies [TCNWS) 2012) has forecast the need for 17,777 nursing graduates in 2015, which is an increase of more than 7,500 students per year from 2011. While the need to educate RNs is apparent, the persistence rates for nursing students, enrolled pre-licensure RNs programs, have remained relatively constant at 69% from 2007 to 2011 (TCNWS, 2012). Almost one third of students admitted to a nursing program in Texas did not persist in the nursing program. In 2007 alone, the THECB (2009) reported more than 2400 students admitted to nursing programs did not graduate; this considerable loss of potential registered nurses puts additional burdens on working nurses and contributes to the nursing shortage in Texas.

The need to educate more nurses is apparent; admitting students who can persist to graduation is vital to meet the need for RNs. With three out of ten students unable to complete nursing school, examining the barriers and contributors to persistence is needed. In chapter one, the following will be discussed: Brief demographic data on newly admitted nursing students, followed by a discussion of the admission criteria used to admit students into nursing programs, and then academic support addressing contributors and barriers to persistence of nursing students. The model for student

persistence, problem statement, research questions, and assumptions will also be discussed.

Demographics of Texas Nursing Students

In 2012, the TCNWS reported on the 105 pre-licensure RN programs in Texas, which consisted of one diploma program, one Master of Science in Nursing (MSN) Alternate Entry Program, 66 associate degree in nursing (ADN) programs, including eight licensed vocational nurse (LVN) to ADN programs, 37 Bachelor of Science in Nursing (BSN) programs (TCNWS, 2013b). Demographic data from the traditional or generic ADN and BSN programs are reported; LVN to ADN, MSN program, and diploma school are combined in "all programs". See Table 1. The table shows the characteristics of students enrolled in nursing programs in 2010-2011. More than 80% of the nursing students are women and more than 50% are White. While gender is often included in the demographic data collected for research studies, low sample sizes of males limit significant results. Goff (2011)found age was a predictor of academic performance, although neither age nor ethnicity was found to predictive of persistence among BSN students (Alden, 2008). Of important note, Texas nursing schools are admitting more minority students, reflecting the Texas population.

In 2011, 10,228 students graduated from pre-licensure programs in Texas which was approximately 52% of 19, 721students who were originally admitted to a program in 2009 (TCNWS, 2012). To meet the demand for Texas nurses in 2020, more than 24, 870 individuals will need to complete nursing school that year. Admitting an adequate number of nursing students into nursing programs and ensuring that these students persist and graduate are essential to meet these projected targets.

Table 1-1 Comparison, by percentage, of Demographic Data in Texas, Academic Year 2010-2011: Newly admitted students in ADN, BSN, and all programs

		Generic ADN programs	BSN programs	All programs
Age	25 or less	33.2%	64.6%	43.6%
	26-30	23.6%	16.5%	20.6%
	31-40	28.2%	13.0%	23.1%
	41-50	11.6%	4.5%	9.8%
	Over 51	3.2%	1.2%	2.8%
Gender	Female	Not reported	Not reported	81.7%
	Male			18.3%
Ethnicity	White	53.7%	49.7%	50.9%
	African American	11.5%	13.0%	13.8%
	Hispanic	25.8%	20.0%	23.1%
	Other	8.2%	14.4%	10.3%
	Missing	0.8%	3.0%	1.9%

TCNWS (2012b)

Predictive Ability of Admission Criteria

Each nursing school sets its own minimum admission requirement. In the local Dallas Fort Worth area, most nursing schools have a minimum GPA requirement and mandate a standardized admission test to be taken prior to being admitted to nursing school. Admission requirements are presented in Table 2 as well as the graduate rates from the nursing program (Texas Board of Nursing, 2010). As seen in Table 1-2, the minimum GPA, either science or cumulative, ranged from 2.0-3.0; all of the schools required an entrance exam; and the graduation or persistence rate was between 50.6% and 89.1%.

Table 1-2 Admission Criteria and Graduate Rates for local Dallas Fort Worth area nursing schools

Name of School	Type of program	Science GPA	Cumulative GPA	Entrance exam and score	Persistence rate in 2009
Baylor (n.d.)	BSN	Not cited	3.0 or higher	HESI A2	88.5%
El Centro (2012)	ADN	Not cited	2.5 or higher	HESI A2: 70% on each section	68.8%
TCC (2012)	ADN	Minimum 2.0; most applicants have 3.4	C or higher on all courses	HESI A2	75.7%
TCU (2010	BSN	Not cited	Minimum 2.5	HESI A2	82.4%
TWU (2012)	BSN	Minimum grade of C in science courses	Minimum 3.0 non-nursing courses	TEAS: 64% minimum score	78.8%
UTA (2012)	BSN	Minimum 2.5	Minimum 2.5	HESI A2: minimum score 300	89.1%
Weatherford College (2010)	ADN	Minimum 2.5	All pre-requisite courses: GPA Minimum 2.5	TEAS: 70% minimum score	50.6%

Nursing schools use the GPA as an indicator to predict the students' ability to succeed in their programs (Jeffreys, 2007b; Newton, 2008; Sayles, Shelton, & Powell, 2003; Wolkowitz & Kelley, 2010); however, a universal GPA has not been established for admission, as seen in table 2. Prerequisite science courses appear to be good indicators of success (Potolsky et al., 2003), but cumulative GPAs may also be used (Jeffreys, 2007b).

Standardized entrance exams help nursing school faculty identify at-risk or underprepared students (Sayles et al., 2003) so remedial assistance can be provided (Murray, Merriman, & Adamson, 2008). Low math and reading scores on the Nursing Entrance Test (NET) as well as low GPAs were suggestive of possible academic struggle

and potential failure (Hopkins, 2008). Entrance exams were found to be predictive of early academic success in sophomore nursing students (Newton, Smith, Moore, & Magnan, 2007) and correlations were found between scores on the HESI (Health Education System Inc.) admission exam and nursing course grades (Murray et al., 2008). Although consistent admission criteria do not exist, once students are admitted to a nursing program, academic support and assistance may need to be given to students so they can persist to graduation.

Academic Support

Providing support and resources to students so they can succeed have been utilized for decades (Tinto, 2012). Academic support, a multifaceted construct, includes tangible resources such as libraries, computer lab, and simulation centers (Jeffreys, 2012) and well as non-tangible resources including faculty or supportive personnel, courses, and activities that promote learning or encourage students to actively engage in their learning. Many researchers have identified factors that contribute to student persistence and barriers that impede student progress in higher education. Financial support, from grants, scholarships or parental support contributes to persistence. Institutional support, feelings of belonging or connectedness, and the students' commitment to their educational goals have been found to increase persistence in all college students (Tinto, 2012). Extensive research has been conducted on first year college students, which has shown the positive impact of academic support on persistence (Pascarella, 1982; Tinto, Cullen, & Columbia University, New York, NY,Teachers College, 1973; Tinto,1975, 1987b, 2012); however, few researchers have

addressed the impact of academic support and persistence among pre-licensure nursing students.

The overall construct of support in higher education may include academic and non-academic factors. The focus of this study is limited to academic support. Academic support will be subdivided into three domains: institutional support, pre-program support, and program support. Institutional support is the infrastructure or framework that supports the academic efforts of all students enrolled in an institute of higher learning; pre-program support refers to tangible and non-tangible support offered to students prior to admission to a nursing program; and program support refers to the same tangible and non-tangible resources provided to students within a nursing program. Typically, more than one factor contributes to student success or student failure. Both contributors and barrier to nursing student persistence will be discussed.

Contributors to nursing student persistence. Early intervention with freshmen nursing students including positive self-talk and establishing connections or social support of family, friends, and classmates contributed to their persistence (Williams, 2010). Learning effective study skills and appropriate time management skills contributed to academic success and persistence (Igbo et al., 2011; Straker & Kelman, 2007) and faculty and peer mentoring have been shown to positively affect nursing student persistence (Baker & Griffin, 2010). Age and gender may also impact student success (van Rooyen et al., 2006). Remedial courses and programs designed to assist students have shown positive outcomes for some students (Harding, 2012; Igbo et al., 2011; McGann & Thompson, 2008). Adequate financial resources, a love for learning, and social support from family and friends, were found to contribute to nursing student

persistence (McGann & Thompson, 2008; Norman, Buerhaus, Donelan, McCloskey, & Dittus, 2005).

Threats to nursing school persistence. Students with GPAs less than 2.5 on a 0-4 grading scale (McGann & Thompson, 2008) and low standardized test scores put nursing students at risk for not completing their nursing programs. Poor academic preparation (Harding, 2012; Newton, 2008;. White, 2004) English as a second language (Carr & Dekemel-Ichikawa, 2012), unsupportive nursing faculty (Gardner, 2005); inadequate financial resources (Igbo et al., 2011), outside commitments, including family responsibilities and work obligations (Walker et al., 2011) contribute to student attrition or not completing a nursing program. A GPA of less than 2.5, lack of support, late recognition and delayed intervention contributed to the student attrition and possible failure.

Researchers have identified risk factors that impact persistence that include lack of financial support, lack of family and peer support, and lack of adequate academic skills (Jeffreys, 2007b; Newton, 2008; Peterson, 2009; Sayles, Shelton, & Powell, 2003; Wolkowitz & Kelley, 2010); while adequate peer, family, and financial support as well as academic ability and student support positively contributes to persistence (Jeffreys, 2012).

Summary

Nursing programs use GPA and a variety of standardized tests to identify the best candidates for admission. Although GPA has been identified as a strong predictor of persistence, a universal GPA has not been established. In Texas, once students are admitted into a nursing program, approximately 30% do not persist and graduate on time.

While many researchers have examined the correlation between admission criteria and student persistence, limited research has been conducted related specifically to academic support and persistence.

Framework

Model of Nursing Student Persistence

Academic Support: A Model of Nursing Student Persistence was developed from applicable constructs related to student persistence identified in Tinto's Institutional Action framework (2012) and Jeffreys's Model of Nursing Undergraduate Retention and Success (2012). Tinto's framework is a comprehensive model for all college students, with much of his focus on the first year experience. For more than forty years, he has studied factors that promote and impede college student success (Tinto et al., 1973; Tinto, 1987a; Tinto, 2012). He has determined that academic support, social support, and financial support contribute to student persistence. Jeffreys's comprehensive model incorporates many factors that impact undergraduate nursing student retention, including academic factors, environmental factors, outside surrounding factors, and student affective factors (Jeffreys, 2012). Tinto examined persistence from an institutional level and Jeffreys examined persistence or student success based on individual students. Neither Tinto nor Jeffreys have isolated academic support to determine its impact on student persistence from a program level.

Model creation. The multicolored Model of Nursing Student Persistence was created to show relationships of what is known and what is not known related to academic support. Traffic light colors of green, yellow and red show relationships within the model. Contributing factors are green, showing a positive relationship to completing

a nursing program; barriers to persistence impede or stop progression are colored red; and the impact of academic support, which is not known or may be cautionary contributors to persistence, are colored yellow. The study will focus on the association between academic support and nursing student persistence.

Model variables. Demographic data and admission criteria are fixed variables as nursing students enter nursing programs with these traits. Although admission criteria differ from program to program, all students have met the requirements of their program and are enrolled in nursing school. Having financial resources, family and social support (Tinto, 2012), academic ability (White, 2004), which is measured by GPA, and effective study skills and habits (Straker & Kelman, 2007), do contribute to students persisting or progressing through a nursing program and graduating on time. Students at risk for not progressing or completing school and graduating often lack financial resources, have outside commitments of family or work excessively, possess poor study habits (Walker et al., 2011) and/or are students whose first language is not English (Carr & Dekemel-Ichikawa, 2012)

Academic support includes support at the institutional, pre-nursing program, and nursing program level. Academic services, at the all levels, may include tutoring, faculty interactions, supplemental instruction, access to libraries, computers, educational resources, and student support activities and courses; all of these services and resources could contribute to nursing student persistence.

Need for survey tool. Each institution of higher learning may provide different academic services and resources to their students. Researchers have studied a variety of factors that contribute to student persistence, but have not focused exclusively on

academic support. A tool that measures essential components of academic support is not available; therefore, a tool will be developed and will be discussed in chapter three.

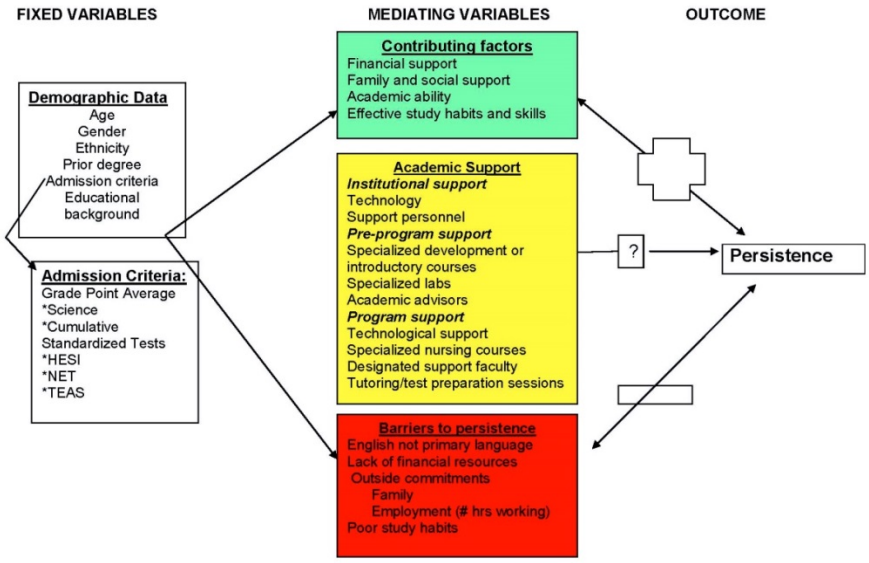

Figure 1: Academic Support: Model of Student Persistence

The conceptual definitions and operational definitions are provided in Table 3. The operational definitions correlate with the essential component identified by the five education experts queried through the Delphi Technique for the tool development. The survey tool is called Academic Factors Impacting Nursing Student persistence (AFINS).

Table 1-3 Conceptual and operational definitions

	Conceptual definition	Operational definition
Persistence	Ability of nursing students to complete required course work in a pre-determined time frame.	Completing LVN to associate degree nursing program within 18 months after admission to nursing school or completing a four semester programs within 36 months (Texas Board of Nursing, 2010). Four semester programs include ADN, BSN, and Diploma.
Academic Support	Assistance and resources provided to college students, which incorporate institutional support, pre-program support and program support.	All 14 items on the Academic Factor Impacting Nursing Student persistence (AFINS) survey:
Institutional Support	Institutional support was defined as the students' right to use physical or material resources, such as library resources and computer labs, and the support personnel who provide these services.	Three items (AFINS) survey: One item related to library resources; two items related to personnel support
Pre-program Support	Pre-program support was defined as assistance or enrichment provided to students from peers, faculty, including mentoring and tutoring, and courses designed to address academic or study deficiencies at the university level prior to admission into a nursing program or nursing school.	Five items on the AFINS survey: Four items related to specialized development or introductory courses and one item related to academic advisors.
Program Support	Program support was defined as assistance or enrichment provided to students from peers, faculty, including mentoring and tutoring, and courses designed to address academic or study deficiencies during a nursing program or when students are enrolled in nursing school.	Six items on the AFINS survey: One item related to technological support; three items are related to specialized nursing course; one item related to tutoring/test prep sessions; and one item related to designated faculty support

Statement of Purpose

The purpose of this descriptive exploratory study was to determine whether academic support contributes to nursing student persistence. Academic support includes

assistance to students at the institutional level, pre-program level, and program level. The association of academic support within each domain will be examined in relation to persistence of students in pre-licensure nursing programs.

Tinto's interactionalist theory (2004; Tinto & Pell Institute for the Study of Opportunity in,Higher Education, 2004; Tinto, 2012) has done extensive research on institutional support and has found a positive correlation between institutional support for first year students and their retention at community colleges and universities. Jeffreys (2007a, 2012) has identified personal, academic, environment, and psychosocial factors that impact nursing student retention. Researchers have not examined academic support at the institutional level, pre-program, and program level combined as contributors to nursing student success as measured by persistence to graduation; therefore, this study will examine the association between the three levels of academic support and nursing student persistence.

Research Questions

Three research questions will be answered during of this study. The first question examines the association between the institutional support and pre-licensure nursing student persistence. The second question explores the association between academic support provided to pre-program students and pre-licensure nursing student persistence, and the third question examines the association between program support and pre-licensure nursing student persistence.

1. What is the association between institutional support and pre-licensure nursing student persistence as self-reported by Texas nursing program deans and directors?

2. What is the association between pre-program support and pre-licensure nursing student persistence as self-reported by Texas nursing program deans and directors What is the associate between pre-nursing program support and pre-licensure nursing student persistence in Texas nursing programs?

3. What is the association between program support and pre-licensure nursing student persistence as self-reported by Texas nursing program deans and directors What is the association between nursing program support and pre-licensure nursing student persistence in Texas nursing programs?

Assumptions of the Model of Student Persistence

1. Nursing students who have a science or cumulative GPA of 3.0 or higher are more likely to persist in nursing school than student with a GPA less than 3.0.

2. Nursing students who possess good study habits and effective time management skills are more likely persist in nursing schools than study with poor study habits and ineffective time management skills.

3. Of the nursing students who apply for financial aid, the ones who receive it are more likely to persist.

4. Nursing students who have support at the institutional level are more likely to persist than students without institutional support.

5. Nursing students who have support at the pre-program level are more likely to persist than students without pre-program support.

6. Nursing students who have support at the program level are more likely to persist than students without program support.

Summary of Chapter

The need for RNs in Texas is expected to increase exponentially by 2020 with the projected population growth and a large number of experienced nurses expected to retire. For more than five years the persistence rate of Texas nursing students has remained between 69%-71%. The reason more than 30% of students who are admitted to nursing school but do not persist is not fully understood. All nursing schools have admission requirements designed to select individuals who can succeed. Researchers have found a lack of financial resources, poor study habits, and outside obligations contribute to students not completing a nursing program. A gap in the literature exists pertaining to academic support from an institution, pre-program, and program level as contributors to persistence. No substantive evidence exists to support that academic support contributes to pre-licensure nursing student persistence; therefore, the focus of this research study is to determine if academic support contributes to nursing student persistence.

Chapter 2

Introduction

The escalating need for RNs mandates increasing the number of candidates into nursing programs and then providing adequate support so they can persist and graduate on time. The Texas Higher Education Coordinating Board [THECB], 2009) reported that three out of ten students who begin nursing programs do not persist and graduate. High attrition rates are attributed to faculty shortage, lack of student support, and inadequate resources. Students' inability to complete college is not limited to nursing students.

Each year, thousands of individuals enter higher education with a goal of achieving a degree or certification. In the US, 58 % of first-time, full-time students who begin a four year college program graduate on time, and 30% of two year college students graduate on time (National Center of Education Statistics [NCES], 2012). On time graduation is defined as completing associate degree education in three years or baccalaureate education in six years (NCES, 2012). Strategies that promote student retention facilitate student persistence. Academic and social integration have been found to increase persistence rates. Students, who feel they are part of their college or university community, tend to complete their studies (Tinto, 2012). Students who participate in learning communities, interact with student mentors, and have access to support services often graduate from college (Braxton, McKinney, & Reynolds, 2006) Nurse researchers have attributed financial support, technical support, social and moral support as contributors to persistence in nursing school among Hispanic students (Bond et al., 2008; Cason et al., 2008).

Support is a multifaceted construct. Academic support is one component of support with three identified domains: institutional support, pre-program support, and program support. Researchers have not focused specifically on academic support and its role in student persistence. Therefore, this chapter will address the contribution of academic support to student persistence. The terms will be defined, followed by a discussion on how the components of academic support impact student persistence.

Review of Relevant Literature

Academic support was defined as assistance or enrichment provided to students from peers, faculty, including mentoring and tutoring, tangible and technological resources, and courses designed to address academic or study deficiencies. The goal of academic support was to increase the likelihood of persistence.

Institutional Support

Institutional support was defined as the students' right to use physical or material resources, such as library resources and computer labs, as well as nonmaterial support, personnel who provide services and support to students. Institutions have a unique responsibility to provide support to students (Tinto, 1993). The access and use of institutional resources have been cited as a contributor to persistence in higher education (Tinto, 2012).

Material resources. Integration within an institution took into account the facilities students were able to access such as the library, computer labs, and other technology. Heaney & Fisher (2011) found students who used institutional resource were more likely to return to school in their sophomore year than students who did not access resources. Providing college students with books and other library resources could increase

retention (Gaide, 2004; Hagel, Horn, Owen, & Currie, 2012; Painter, Bailey, Gilbert, & Prior, 2006). Electronic books and virtual resources were readily available to online and traditional students, allowing students easy access to necessary materials (Painter et al., 2006). Tutorials that provided instructions as well as collaboration between faculty and library staff increased the use of online resources to students. Librarians often worked directly with students, helping them to locate resources and providing services that contributed to their success (Hagel et al., 2012). Haddow & Joseph (2010) found that students who accessed library resources early in the semester were more inclined to stay in school. Not surprising, students aged 21 or older tended to use books, while students under 21 used more electronic resources. Students who did not access the library were more likely to withdraw from school than library users (Haddow & Joseph, 2010). The use of digital books and online resources did not increase academic performance or retention, despite participants' belief that this technology aided them in school (Hughey & Manco, 2012).

Nonmaterial resources. The approachability of faculty (Cason et al., 2008) positive faculty interactions (Hansen & Beaver, 2012), accessibility of support personnel (Stube et al., 2013) and an environment conducive to learning (Bowman & Dodge, 2011) were cited as contributors to student persistence. Lack of faculty support could be an institutional barrier to student persistence (Bond et al., 2008). The role of faculty as mentor, coach, and tutor will be discussed in detail within the pre-program and nursing program support sections.

Pre-program Support

Pre-program support was defined as assistance or enrichment provided to students from peers, faculty, including coaching, mentoring and tutoring, and courses designed to address academic or study deficiencies at the college or university level and not specific to the nursing program or nursing school. Students who used academic support programs in their first year of college were more likely to persist to the second year of college (Snyder et al., 2002). Campbell & Dickson (1996)recommended that academic support begin during pre-nursing courses as a strategy to increase retention and persistence.

Predictors of persistence prior to admission to a nursing program included high GPA, acceptable standardized test scores on the American College Test (ACT) or Scholastic Achievement Test (SAT), and being academically ready for college (Jeffreys, 2007b; McGann & Thompson, 2008; Tinto, 2012). Pre-requisite science and other courses are required for admission to nursing school. As a method to increase persistence, Potolsky, Cohen, & Saylor (2003) recommended a minimum science course grades of B and excluding applicants who repeat science courses due to a failure; these recommendations necessitated providing academic support prior to admission to nursing school.

Technology: Computer use and technological or digital devices are ubiquitous in the higher education environment (Fluck & Dowden, 2013) Technology use among digital natives, individuals who grew up using technology, correlated with their individual needs and their learning style and information style; these freshmen used technology, such as laptops and cell phones, to organize their schedules and course work (Mizrachi & Bates,

2013). Students, who participated in either a simulated lab or remote lab, felt more engaged in their learning and had better understanding of concepts when using videos versus photos to visualize physics concepts(Sauter, Uttal, Rapp, Downing, & Jona, 2013). Freshmen students reported educational technology enhanced their learning through the use of electronic keypads (Williams, Lewis, Boyle, Brown, & Holt, 2008). Studies specific to technology use contributing to academic support over several semesters were not found

Mentoring, coaching, and tutoring. Mentoring promotes personal and professional development of students through role modeling, teaching, helping, and encouraging individuals who are inexperienced and need the academic support mentors can provide (Dorsey & Baker, 2004). Hu & Ma (2010) studied the impact of mentoring on high achieving high school students who received college scholarships based on financial need and concluded mentoring positively impacted student persistence. When students were assigned to a mentor, utilized mentors for guidance and support, and valued the student-mentor relationship, they continued in higher education. Students who had post baccalaureate goals were more likely to use mentors than students without that aspiration (Hu & Ma). Interestingly, (Baker, 2013) found peer support was ineffective as increasing GPAs for minority students during their first two years of college; faculty support positively impacted these students

Coaches or academic retention counselors assisted first year students with time management skills and balancing work and school (Damast, 2012). Meeting frequently with the students helped students to stay focused on school, resulting in a 15% increase in retention from first year students to the second year college. Working with first year

college students, academic coaches assisted students as they transitioned into college life by examining the student's ability to succeed through self-assessment, reflection, and study planning. Ninety-two percent of the students who used these techniques and resources were academically successful (Robinson & Gahagan, 2010; Williams, 2010).

Program support of pre-nursing students appeared to positively impact persistence. Establishing relationships with peers and the positive impact of faculty availability inside and outside of the classroom were cited as factors to persistence among successful students enrolled in pre-nursing courses (Williams, 2010). The students identified time management, using resources, self-determination or can do attitude, and making connections with other students and faculty as instrumental to their success. First generation and minority students often encounter a difficult transition and challenges that impact their success.

Academic support was provided to minority students through a comprehensive program, which included tutoring, remedial assistance in science, reading, writing, and math courses, and preparatory assistance for standardized admission testing beginning in high school and providing ongoing support throughout nursing school (Gordon & Copes, 2010). The program was expanded to include mentoring or professional role modeling and exposure to cultural activities once admitted into nursing school. Students who participated in this program exceeded university persistence rates, graduated, passed NCLEX; many remained within their underserved community as RNs. Another program aimed at increasing minority nurses, specifically Alaskan Native nurses, was established in 1998. Pre-nursing students received program support that continued throughout nursing school (DeLapp, Hautman, & Anderson, 2008). Support activities

included peer mentoring, academic advising, and tutoring services. Data for one academic year showed 82% of 204 students who utilized tutoring services successfully passed their courses. As a result of this program, 70% of the admitted Alaskan Native students completed the nursing program and another 23% are still in nursing school.

Support courses. Many students enter higher education without the tools needed to be successful, particularly adequate study skills and good time management skills (Swart, Lombard, & de Jager, 2010). Colleges and universities have developed courses to address students' study deficiencies and to improve persistence rates. Designed to provide freshmen students with a structured class that taught basic academic and social skills, first year experience courses have been used in higher education for more than a decade. Early intervention appeared to promote persistence. Students who took a college success course in their first semester of college were more likely to persist to the second year than students who took the course after their first semester (Cho & Karp, 2013). Lee (2007) found analytical thinking exercises from case studies was an effective tool to develop critical thinking and to improve academic success among conditionally admitted undergraduate students.

A high attrition rate was the impetus for developing a freshmen success course for engineers, technology and computer science students that focused on problem solving, collaboration with other students, and improving computer skills as well as oral and written skills (Pomalaza-Raez & Groff, 2003). Students worked in teams to design, build, and program a mobile robot. Positive student feedback and persistence in the program were reported. A college retention course, College Survival Skills, was developed after determining that unsuccessful students did not possess basic math skills

(Allen & Lester, 2012). A Success Coach delivered the course content and taught organizational, time management and study skills. Following this implementation, retention rates improved (Allen & Lester).

Academic advising. Academic advising, "guidance for plan of study and specific courses" (Bond et al., 2008, pg.137), was cited as a contributing factor to student success (White & Schulenberg, 2012). Whether a faculty member or non-faculty member served solely in the advisor role, academic advisors assisted students with course schedules, study skills, program requirements, and career decisions. Pre-nursing and nursing students identified program and curricular knowledge as the most essential characteristic of effective advisors. Being approachable, available, and friendly were also key to students (Harrison, 2009a). Advisors, mentors, tutors, technology, and courses are among the resources used to assist and support students at the pre-nursing level

Program Support

Program support was defined as academic support provided to students, who are admitted to a nursing program, that contribute to their persistence. This included assistance or enrichment provided to students from peers, faculty, including mentoring and tutoring, and courses designed to address academic or study deficiencies for student enrolled in a nursing program. Nursing students often require the same academic and institutional support as incoming freshmen, including access to libraries, computer labs, academic services, faculty and staff. As stated earlier, many students experience a period of transition when entering higher education; another period of transition occurs when students begin nursing school (Straker & Kelman, 2007). Many students struggle as evidenced by the high attrition rate among first semester nursing students (Wolkowitz

& Kelley, 2010). Wells (2003) suggested an institutional culture that supports student retention through early recognition and intervention of at-risk students, a curriculum that addresses the diverse cultural and academic needs of students, and a student success program that allows faculty workload allowance and availability resources to the students. Program support in nursing school "may include peer tutoring, course content review sessions, personal and academic counseling, study skills workshops, and other student support programs" (Hopkins, 2008, pg. 258).

Technological support in nursing programs. Technological support was defined as "access to and assistance with computers, equipment, and skills needed to conduct research" (Cason et al., 2008, pg. 47). Students reported technical support as the least important contributor to persistence in nursing school (Bond et al., 2008); however, lack of technological resources was considered a barrier to persistence. Edwards and O'Connor (2011) described the use of computer training and technology resources among nursing students in a community college to increase student retention. The goal to increase computer competency was achieved through interactive modules which gave the students self-guided instruction related to learning management systems, clinical assignment tutorials, electronic communication, and general information about nursing school. Students reported the use of this technology improved their test taking skills, and a lower attrition rate was seen following the implementation of these new technological resources. Non-traditional students in an associate degree program reported that "college facilities (nursing skills laboratory, library, and computer lab)" were supportive components of their retention (Jeffreys, 2007a, pg. 79).

Simulation has been used in nursing and medical education for years to enhance learning and as a method to achieve learning goals (Gaba, 2004). Simulation has been defined as a teaching strategy to evaluate student performance (Mills et al., 2014) and a technique to promote patient safety through interactive activities (Gaba). Glidewell & Conley (2014) reported higher test scores when nursing students worked with high fidelity simulators to learn renal and cardiac content. No other studies that focused on simulation and academic support were found.

Coaching, mentoring, and tutoring. Mentoring may contribute to program success among nursing students (Dorsey & Baker, 2004). Both faculty and peer or student mentoring and tutoring have been effective strategies to increase program persistence. Sixteen senior level nursing students participated in a descriptive study as researchers explored factors related to students who were at risk for program failure (McGann & Thompson, 2008). Faculty mentored these students as they met weekly and worked on time management and test taking skills. A significant improvement in the mean GPA was attributed in part to faculty mentoring. Peer or student mentoring has also been implemented as an intervention to increase persistence among beginning nursing students who had a GPA of 2.3-2.8, or who had failed a bioscience or nursing course (Robinson & Neimer, 2010). The mentor-tutor, a student who had successfully earned an A or B in a course, met twice weekly for two hours with three to five students. When low performing mentees, students who participated in the mentoring program, interacted with and learned from peer mentors, they tended to be more successful. Additionally, mentees had significantly higher test scores throughout the school year than the control group and were more likely to persist (Robinson & Niemer). Potolsky et al. (2003) used a

descriptive correlational design to examine the relationship between nursing students' (n =37) first semester grades on two items: tutoring and prerequisite science course grades. Students' prerequisite science grades were found to be predictive of the nursing students' first semester grades; however, no correlation was found between tutoring sessions and semester grades. The small sample size may have contributed to that outcome.

Student and faculty mentoring can contribute to student success. Students reported lower levels of test anxiety, increased self-confidence and self-esteem, and benefitted from the honest, positive feedback from the mentoring. Mentors and tutors can provide additional instruction and support students who are having difficulty with nursing courses (DeLapp et al., 2008). Students wanted faculty to recognize their individual needs, to give emotional support and to be available. Faculty who were approachable, caring, patient, and treated students with respect are perceived as supportive, while students perceived unsupportive faculty as uncaring, unapproachable, insensitive to their needs, and unaware of their cultural needs (Gardner, 2005).

Perceived support, from either family or faculty, was identified as a contributor to program success (Shelton, 2012). When nurse educators were able to listen and interact with students, providing support and being present to their emotional needs (Poorman, Mastorovich, & Webb, 2011), some of the students were successful academically.

Tutoring, counseling services, interactions with faculty, advisors, and other students were found to contribute to retention in nontraditional nursing students (Jeffreys, 2007a). Researchers did not find a strong correlation between mentoring and GPA or a significant difference in nursing school persistence; conversely, lack of faculty support has been found to increase attrition rates among minority students (Gardner, 2005). A

detailed orientation program, feedback from successful graduates, faculty mentoring, and information on financial and counseling resources for students in an accelerated baccalaureate program were found to increase persistence (Rouse & Rooda, 2010).

Most nursing schools have competitive GPA requirements; however, many students enter nursing school without the tools needed to persist and graduate (Straker & Kelman, 2007). Standardized tests help determine the students who are most likely to succeed in nursing school and to identify those who are not prepared academically. The Test of Essential Skills [TEAS] (Newton et al., 2007), Nurse Entrance Test [NET] (Hopkins, 2008; Symes, Tart, & Travis, 2005), or Health Education Systems Incorporated [HESI] (Chen & Voyles, 2013) have been found to be good predictors of academic success and persistence; they have also been used to identify students who are at-risk for failure or not persisting in a nursing program. Knauss & Willson (2013) found moderate correlations between HESI scores and first semester course grades; the higher the Admission Assessment HESI scores, the higher the final course grades. Similar findings were reported among first semester baccalaureate nursing students who took the HESI as an admission requirement (Underwood, Williams, Lee, & Brunnert, 2013) Admission GPA and TEAS results, which both measure nursing aptitude, were predictive of first semester nursing school success (Newton et al., 2007). Hopkins (2008) recommended using NET results as a criterion for remediation. When students struggle, they often lack the essential skills needed for persistence. These skills include but are not limited to math skills, study skills, test taking skills, time management skills, and communication skills, either written, verbal, or both (Symes, Tart, Travis, & Toombs,

2002). Students whose first language is not English may also have difficulty persisting (Carr & Dekemel-Ichikawa, 2012; Hansen & Beaver, 2012).

Nursing support courses. Poor time management, inadequate study skills, and ineffective test taking strategies put nursing students at risk for failure (Jeffreys, 2012). Academically unprepared students tend to withdraw or drop out of nursing school (Shelton, 2012) Early identification and proactive strategies were consistently reported as very important factors that can influence persistence (Newton et al., 2007; Peterson, 2009). Courses developed to focus on at risk student deficiencies (Harding, 2012) as well as ongoing faculty assistance, such as providing students with educational tools to improve grammar, basic math, and reading comprehension, could contribute to nursing students' academic success (White, 2004). Interventions developed by nursing faculty to assist senior level nursing students with time management, study skills, and self-help activities, such as journaling were found to increase retention (McGann & Thompson, 2008).

Designated nursing faculty support. Lack of institutional support was cited as one reason for high attrition rates among students who needed remedial assistance (Igbo et al., 2011). In an effort to provide academic support and socialization into the profession of nursing, a multifaceted, multidisciplinary program between three nursing programs was initiated to improve persistence rates of at-risk nursing students. Criteria for at-risk students correlated with federal standard of disadvantaged student: first person in the family to attend college, qualified for financial assistance, admission GPA, and NET scores. Over the three year period, 105 students participated in the nine month program that provided a variety of activities for students were in their first year of nursing school.

Activities included writing workshop, communication sessions, socialization, medical terminology, critical thinking, career coaching, and study skills sessions which taught time management, testing tips, study tips, and stress reduction (Igbo et al.). The persistence rate increased.

When one third of first semester minority nursing students failed courses in a large baccalaureate nursing program in Texas, a Student Success Program (SSP) was established to assist at-risk nursing students, those who had low standardized admission test scores in reading comprehension, succeed in nursing school (Symes et al., 2002). An additional semester was added to the curriculum to focus on the academic deficiencies. Nursing faculty taught the one hour independent study nursing course that addressed study and math skills, test taking skills, time management skills, and communications skills. Students completed the course prior to enrolling in clinical courses. Persistence rates have greatly improved as a result of this course, increasing from 48% to 81% (Symes et al., 2005).

Another Texas university established a SSP when NCLEX pass rates began to drop in 2004 (University of Texas at Arlington College of Nursing, 2013). Students are mandated to meet with SS Coordinators if their grade is less than 70% on any nursing exam and 90% on math tests. Persistence rates have been 89% or higher since 2009. In 2012, the College of Nursing SS Coordinators developed a required course to assist nursing students who have failed a nursing course or who have scored less than 750 on two specialty course HESIs. The course focused on time management skills, study skills, and test taking strategies. Early results show overall student improvement their HESI

scores during semester they took the course, but continual tracking is needed (Flores & Cope, 2013).

Summary

Addressing students' needs, using multiple resources, was found to aid in student persistence (Lawrence, 2007; Norman et al., 2005). Institutional support, such as library services, was found to increase persistence when students accessed them early in the semester and used them frequently. Researchers (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008; Tinto, 2012) attribute low persistence rates in college to poorly prepared students who lack the essential skills needed to persist in higher education. Academic support, whether through tutoring, advising, coaching, mentoring, or through courses designed to help freshmen students' transition to college, has been found to help students succeed and persist in higher education (Kuh et al., 2008; Robertson & Mason, 2008), although not consistently (Baker & Griffin, 2010). Frequent encounters with mentors or tutors produced higher persistence rates (Hu & Ma, 2010). Early intervention, such as an introductory course that teaches time management and study skills, appears to increase student persistence. Most studies focus on one resource or strategy to increase persistence; however, few researchers have examined the relationship between multiple resources and student persistence.

A prescription for academic success and persistence throughout nursing school was not clearly identified in this literature review. Institutional support provides academic assistance to students in higher education reach their academic goals (Jeffreys, 2012). Issues that impede academic performance are poor time management skills, inadequate study skills, and ineffective test taking strategies (Straker & Kelman, 2007). Student

success courses have been shown to increase persistence (Symes et al., 2002), but not consistently (Harding, 2012).

The high attrition rate among first semester nursing students is well documented (Potolsky et al., 2003; Wolkowitz & Kelley, 2010), but little research has identified the association between program support and persistence. Identifying which resources are available to students and whether specific resources contribute to persistence are not known. Researchers have found a positive correlation between nursing faculty interactions and nursing student persistence at the course level, but this has not been studied at the program level. Limited research has been conducted on the impact of academic support activities and resources on persistence.

Thousands of students are admitted into nursing programs every semester. In Texas, three out of ten students do not persist and graduate. Examining the association between academic support and nursing school persistence may provide data to identify which resources are most likely to help to students succeed. Retention efforts are more effective when started early in the nursing program (Symes et al., 2005) The first step is determining student deficiencies so remedial or support measure may be implemented early in nursing school. Delaying support may lead to attrition. Persistence has been attributed to early and ongoing interventions that providing academic assistance through peer and faculty interactions, such as tutoring and mentoring; courses that focus on academic preparedness, including study skills, time management, and test taking skills may be beneficial (Straker & Kelman, 2007).

A strong correlation exists between high GPA and nursing student persistence; however, many other factors contribute to persistence. While most of the researchers

have focused on specific activities, a gap exists to the overall impact of academic support and pre-licensure nursing student persistence. Therefore, this study will focus the association between support (institutional, pre-program, and program) and nursing school persistence.

Chapter3

Introduction

This descriptive exploratory study examined the academic factors that contributed to pre-licensure nursing student persistence, and examined the association between these factors and persistence in pre-licensure nursing programs. A description of the research design, sample and setting, survey tool development, measurement methods, ethical considerations, and delimitations of the study will be provided in chapter three.

Research Design

A descriptive exploratory design was used to describe the factors that impact student persistence and the association of these factors on student persistence. Few researchers have focused solely on academic factors that contribute to pre-licensure nursing student persistence from a program perspective. A descriptive research design is used when gathering initial data on a topic and describing the variables (Hulley, Cummings, Browner, Grady, & Newman, 2007). Correlation research examines associations between variables and the strength of the association (Burns & Grove, 2009).

Sample

The target population was Texas nursing programs who educate pre-licensure nursing students; students who upon graduation are eligible to take the national licensing exam (NCLEX-RN). Program directors or deans were queried as to the persistence rate, the on time graduation of students in their program. On-time graduation is defined as completing a licensed vocational nurse (LVN) to associate degree nursing (ADN)

program within 18 months after admission to nursing school or completing a four semester program, which include ADN, bachelor of science in nursing (BSN) or diploma program within 36 months (Texas Board of Nursing, 2010).

Inclusion criteria Inclusion criteria were pre-licensure RN programs approved by the Texas Board of Nursing: Diploma, ADN, BSN, and master entry level programs. For the four semester programs, students would have begun the program by fall 2010. For the one year LVN to ADN programs, students would have begun the program spring 2011. Exclusion criteria include pre-licensure RN programs who have not had students graduate from their program within the timeframe defined (Texas Board of Nursing, 2013b)

Sample Size

In 2013, there were 113 approved pre-licensure RN programs in Texas: one diploma program, 67 associate degree programs, 44 baccalaureate programs, and one Master of Science in Nursing Alternate Entry (MSNAE) program; however, 20 of these programs have not had their first class of graduates or students eligible to take NCLEX (Texas Board of Nursing, 2013b) and therefore, were excluded from the study. The dean for the MSNAE program is also the dean for a BSN program and another dean/director was responsible for an ADN and BSN program. These program leaders were sent separate emails to each program; the same email addresses were used. A non-random convenience sampling will be used to collect data from deans, directors, or designated faculty based on the contact information located on the TintoTinto (2013b) website of Approval Professional Nursing Programs.

Sample Setting

Deans and directors of 93 qualified Texas pre-licensure nursing programs were emailed the Academic Factors Influencing Nursing Student persistence survey (AFINS) survey, to their faculty email address, using a Qualtrics link. Qualtrics is computer software that was used to collect research data through a secure database (Qualtrics, 2013). Contact information for the deans of each pre-licensure nursing program was listed on the BON website. The survey was active for four weeks; it was launched on December 21, 2013 and closed on January 22, 2014. A reminder email with the survey link was sent on January 6, 2014 and again on the January 17, 2014.

Measurement Methods

A tool that measured the construct of academic support for pre-licensure nursing students was not found; therefore, a tool was developed using the Delphi technique and the assistance of five content experts. In this section, tool development will be described first, including the criteria for content experts, and then the construction of the two rounds of surveys will be discussed. Based on the response of these two rounds of surveys, the AFINS survey was created.

Tool development

The initial step for developing an academic support tool was based on the literature review described in chapter 2 and the results of the THECB survey, which was used to evaluate pre-licensure nursing programs in Texas (Texas Higher Education Coordinating Board [THECB], 2006). Institutional support, pre-program support, and program support were identified as potential contributors to pre-licensure nursing student persistence and divided by individual items into those categories. The second step was to

determine the experts who could evaluate the usefulness of each item using the Delphi technique.

Inclusion criteria for content experts. Prior to sending the first round of surveys, criteria for content experts were established. Criteria for experts should correlate with the focus of the study and their level of expertise explained in the study (Vernon, 2009). For this study, each expert was required to have a minimum education preparation level of a master's degree, was required to have five years of experience in higher education, and must have frequent student contact, which was defined as a minimum of 10 contact hours per week. The experts needed to have an education level that allowed for employment in institutions of higher learning, to have experience interacting with students in higher education, and to understand how these needs may have changed or remained the same over time. The criteria for participation were listed at the beginning of each survey round, and participant demographic data were collected at the conclusion of the survey. Although an ideal number of experts is not known, Vernon (2009) suggested a minimum of four experts. Content experts were recruited from pre-licensure nursing programs and faculty engaged in academic programs at the university level. Five experts agreed to participate in the tool development; all five experts participated in both rounds of the survey.

Delphi Technique. The Delphi technique was used to achieve consensus on topics that have not been well-researched or when limited information is available (McKenna, 1994). Information is gathered and evaluated through rounds of questioning. Consensus was reached when there is 80% or higher agreement between the experts who participated in the survey or questionnaire (Worth, Nurmatov, & Sheikh, 2010). A

minimum of two rounds was needed to determine the necessary items for the final questionnaire. The first round of questions was used to gather information and to ask for input from experts on the identified topic (Keeney, Hasson, & McKenna, 2006). In the second and subsequent rounds, the experts were provided with the overall feedback from the previous round or rounds and queried on new and previous items (Vernon, 2009).

Round One. The initial survey consisted of 37 items, which were subdivided into three types: institutional support, pre-program support, and program support. Definitions were provided prior to the category items. See table 3.1. The goal of the survey was to identify which items are essential for student persistence; therefore the options for all of the questions were: Essential to student persistence; useful, but not essential to student persistence; or not necessary for student persistence. Text boxes were available at the end of the support type, which allowed expert input. The comments are reported in Appendix A. Additional questions, based on these comments were included in the Round Two of the survey. All the results from Round One are reported in Appendix B:

Table 3-1 Round one: Concepts measured using the Delphi technique

	Conceptual definition	Operational definition Round One (37 items)
Persistence	Ability of nursing students to complete required course work in a pre-determined time frame.	Completing LVN to ADN nursing program within 18 months after admission to nursing school or completing a four semester programs within 36 months (Texas Board of Nursing, 2010). Four semester programs include ADN, BSN, and Diploma.
Institutional support	Institutional support was defined as the students' right to use physical or material resources, such as library resources and computer labs.	Six items on the Academic Factors Influencing Student Persistence initial survey: Three items related to technology resources; Three items related to library resources.
Pre-program support	Pre-program support was defined as assistance or enrichment provided to students from peers, faculty, including mentoring and tutoring, and courses designed to address academic or study deficiencies at the university level and not specific to the nursing program or nursing school.	17 items on the initial survey: Four items address specialized development or introductory courses Four items related to specialized labs Five items related to tutoring program Three items related to mentoring One item related to academic advisors
Program support	Program support was defined as assistance or enrichment provided to students from peers, faculty, including mentoring and tutoring, and courses designed to address academic or study deficiencies during a nursing program or when students are enrolled in nursing school.	14 items on the initial survey: Four items address technological support Three items are related to specialized nursing course Four items related to tutoring Two items related to mentoring One item related to designated faculty

Each item on the survey was scored on its merit as being essential, useful, or not necessary to student persistence. Experts scored all items as either essential or useful to student persistence; none of the items were scored as "not necessary to student persistence". To calculate the item score, the total number of responses per item was divided by the five, the number of experts. For example, within the category of institutional support, four of the five experts believed computer labs were essential to student persistence; the recorded score was 80% for that item (see Table 3.2). Twelve items achieved a 80% score or higher in Round One. The total number of items that were in each category is listed.

Table 3-2 Results from Round One: Items with 80% agreement or higher

Type of Support	Item	Description of item	Percentage of Agreement
Institutional Support (4)/6	Technology	Computer labs	80
	Technology	Computer resources	80
	Library resources	Availability of online resources	80
	Library resources	Availability of library resource	80
Pre-program Support (4)/17	Special develop/intro course	Study Skills	100
	Special develop/intro course	Writing	80
	Specialized labs	Language lab for ESL students	80
	Advisors	Academic advisors	100
Program Support (4)/14	Technology support	Computer resources	80
	Technology support	Simulation	80
	Tutoring at program level	Test prep sessions	80
	Designated nursing faculty	Workload is student success/ student persistence	80

Round Two. The second round of the survey consisted of 44 items. The questions from Round One remained the same; scores from Round One were provided with each question. If consensus was reached on a question during Round One, that information was provided, along with a question verifying their opinion had not changed. The experts could decide to change their answer, although the answer options remained consistent.

Comments from Round One were added to the survey (see Appendix A); however, two expert comments given in Round One were not included in Round Two. Student advising and academic advising were deemed to be identical and academic advisor was part of academic support. Definitions for Round Two are provided in Table 3.3. Development of intrinsic motivation and positive attitude toward lifelong learning were constructs that the researcher believed could not be measured.

Table 3-3 Round Two: Concepts measured using the Delphi technique

	Conceptual definition	Operational definition Round Two (44 items)
Persistence	Ability of nursing students to complete required course work in a pre-determined time frame.	Completing LVN to ADN nursing program within 18 months after admission to nursing school or completing a four semester programs within 36 months (Texas Board of Nursing, 2010). Four semester programs include ADN, BSN, and Diploma.
Institutional support	Institutional support was defined as the students' right to use physical or material resources, such as library resources and computer labs.	Nine items on the Academic Factors Influencing Student Persistence initial survey: Three items related to technology resources; Three items related to library resources; three miscellaneous items.
Pre-program support	Pre-program support was defined as assistance or enrichment provided to students from peers, faculty, including mentoring and tutoring, and courses designed to address academic or study deficiencies at the university level and not specific to the nursing program or nursing school.	21 items on the initial survey: Seven items address specialized development or introductory courses four items related to specialized labs; five items related to tutoring program; three items related to mentoring; one item related to academic advisors; and one item related to counseling services
Program support	Program support was defined as assistance or enrichment provided to students from peers, faculty, including mentoring and tutoring, and courses designed to address academic or study deficiencies during a nursing program or when students are enrolled in nursing school.	14 items on the initial survey: Three items related to technological support; three items are related to specialized nursing course; four items related to tutoring; two items related to mentoring; and two items related to designated faculty support

Fourteen items were identified as being essential to student persistence by at least four of the five experts. See Table 3.4. A detailed report of the survey results will be presented in chapter 4.

Table 3-4 Results from Round Two: Items with 80% agreement or higher

Type of Support	Item	Description of item	Percentage of Agreement
Institutional Support (3)/9	Technology	Information technology (IT) personnel to assist with applications that students need	80
	Library resources:	Accessibility of library resources	80
	Support personnel	Faculty who are student friendly	100
Pre-program Support (6)/21	Special develop/intro course	Test taking skills	80
	Special develop/intro course	Study skills	80
	Special develop/intro course	Critical thinking	100
	Specialized lab	Math	80
	Specialized lab	Students whose first language is not English	80
	Advisors	Academic advisors	100
Program Support (6)/15	Technology support	Simulation	100
	Specialized nursing courses	Test taking skills	80
	Specialized nursing courses	Time management skills	80
	Specialized nursing courses	Study skills	80
	Tutoring at program level	Test prep sessions	80
	Designated nursing faculty	Workload is Student persistence	100

Scoring of the survey. The Delphi technique was used with the goal of reaching consensus on the studied items; two rounds were needed. Waltz, Strickland, and Lenz, (2005) have reported .80 (80%) as an acceptable score for content validity. Polit, Beck, & Owen, 2007 suggest a content validity per item of 0.78. For this study, a consensus was set, a priori, at 0.8, meaning four of the five experts would need to agree that a

component was essential to pre-licensure nursing student persistence to be included in the AFINS survey.

AFINS survey. Based on the collective responses of Round Two, 15 questions had a level of agreement of 80% or higher (see Table 3.5); however the question related to specialized-labs for students whose first language is not English was unintentionally omitted from the AFINS survey. Fourteen items were included in the AFINS survey, as essential components, of pre-licensure nursing student persistence (see Appendix E). The survey was distributed through an electronic mail (email) link, powered by Qualtrics, to deans, directors, or designated personnel of 93 qualifying nursing programs in Texas. Program qualifications included Texas Board of Nursing approved associate degree, diploma, baccalaureate degree, and master entry level programs; students must have completed the program and must have been eligible to take the NCLEX-RN. Nursing program personnel were asked to self-report their persistence rates as either meeting the 85% persistence rate benchmark or not meeting the 85% persistence rate benchmark.

Table 3-5 Conceptual and operational definitions for AFINS Survey

	Conceptual definition	Operational definition
Persistence	Ability of nursing students to complete required course work in a pre-determined time frame.	Completing LVN to ADN nursing program within 18 months after admission to nursing school or completing a four semester programs within 36 months (Texas Board of Nursing, 2010). Four semester programs include ADN, BSN, and Diploma.
Institutional support	Institutional support was defined as the students' right to use physical or material resources, such as library resources and computer labs.	Three items on the AFINS survey: One item related to library resources; two items related to personnel support
Pre-program support	Pre-program support was defined as assistance or enrichment provided to students from peers, faculty, including mentoring and tutoring, and courses designed to address academic or study deficiencies at the university level and not specific to the nursing program or nursing school.	Six items on the AFINS survey: Three items related to specialized developmental or introductory courses. Two items related to specialized labs. One item academic advisors.
Program support	Program support was defined as assistance or enrichment provided to students from peers, faculty, including mentoring and tutoring, and courses designed to address academic or study deficiencies during a nursing program or when students are enrolled in nursing school.	Six items on the AFINS survey: One item related to technological support; three items are related to specialized nursing course; one item related to tutoring/test prep sessions; and one item related to designated faculty support

Survey responses were dichotomous. Either the nursing program provided the academic support listed on the survey or the nursing program did not provide the support. Participants were asked to report their program persistence rate as less than 85%, or equal to/greater than 85%. Eighty five percent was chosen, as the benchmark, because it is recommended by the THECB (2006).

Demographic data questions related to pre-licensure nursing students were collected to determine the characteristics of students in each program. Questions included number of students in the program, age range, gender, ethnicity, prior education or degrees, and the admission criteria of the program. Admission criteria questions included the minimum GPA, both cumulative and science, for admission and use of standardized admission tests; if a standardized test was used, which one used and was a minimum score required. Finally, the numerical grade required to pass nursing courses was collected. In 2006, the THECB found a variance in passing numerical grade in nursing programs. This variance could impact the ability of students to persist. Answers to the demographic questions were reported as aggregate data.

Data Analyses

SPSS Statistical software (Version 22.) was used to analyze the study data. Descriptive statistics was used to describe the demographic data of students admitted into pre-licensure nursing programs in Texas. The answer choices in the AFINS are binary variables; therefore, descriptive statistics were computed to describe the academic factors. To test the hypotheses that institutional support, pre-program support, and program support contributed and are associated with pre-licensure nursing student persistence, odds ratio (OR) with confidence intervals (CI) were computed. OR with CIs were calculated because the dependent variable and independent variables were dichotomous (Gliner, Morgan, & Leech, 2009). The strength of an association was computed using ORs (Nunnally & Bernstein, 1994). The CI measures the precision of the OR (Hulley et al., 2007). A narrow range of results suggest that similar results would

occur with repeated studies, while a wide range of results suggest that different results would occur with repeated studies (Booth, Rees, & Beecroft, 2010).

An alpha of 0.1 was set apriori. With a fourteen item survey, the risk of a Type I error could be as high at 70%. The best method to reduce a Type I error is to increase the sample size (Lieberman & Cunningham, 2009); unfortunately, the sample size was predetermined for this study. Increasing the alpha to .1 would reduce that risk (Shao & Feng, 2007).

Table 3-6 Statistical computations used to answer research questions

Research Question	Statistical Computations
What is the association between institutional support and pre-licensure nursing student persistence as self-reported by Texas nursing program deans and directors?	Descriptive statistics: frequency and percent; OR with 90 %CI
What is the association between pre-program support and pre-licensure nursing student persistence as self-reported by Texas nursing program deans and directors?	Descriptive statistics: frequency and percent; OR with 90% CI
What is the association between program support and pre-licensure nursing student persistence as self-reported by Texas nursing program deans and directors?	Descriptive statistics: frequency and percent; OR with 90% CI

Procedure

Following Institutional Review Board (IRB) approval from the University of Texas at Arlington, an electronic survey link administered through Qualtrics was sent to pre-licensure RN nursing program directors or deans in Texas with the goal of identifying academic factors that contribute to nursing student persistence. Directors or deans were identified through Texas BON website; the website provided email addresses for these individuals (Texas Board of Nursing, 2013b). Programs less than two years old were excluded as students will not have graduated from the program. Consent to participate in

the study was implied when respondents clicked on “accept” button; if they chose “not accepted”, the respondent was not permitted to complete the survey. With the follow-up email, respondents were asked not participate in the survey, if that had already participated (see Appendix D).

Aggregate demographic data of students enrolled in the program and admission requirements data were collected after the respondents completed the AFINS survey. Persistence rates were recorded as having met the State standard of 85% or higher, or were recorded as less than 85% which was below the standard. The risk for bias existed due to the non-randomized sampling (Šimundić, 2013) and the small sample size (Hulley et al., 2007). The IRB approval letter is provided in Appendix F.

Ethical Considerations

No personal student data were collected during this study. Aggregate program data that were collected received protection through security measures taken by Qualtrics. High-end firewall systems are used on the servers to secure data, and vulnerability scans are performed regularly (Qualtrics, 2013). Downloaded data was stored on either encrypted or password-protected computers.

Delimitations

Study does not address non-persisters, students who have withdrawn from nursing school, delayed graduation, changed majors, or failed out of the nursing program. Additionally, transfer students were not tracked. Students, who attended a nursing program that had not graduated their first class, were excluded from this study. The study was restricted to Texas pre-licensure RN program limiting generalizability beyond Texas. This study was limited to faculty perceptions of academic factors needed for student

persistence; students' perceptions were not included in this study. Finally, this study is limited to academic factors that contribute to nursing success, based on the AFINS survey. Other factors have been excluded from the study.

Summary

The descriptive correlational study was used to describe pre-licensure nursing students and to determine if there is an association between academic support and pre-licensure nursing student persistence. The AFINS survey, a tool developed using the Delphi technique, was used to identify the essential academic factors that contribute to pre-licensure nursing student persistence.

Chapter 4

Introduction

This chapter will be divided into two sections: results of the Delphi technique and results of the Academic Factors Impacting Nursing Student persistence (AFINS) survey. First, the characteristics of the content experts, scoring of the survey items, and the results of each round of the Delphi technique will be reported. Next, based on the AFINS survey, the overall characteristics of students enrolled in the nursing programs will be reported; followed by the results the study survey. Within the AFINS survey results, the definition of each type of support will be given; then, results of the academic support provided to students within each domain will be reported. Finally, reporting the results related to the three research questions and persistence rates will be provided:

1. What is the association between institutional support and pre-licensure nursing student persistence as self-reported by Texas nursing program deans and directors?

2. What is the association between pre-nursing program support and pre-licensure nursing student persistence as self-reported by Texas nursing program deans and directors?

3. What is the association between nursing program support and pre-licensure nursing student persistence as self-reported by Texas nursing program deans and directors?

Academic support was defined as assistance and resources provided to college students, which incorporated institutional support, pre-program support and program support. Academic support was separated into three categories: institutional support, pre-program support, and program support.

Institutional support was defined as the students' right to use physical or material resources, such as library resources and computer labs. Pre-program support was defined as assistance or enrichment provided to students from peers, faculty, including mentoring and tutoring, and courses designed to address academic or study deficiencies at the university level and not specific to the nursing program or nursing school. Program support was defined as assistance or enrichment provided to students from peers, faculty, including mentoring and tutoring, and courses designed to address academic or study deficiencies during a nursing program or when students are enrolled in nursing school.

Delphi Technique

Determining the essential academic components needed for student persistence was ascertained through two rounds of questioning using the Delphi technique. Five content experts were recruited to participate; all five experts participated in both rounds of query. Vernon (2009) suggested a minimum of four experts. Having five experts allowed for 80% (.8) agreement, if four out of five experts reached consensus. Four of the experts were nurse educators and the fifth worked with students in the university setting; this provided a different perspective of students' needs. The statement, "participation and completion of this survey implies your informed consent", was included in Qualtrics online survey. No student data or human subject information were collected (Buelow, 2011). As seen in Table 4.1, each expert met the criteria of having an education level of either a masters or doctoral degree; worked in higher education for a minimum of five years; and worked with students for a minimum of 10 hours a week.

The goal of the Delphi technique is to reach consensus among the experts (Keeney et al., 2006). A minimum of two rounds of questioning is used with the Delphi technique (Bond & Bond, 1982). The first round is for idea and information gathering (Hasson, Keeney, & McKenna, 2000). In Round One, the content experts could add comments or items they believed were essential. An open-ended question, "other supports that are essential to student persistence", was placed at the end of each type of support section (institutional, pre-program, and program); these comments are reported in Appendix A. In the second and subsequent rounds, the results of the previous round were provided to allow the experts to review the other experts' opinions and to modify or change their initial response (Sumsion, 1998).

Table 4-1 Demographic data of the content experts

Characteristics of Content Experts			
Level of Education	Master's prepared: Three		
	Doctorally prepared: Two		
	Sample size	Mean	Range
Years in Nursing	4	34.5	17-47
Years in Higher Education	5	19.4	5-33
Hours/week interacting or working with students	5	38	10-60

Scoring the survey items. The same scoring method was used for each round of questions. Consensus was reached when there was 80% or higher agreement between the experts who participated in the survey or questionnaire. Waltz, Strickland, and Lenz, (2005) have reported 80% as an acceptable score for content validity, and (Polit et al., 2007) suggested a content validity per item of 78%. For this study, a consensus was set

a priori, at 80%; therefore, four of the five experts would need to agree that a component was essential to pre-licensure nursing student persistence to be included in the AFINS survey.

Results: Round One. The questions for Round One were constructed based on the literature review and incorporated components of the framework, Academic Support: Model of Nursing Student Persistence. As noted above, academic support was defined as assistance and resources provided to college students, which incorporated institutional support, pre-program support and program support. Institutional support was subdivided into sections: technology and library resources. Pre-program support was subdivided into sections: specialized development or introductory courses, specialized labs, tutoring, mentoring, and advising. Program support was subdivided into sections: technology support, specialized nursing courses, tutoring, mentoring, and designated nursing faculty. Content experts were asked to determine whether an item was essential to student persistence, useful but not essential to student persistence, or not necessary to student persistence. At the beginning of each category of questions, the support definition was given. In Round One, the tool contained the following items: six institutional support, 17 pre-program support, and 14 program support items. Experts could provide additional open-ended comments of support items they considered essential to student persistence. The content experts' comments are provided in Appendix A and results from Round One are in Appendix B. Seven items were added to Round Two.

Of the six institutional support items, four were considered essential with an agreement of 80% or better; of the 17 pre-program support items, four were reported

essential with an agreement of 80% or better; and of the 14 program support items, four were considered essential with an agreement of 80% or better as seen in Table 4.2. Seven questions were added to Round Two of the questions based on content expert input. Three items were added to institutional support and four items were added to pre-program support. Additional items were not added to program support.

Results: Round Two. The second round of questioning was similar to the first but included the seven new questions. The three types of academic support definitions were repeated and the cumulative results/overall scores percentage of agreement for each question in the first round were listed for each applicable question. One subsection was added to institutional support: faculty, and one subsection was added to pre-program support: counseling services. The new questions that had not appeared on the Round One survey did not have a score associated with them. As suggested by Hasson et al., (2000), the degree of agreement from Round One was included with the question. Including the overall scores from Round One allowed the experts to consider the opinion given by the other content experts and modify their answers based on this input, or they could keep their original rating. The identical scale was used to classify each expert's response: essential, useful but not essential, and not useful. To ensure content validity, four of the five experts must agree that the item was essential to student persistence; a degree of agreement of 80% or higher was the criterion for inclusion in the AFINS survey. After Round One, twelve items were deemed essential. Following Round Two, the content experts deemed 15 items as essential which included three of the seven new items added. See Table 4.2. The content experts reported all items as either "essential to student persistence" or "useful, but not essential to student persistence". None of the

content experts reported the items as “not necessary for student persistence”. All the results from Round Two are in Appendix C.

Table 4-2 Responses from Round One and Round Two indicating essential components

Type of Support	Component Item	Round One	Round Two
	Institutional Support		
Technology	Computer labs	80%	60%
	Computer training	0	0
	Computer resources	80%*	60%
	Learning Management System	NA	60%
	IT personnel available to assist with applications that students use	NA	80%*
Library resources	Number of books & resources available	20%	20%
	Availability of online resources	80%*	60%
	Accessibility of library resources	80%*	80%*
Faculty	Faculty who are student friendly	NA	100%*
	Pre-program Support		
Specialized development or introductory courses that teach:	Test Taking Skills	60%	80%*
	Time Management Skills	60%	60%
	Study skills	100%*	80%*
	Library skills	40%	40%
	Self-care	NA	60%
	Finance & budget	NA	20%
	Critical Thinking	NA	100%*
Specialized Labs	Math	60%	80%*
	Reading	20%	20%
	Writing	80%*	40%
	Students whose first language is not English	80%*	80%*
Tutoring	Tutoring program	60%	60%
	Peer tutoring	0	0

Table 4.2 Continued

	Faculty	40%	40%
	Supplemental instructors	40%	20%
	Teaching assistants	20%	0
	Peer tutoring	0	0
	Faculty	40%	40%
Mentoring	Program	0	0
	Peer mentors	0	0
	Faculty mentors	60%	60%
Advisors	Academic advisors	100%*	100%*
Counseling Services	To deal with stress management issues	NA	60%
	Program Support		
Technology support	Library resources	60%	60%
	Computer labs	60%	60%
	Computer resources	80%*	60%
	Simulation	80%*	100%*
Specialized nursing course that teaches:	Test Taking Skills	60%	80%*
	Time Management Skills	60%	80%*
	Study skills	60%	80%*
Tutoring	Peer tutors	0	0
	Faculty tutors	60%	40%
	Supplemental instructors	20%	20%
	Test prep sessions	80%*	80%*
Mentoring	Peer mentors	0	0
	Faculty mentors	60%	60%
Designated nursing faculty	Workload is student success/student persistence	80%*	100%*

NA indicates the question was added to Round Two questioning

*Denotes essential

conti

Summary of Delphi Technique

After two rounds of surveys, the content experts identified 15 items that they considered essential to student persistence, three institutional support items, six pre-program support items, and six program support items. The question related to a specialized lab for ESL students was unintentionally omitted from the AFINS survey; therefore, a total of 14 items comprised the survey. The content experts changed their initial response on several questions. The reason for the change was not reported. In Round Two, all answer choices were closed ended, multiple-choice responses: essential to student persistence; useful, but not essential; or not necessary.

Of the six original institutional support items in Round One and nine items in Round Two, three items of institutional support were identified as essential to student persistence: 1).library resources that are accessible to students (80%) 2).IT personnel are available to assist with applications that students need (80%) 3).faculty who are considered student-friendly (100%).

Institutional Support Items

Three items were scored as essential. All the deans and directors reported that their institution provided the essential items listed in the AFINS survey.

Pre-Program Support Items

Four items were identified as essential in Round One: introductory courses that teach study skills, specialized writing labs and ESL labs, and academic advisors; however, after Round Two, writing labs were no longer ranked as essential. Four new items were added in Round Two: self-care, budget and finance, critical thinking, and

counseling services. The final analysis revealed that a total of six items of pre-program support were considered essential to student persistence: 1). test taking (80%); 2) study skills (80%); 3) critical thinking skills (100%); 4) specialized labs that address math (80%); 5) labs for students whose first language is not English (80%); and 6) academic advisors (100%).

Labs for students whose first language is not English (ESL) was unintentionally omitted in the AFINS survey; therefore, deans and directors were not queried about ESL resources. This omission reduces the number of items in the pre-program support to five. The math and test taking scores increased from essential 60% in Round One to essential 80% in Round Two.

Program Support Items

Four items were reported as essential for student persistence in Round One: computer resources, simulation, test prep sessions, and designated faculty whose workload is student persistence. In Round One, computer resources were ranked essential by 80% o f the expert, but the ranking was reduced to 60% in Round Two. No new items were added by content experts to Round Two. A total of six items were deemed essential for nursing school persistence: 1) simulation (100%); 2) test taking skills (80%); 3) time management skills (80%); 4) study skills (80%); 5) test prep sessions (80%); and 6) designated faculty, whose workload is dedicated to student success/student persistence (100%).

Results: AFINS Survey

Following IRB approval from the University of Texas at Arlington, the 14-item survey created in Qualtrics was distributed to the 93 study-eligible Texas deans and

directors via their program email addresses. IRB approval is found in Appendix . These addresses were posted on the Board of Nursing public website (Texas Board of Nursing, 2013b). Study-eligibility was defined as programs who had graduated their first class of pre-licensure nursing students; these students were eligible to take the National Council Licensure Exam for Registered Nurses (NCLEX-RN) exam. Participation request emails and survey links were sent to the program email addresses on three separate occasions: December 21, 2014, January 6,2014, and, January 17, 2014. On the second and third request, participants who had completed the survey were thanked for their input and were instructed not to complete another survey.

In the introduction email, deans and directors were asked to participate in the study, as they were in a unique position to provide information about their resources and persistence rates (see Appendix D). The timeframe for the data collection, which was based on the type of program and length of program, was included in the participation request email and in the introduction to the study, prior to question one. For one year LVN to ADN programs, 18 months was the timeframe, spring 2011 to fall 2012; with four semester programs including ADN, BSN, Diploma, and MSN Alternate Entry Programs, 36 months was the timeframe, fall 2010 to summer 2013.

Demographic sampling. A total of 40 program respondents (41.9%) participated in the survey and answered one or more questions; three respondents agreed to participate in the survey, but did not answer survey questions. Eight to ten respondents did not answer the demographic and persistence questions. Neither the diploma nor master entry program participated in the study. Twenty-two ADN programs or 37 % of the 59 eligible ADN programs in Texas and nine BSN programs or 28 % of 32 eligible

programs in Texas contributed to the study. A majority of programs were ADN, students were female; some programs very diverse, while other very homogenous. As shown in Table 4.3, the minimal grade to pass varied, although a standardized passing grade was suggested by the THECB (2006). See Table 4.3

Table 4-3 Demographic Data: Programs that Participated in the Study

Characteristics of Programs				
Type of Program	N	Mean	%	Range
ADN	22		71	NA
BSN	9		29	NA
Diploma	0		0	NA
Masters Entry Level	0		0	NA
Annual enrollment	30	102		40-300
Age	28	29.6		17-63
Gender: Female	30		87	70-99
Ethnicity				
African American	24		1-33	
American Indian/Alaska Native	2		0-1	
Native Asian/Pacific Islander (n=20)	20		0-5	
Hispanic	23		1-79.9	
White	23		1.1-90	
Native Hawaiian/ Pacific Islander	18		0-3	
Asian	18		0-21	
International	17		0-9	
Multiracial	17		0-1	
Unknown	14		0-100	

Program admission requirements varied (See Table 4.4). A majority of programs required an admission test (87%); most programs used the Health Education Systems,

Inc. Admission Assessment (HESI A2) or Test of Essential Academic Skills (TEAS). The minimal grade to pass varied, although a standardized passing grade was suggested by the THECB (2006)

Table 4-4 Nursing program admission requirements

Program Requirements				
Admission Requirements	N	Mean	Range	%
Admission GPA	27	2.5	2.0-3.0	
Science GPA	27	2.5	2.0-3.0	
Passing Requirements				
Numeric grade to pass courses	28	74.2	70-80	
Admission exam:				
Exam requirement?(Yes)	30			86.7
Admission exam used				
ACT	1			3.9
HESI A2	12			46.2
Kaplan	1			3.9
TEAS	2			46.2

AFINS Statistical Results

The association between different types of academic support and student persistence will be presented as odds ratios (OR) with the confidence intervals (CI). Descriptive statistics were computed for the study results (see Table 4.5, Table 4.6, and Table 4.8). The AFINS survey responses were dichotomous. If the resource was provided, the item was scored as one and if the item was not provided, the item was scored as two.

Odds ratios (OR) with confidence intervals (CI) were computed to determine the association of academic support and nursing student persistence. Odds ratios with CIs were only computed for items with variability; results are shown in Table 4.7 and Table

4.9. Eight respondents (20.5%) did not answer the question related to their program persistence rate, as seen by the discrepancy in the sample size. Missing data were handled using listwise deletion (Kang, 2013). If the persistence rate was not recorded, that respondent's data were excluded from the OR and CI computations. Listwise deletion does decrease the sample size and potentially introduces bias (Kang).

Following the completion of the 14-item survey, respondents were asked to report demographic data related to their program and the persistence rates based on the length and type of program (see Table 4.3). The definition given with the persistence question differed from the timeframe provided in the participation email and introduction to the study. The ADN programs timeframe was defined as 18 months after admission and diploma, BSN, and masters level programs listed as 36 months. AFINS survey can be found in Appendix F. Most ADN programs are four semesters; therefore the persistence rate should have been 36 months. This failure to answer the question may have been related to one or more issues: 1) lack of data according to one respondent, 2) discrepancy between the initial persistence definition and definition provided with the question, or 3) placement of the persistence question in the survey.

AFINS Results

A definition of the type of support will be reported first, followed by the program results. The persistence rates were reported by the deans and program directors as less than 85% or equal to 85% or higher as suggested by the THECB (2006).

Institutional Support. Institutional support was defined as the students' right to use physical or material resources, such as library resources and computer labs, and the support personnel who provide these services. As shown in Table 4.5, three items in the

AFINS survey were related to institutional support. All of the participants (100%) reported their program had library resources that are accessible to students, IT personnel to assist with applications that students need, and faculty who are considered student friendly.

Table 4-5 Descriptive Statistics: Institutional Support

Institutional Support	
AFINS survey question	N (percentage of agreement)
Does your institution have library resources that are accessible to your students?	39 (100)
Does your institution have IT personnel to assist with applications that students need?	39 (100)
At your institution, are your faculty considered student-friendly?	38 (100)

OR and CI were not computed for institutional support. All surveyed programs provided these resources to their students.

Pre-program support. Pre-program support was defined as assistance or enrichment provided to students from peers, faculty, including mentoring and tutoring, and courses designed to address academic or study deficiencies at the university level prior to admission into a nursing program or nursing school. With the omission of the ESL item, five items in the AFINS survey were related to pre-program support (see Table 4.6); four of the items related to specialized development or an introductory course that taught a skill, and the fifth item was related to use of academic advisors.

Table 4-6 Descriptive Statistics: Pre-program Support

Pre-program Support	
AFINS Survey Items	N (percentage of agreement)
Does your institution offer specialized development or introductory courses that teach: test taking skills?	39 (76.5)
Does your institution offer specialized development or introductory courses that teach: study skills?	39 (87.2)
Does your institution offer specialized development or introductory courses that teach: critical thinking skills?	39 (66.7)
Does your institution offer specialized development or introductory courses that teach: math skills?	39 (82.1)
Does your institution have academic advisors?	39 (97.4)

Within pre-program support, four items were associated with student persistence. Positive associations were found between academic advisors and introductory courses that taught 1) study skills, 2) math skills, and 3) critical thinking skills. Pre-programs that had introductory courses with math skills were 2.9 times more likely to have students who persisted (OR=2.9; 90% CI: 2.79 -3.01). A majority (88%) of the deans and directors, who responded to the survey, reported that their programs provided the pre-program support of an introductory course that taught study skills. When programs provided this support, students were 2.54 times more likely to persist in the nursing program (OR= 2.54; 90% CI: 2.46, 2.63). When academic advisors were available to assist students, students were 2.3 times more likely to persist (OR= 2.31; 90% CI: 2.36-2.36). Conversely, a negative association was found between introductory courses that taught test taking skills and student persistence (see Table 4.7). When pre-programs provided test taking skills in an introductory course, 76% of the students did not persist (OR =.24; 90% CI .01-.47).

Table 4-7 Associations between pre-program support and persistence

Associations between Pre-program Support and Persistence	
AFINS Survey Items	OR (90% CI)
Does your institution offer specialized development or introductory courses that teach: test taking skills?	.24 (.01 -.47)
Does your institution offer specialized development or introductory courses that teach: study skills?	2.54 (2.46 - 2.63)
Does your institution offer specialized development or introductory courses that teach: critical thinking skills?	1.26 (1.11 - 1.41)
Does your institution offer specialized development or introductory courses that teach: math skills?	2.9 (2.79 - 3.01)
Does your institution have academic advisors?	2.31 (2.26 - 2.36)

Program support. Program support was defined as assistance or enrichment provided to students from peers, faculty, including mentoring and tutoring, and courses designed to address academic or study deficiencies during a nursing program or when students are enrolled in nursing school. As shown in Table 4.8, six items in the AFINS survey were related to program support. One items queried about simulation in nursing school, one item was related to designated faculty whose workload was restricted to student success, and four items were related to aspects of a specialized nursing course offered to student. All programs reported simulation use in nursing school.

Table 4-8 Descriptive Data: Program Support

Program Support	
AFINS Survey Items	N (percentage of agreement)
Is simulation incorporated into your nursing program?	39 (100)
Does your nursing program offer a specialized nursing course that teaches test taking skills to your pre-licensure nursing students?	39 (43.6)
Does your nursing program offer a specialized nursing course that teaches time management skills to your pre-licensure nursing students?	39 (38.5)
Does your nursing program offer a specialized nursing course that teaches study skills to your pre-licensure nursing students?	39 (33.3)
Does your nursing program provide test prep sessions to your nursing students?	39 (74.4)
Do you have a designated nursing faculty whose workload is solely nursing student persistence (student success)	39(30.8)

Lastly, positive associations were not found between five of the six items related to nursing program support and nursing student persistence. At the program level, a majority of the programs did provide academic support to their students; however, only one item was associated with nursing student persistence. When programs employed a designated faculty member whose workload was dedicated to student persistence, their students who were 1.3 times more likely to persist and graduate on time (OR= 1.3; 90% CI 1.17- 1.47). Almost three-fourths of programs provided test prep sessions for their students; however, when the program provided these sessions, persistence rates did not meet the benchmark of 85%. (See Table 4.9). This study suggests that test prep sessions are an ineffective strategy to increase the persistence rate among pre-licensure

students. Test prep sessions, provided during nursing school, were not associated with student persistence; 23% (OR=.77; 90% CI .64-.90) of the students did not persist and graduate when these sessions were provided.

Table 4-9 Associations between Program Support and Student Persistence

Associations between Program Support and Student Persistence	
AFINS Survey Items	OR (90% CI)
Is simulation incorporated into your nursing program?	- -
Does your nursing program offer a specialized nursing course that teaches test taking skills to your pre-licensure nursing students?	1.07 (.92 -1.22)
Does your nursing program offer a specialized nursing course that teaches time management skills to your pre-licensure nursing students?	1.02 (.88-1.16)
Does your nursing program offer a specialized nursing course that teaches study skills to your pre-licensure nursing students?	.96 (.82 -1.10)
Does your nursing program provide test prep sessions to your nursing students?	.77 (.64 -.90)
Do you have a designated nursing faculty whose workload is solely nursing student persistence (student success)?	1.3 (1.17 - 1.43)

Conclusion

A tool was created using the Delphi technique with input from five content experts. The objective of the Delphi technique was to identify academic support determinants that contribute to student persistence. Based on these results, the 14-item AFINS survey was created. This survey was distributed to deans and directors of 93 Texas pre-licensure nursing programs. Four associations between academic support at the pre-program level and student persistence were found. When pre-programs offered introductory courses that taught math skills, study skills, and critical thinking skill and employed academic advisors, student persistence rates were 85% or higher. Deans and

directors all reported simulation use in their programs. A majority of the programs surveyed did not provide academic support at the program level, with the exception of test prep sessions. When the nursing program provided students with faculty whose workload was student persistence/student success, the persistence rates were 85% or higher.

Chapter 5

Discussion

To meet the state's projected need for nurses in 2020,approximately 25,000 nursing students will need to graduate that year; in 2013, slightly more than 11, 000 candidates took NCLEX after successfully completing their nursing program (Texas Board of Nursing, 2014). Many factors impact nursing student persistence, but little is known about the contribution of academic factors. To identify the essential components of persistence, content experts were queried through two rounds of questions using the Delphi technique. The Academic Factors Influencing Nursing Student persistence (AFINS) survey, a 14-item survey, was constructed based on this feedback. Associations between academic support and nursing student persistence were found. In this chapter, interpretations of the findings, which will include limitations, conclusions, implications for nursing research and education, and recommendations for future studies will be discussed.

The research questions are:

1. What is the association between institutional support and pre-licensure nursing student persistence as self-reported by Texas nursing program deans and directors?

2. What is the association between pre-nursing program support and pre-licensure nursing student persistence as self-reported by Texas nursing program deans and directors?

3. What is the association between nursing program support and pre-licensure nursing student persistence as self-reported by Texas nursing program deans and directors?

Interpretations of the Delphi Technique

Items included in the AFINS survey were informed from a survey of experts. Two rounds of questioning were conducted using the Delphi technique.

Institutional Support

Institutional support was defined as the students' right to use physical or material resources, such as library resources and computer labs. After two rounds of surveying using the Delphi technique, 10 institutional support items were potential contributors but only three were deemed essential: 1) accessibility of library resources,2) information technology (IT) personnel available to assist students, and 3) faculty who are student friendly.

Accessibility of library resources. Tinto (1993, 2012) has long studied and consistently reported the importance of institutional support on student persistence. Accessibility of library resources was scored essential to student persistence, but the number of books & online resources was scored as useful but not essential to student persistence. The accessibility of library resources (Jeffreys, 2012; Tinto, 2012) has been cited as a contributor to student persistence.

Informational technology. Technology use was scored as useful, except for the IT personnel to assist students. Research studies that focused on the relationship between IT support and student persistence were not found; however, Edyburn (2011) reported an increase in technology use in the classroom as a method to actively engage students.

Actively engaged students are more likely to persist in higher education (Esposto & Weaver, 2011). Many students are using computer and other technological devices increasing the need and importance of IT support (Saddiki, Harroud, & Karmouch, 2012). In this study, as well as in an earlier study (THECB, 2006), a majority of nursing students was less than 30-years-old. Since younger students are more likely to use electronic resources (Haddow & Joseph, 2010) providing support staff to assist students suggests students' needs are being met. Computer labs and resources may not be essential to persistence as more than 97% American adults, age 18-29, owned a cell phone in 2014 and 78% of American adults owned a computer in 2012 (Pew Research Internet Project, 2014).

Student-friendly faculty. "Student-friendly" is a subjective term that was not defined by the experts. Gardner (2005)reported that faculty who are approachable and "treat the student like an individual with wants, desires and needs" (p.159) are more likely to be successful. Positive feedback from faculty is believed to encourage and support students in nursing school which promotes persistence (Williams, 2010). Faculty who are approachable (Cason et al., 2008; HARRISON, 2009)~~;~~ Harrison, 2009) have been cited as contributors to student persistence.

Pre-program Support.

Pre-program support was defined as assistance or enrichment provided to students from peers, faculty, including mentoring and tutoring, and courses designed to address academic or study deficiencies at the university level and not specific to the nursing program or nursing school. In the second of two rounds of questioning in the Delphi study related to pre-program support, 17 questions were potential contributors to

nursing student persistence. Five of these items were scored essential and included on the AFINS survey: 1) Specialized development or introductory courses that taught test taking skills, 2) study skills, 3) critical thinking skills, 4) specialized math labs, and 5) academic advisors.

Introductory course: Test taking skills.. Specialized development or introductory courses are designed to help students' transition into higher education. They have been used for more than a decade and have helped students when taken during the first semester of college (Cho & Karp, 2013). Introductory courses have multiple foci and include time management, study skills and test taking. Academic performance on a test is related to several factors including the time spent studying, academic ability and study habits (Nonis & Hudson, 2010). Many students enter higher education unprepared (Balduf, 2009). Colleges and universities need to provide the necessary skills to promote persistence.

Introductory courses: Study skills. Study skills include effective note taking, reading skills, listening skills, and the ability to remember information (Silvestri, 2010) When students develop and use study skills that can be successful (Straker & Kelman, 2007); however when students enroll in a study skills course and are resistant to change, the study skills course is ineffective (Yuksel, 2006). Students need to learn and to practice the study skills to reap the benefit of this skill acquisition.

Introductory courses: Critical thinking skills. Critical thinking was considered essential to student persistence. (Chan (2013) suggested early teaching of critical thinking so that students would develop and use analytical thinking to improve patient outcomes. Critical thinking has not been studied in relation to academic support.

Introductory courses: Math skills. Increased student persistence was reported when time management and math skills were taught (Allen & Lester, 2012); conversely, (Swart et al., 2010) did not find a relationship between time management and academic achievement. Effective math skills require logic and critical thinking ability.

Academic advisors. Academic advisors were instrumental in supporting pre-nursing students as they transitioned into higher education and with nursing students assisting them to persist and graduate (Harrison, 2009) Effective academic advisors have “knowledge of university studies, the nursing curriculum, the admission criteria and process” (Harrison,2009b, p. 231).

Program Support.

Program support was defined as assistance or enrichment provided to students from peers, faculty, including mentoring and tutoring, and courses designed to address academic or study deficiencies during a nursing program or when students are enrolled in nursing school. In the second round of questioning in the Delphi study, 13 items were potential contributors to nursing student persistence at the program level. Five items were deemed essential: 1) simulation, 2) specialized nursing courses that teach test taking skills, 3) time management skills, 4) study skills, and 5) designated nursing faculty whose workload is student success/student persistence.

Simulation. Simulation, which uses interactive and hands on activities, has been used to promote patient safety in nursing and medical education (Gaba, 2004). Few studies have examined the contribution of simulation on persistence (Glidewell & Conley, 2014) reported higher test scores when nursing students worked with high fidelity simulators to learn renal and cardiac content.

Specialized nursing courses: Test taking skills. Nursing program tests differ from pre-program tests, as many of the questions on nursing tests are created to evaluate critical thinking (Straker & Kelman, 2007). Billings (2007)suggests seven steps to prepare for nursing school tests. Begin with a study plan, attend class and participate in test review sessions are among the steps. When nursing faculty taught, test taking skills, math skills and time management skills to at-risk students, who were admitted to the nursing program but prior to taking a clinical course, these students were more likely to persist and graduate (Symes et al., 2002).

Specialized nursing courses: Time management skills. Straker and Kelman (2007) reported the importance of good time management and its impact on persistence and success in nursing school. When students use a calendar and planning time to study daily, they have increased knowledge retention, which improves their overall performance. Students who lack time management skills tend to struggle or not persist in nursing school (Jeffreys, 2012).

Specialized nursing courses: Study skills. Study skills and time management are interrelated. A good study plan begins with a calendar (Silvestri, 2010). First semester nursing students often lack basic study skills, test taking skills, and time management skills (Straker and Kelman, 2007). When nursing student were provided workshops or classes that taught writing skills, study skills, critical thinking, and test taking skills, they were more likely to persist and graduate (Igbo et al., 2011).

Test prep sessions Billings (2007) suggested test review sessions as a method to improve test success. Studies to support test prep sessions were not found. Silvestri (2010) provides strategies for test success that includes practice questions, rationales

and test taking tips as a method to improve test scores in nursing school and to prepare for National Council Licensure Examination for Registered Nurses (NCLEX-RN).

Designated nursing faculty. Positive student outcomes have been reported when nursing faculty take on the role of Student Success (SS) and provide guidance and skills to assist with persistence (Symes et. al, 2002). Among the skills that were taught include time management, study skill, testing taking and critical thinking. Persistence rates have been above the state benchmark of 85% since instituting the SS program at (University of Texas at Arlington College of Nursing, 2013).

Adjunct support, such as mentors, tutors, supplemental instructors, and faculty member support, has been reported inconsistently as important to student persistence (Gardner, 2005; Gordon & Copes, 2010; Potolsky et al., 2003; Robinson & Niemer, 2010), similarly, consensus among the content experts was mixed. After two rounds of surveying, adjunct support personnel were considered useful but not essential to nursing student persistence.

Interpretations of the AFINS survey

Before discussing the findings from the study, the response rate will be reported and potential factors that may have impacted the response rate will be discussed. An email explaining the study and the survey link were emailed to the 93 deans and directors three times: December 21, 2013, January 6, 2013, and January 16, 2014. Follow-up emails or reminder emails have increased the survey response rates (Cook, Dickinson, & Eccles, 2009).

Response Rate. Thirty-nine deans and directors participated in the AFINS survey, which was a 41.9% response rate. The response completion rate refers to

respondents who completed all questions (Albaum, Wiley, Roster, & Smith, 2011). Thirty one respondents completed the survey, which is a 33% overall completion rate. Electronic response rates range from 12.9% (McMinn, Bearse, Heyne, Smithberger, & Erb, 2011) to 48% (Kittleson & Brown, 2005). The initial and two subsequent follow-up emails were sent to the eligible deans and directors (see Appendix D). Participation was requested and the importance of input from all deans and directors was cited. Making a personal appeal may have increased the response rate (McKenna, 1994). No monetary compensation was offered for participation; however, a summary of the study results will be emailed to the 93 deans and directors by June 2014.

What is the association between institutional support and pre-licensure nursing student persistence in Texas nursing programs?

All program deans and directors reported their programs provided students with the institutional resources deemed essential to persistence; therefore, an association between institutional support and pre-licensure nursing student persistence could not be determined. .The importance of institutional support has been reported for many years (Jeffreys, 2012; Tinto 1993, 2012). The Academic Support: Model of Nursing Student Persistence shows a probable relationship between institutional support and persistence, but the direction cannot be established based on this study; however, Tinto (2012) supports the necessity of institutional support and its positive impact on student persistence. Computer use and technology were cited as strategies to increase student retention (Edwards & O'Connor, 2011).

What is the association between pre-nursing program support and pre-licensure nursing student persistence in Texas nursing programs?

This study found four positive associations and one inverse association between pre-program support items and nursing student persistence. When introductory courses included math skills, study skills, and critical thinking skills, students were more likely to persist and graduate. Programs that employed academic advisors were associated with higher persistence rates Academic Support: The Model of Nursing Student Persistence shows a questionable association between pre-program support and student persistence.

Early academic support, as a method to increase student persistence, has been reported for more than 15 years (Campbell & Dickson, 1996). When programs offered an introductory math courses, students were almost three times more likely (OR= 2.9; 90% CI: 2.8-3 0) to persist and graduate. Allen and Lester (2012) cited the higher retention rates after student completed a course that included math skills.

Introductory courses that taught test taking skills were negatively associated with persistence. More than 75% of programs that offered test taking skills as an introductory course had persistence rates less than 85% which is contrary to previous studies (Allen & Lester). Many nursing tests have analysis and application questions which are more difficult to answer and require critical thinking. Typically, these types of questions are not commonly used in pre-nursing tests (Straker & Kelman, 2007). The lack of higher level thinking questions, such as analysis and application questions, on tests prior to nursing school may account for the negative association between student persistence and pre-program courses that teach test taking skills.

Researchers (Cho & Karp, 2013; Pomalaza-Raez & Groff, 2003; Swart et al., 2010) have found positive outcomes or higher persistence rates after designing and implementing introductory courses that teach college survival skills, such as time

management and study skills. However, an association between time management and student persistence was not found in this study. Although students may take a course in time management skills, it does not ensure that students use the skills. Students may have other commitments such as work or family issues that impede their ability to manage their time well. Additionally, many nursing students underestimate the amount of reading and studying required in nursing school and the mandatory hours they must in the clinical setting

When programs utilized academic advisors, students were more than twice as likely to persist and graduate. A majority of program leaders (38 of 39) reported that academic advisors supported their students. Academic advisors can have a positive impact on students' lives (Harrison, 2009a), encourage lifelong learning (White & Schulenberg, 2012), and give support and guidance (Bond et al, 2008).

What is the association between nursing program support and pre-licensure nursing student persistence in Texas nursing programs?

At the program level, one item was positively associated with a persistence rate of 85% or higher, and one items had an inverse association with a persistence rate of less than or equal to 85%. Academic Support: Model of Nursing Student Persistence shows both positive and negative associations between program support and student persistence, based on the results of this study.

When programs employed nursing faculty whose workload was student persistence/student success, these programs were 1.3 times more likely to have students who persisted; however, less than a third of the program deans and directors reported employing this designated faculty. In 2006, the THECB recommended that Texas

nursing programs incorporate student retention counselors as a method to increase student persistence. This study supports that initiative, as programs that have designated nursing faculty were more likely to have students who persisted in the program.

.When the nursing programs offered test prep sessions to their students, the students were 76% less likely to persist. While exam review sessions have been found to help students be successful on exams, students need to attend the sessions, be engaged in the learning (Kaupins, 2005), and have a good understanding of the material to reap the benefit of the sessions (Lee, 2006). Information related to the frequency of the sessions, student attendance at the sessions, accessibility of the session, or content presented was not part of this study. More research is needed to understand why these sessions were ineffective and are not associated with student persistence

Fewer than half of the program leaders reported a nursing course that taught test taking skills, time management, or study skills; although, almost 75% (29 of 39 programs) provided test prep sessions for their students. When programs provided test prep sessions, 23% of these programs had low persistence rates (OR: .77; 90% CI .64-.90). In contrast, when nursing programs established courses for at risk students, which included study skills, critical thinking (Igbo et al, 2011) and time management (Symes et al., 2002), persistence rates increased.

All deans and directors reported simulation use in their programs. Simulation, believed to be essential to nursing student persistence by content experts, has not been studied as a component of academic support. Researchers have studied student satisfaction with simulation (Zulkosky, 2012); patient safety (Anderson & Leflore, 2008);

knowledge acquisition with simulation, (Harris, Pittiglio, Newton, & and Moore, 2014) and replacing clinical experiences with simulation (National Council of State Board of Nursing, 2014). All programs provided simulation; therefore, an association cannot be made based on the results of this study

Limitations

Limitations were associated with this study. The target population was Texas nursing programs, which limits the generalizability to Texas. The responses were self-reported secondary data of dean and directors. To increase the response rate, the survey link was sent to programs deans and directors three times. Identifying participant information was not collected; however, Qualtrics does provide IP addresses for each participant. Three addresses were identical and a majority of the responses were similar, although not all. Two program deans/directors were responsible for two separate programs, and their program email addresses were identical. If the program leader provided data related to each program, this could have accounted for duplicate Internet Protocol (IP) addresses. Betts (2010) reported that IP addresses may be changed daily or monthly. All responses, whether the survey was completed or not, were included in the computations; therefore, it is possible that a participant could have completed the survey twice.

The timing of the survey may have been problematic as most nursing programs have extended breaks at the end of the fall semester. Respondents failed to answer all the survey questions. The demographic data were complete and the persistence rate question was answered by 80% of the respondents. The placement of the persistence question following the demographic data questions may have been problematic.

Completing the demographic data section required looking up that information, as data was collected several years ago. One program leader stated that information was not available; another program leader stated IRB approval was needed prior to completing the survey. Two emails were sent to that IRB director without a response.

This study focused on availability of resources, but did not focus on accessibility or frequency of use. The definition for persistence was not used consistently throughout the survey. ADN programs that consisted of four semesters should graduate within six semesters of enrolling were considered on time graduation. This definition was included in the initial email to deans and directors and restated in the initial consent; however, an incorrect definition of graduating within 18 months of admission was used for the survey question related to student persistence.

Additionally, the possibility exists that selection bias occurred as study participants were not randomly selected (Šimundic, 2013) and sampling bias as participants cannot be identified and may not represent all nursing program in Texas (Hulley et al., 2007).

Finally, when the survey was first launched, the text boxes were not working. Written responses were not allowed. Two respondents reported the problem which was corrected within 24 hour of the launch. This malfunction could have contributed to random error (Waltz, Strickland, & Lenz, 2005) and potentially reduced reliability of the study.

Conclusions

An association between institutional support and student persistence could not be addressed. All deans and directors reported providing this type of support to their students.

Four items of academic support at the pre-program level were associated with nursing student persistence, and one item at the program level was associated with nursing student persistence. With the projected need for nurses, nursing programs need to admit and graduate more students. Knowing the academic factors that are associated with persistence and implementing these support items will potentially increase the number of registered nurses. Further research studies are needed to support these findings.

Implications for Nursing Research and Education

In this study, pre-program introductory courses that taught study skills and math skills, and academic advisors at the pre-program level contributed to higher persistence rates. When these academics supports were provided pre-program or prior to nursing school, students tended to persist and graduate. This study suggests early intervention at the pre-program level is associated with student persistence. Additionally, when programs employed nursing faculty in a position that focused on student persistence, students were more likely to persist and graduate. Completing a cost analysis related the benefits of designated faculty to student persistence may help address the feasibility for this type of academic support. Nursing programs that have high attrition rates may consider these academic supports to increase their persistence rates.

Recommendations for Future Studies

This study explored dean and director reporting of essential components of academic support, but was limited to programs in Texas. Expanding the research to other states would further nursing knowledge and could provide potential elements that contribute to nursing student persistence beyond Texas. This study was limited to faculty perceptions. Future research studies that focus on nursing student perceptions may find the same or differing components that are essential to nursing student persistence. The needs of students may differ based on the level of nursing education. Additionally, researchers have not focused on the impact of the timing of academic support; a longitudinal study may determine whether student needs' change as they progress through the nursing school. Comparisons of students who used the resources with students who did not use resources may increase understanding of the essential resources students need to persist and graduate. Finally, intervention studies could identify the most effective use of resources and determine whether frequency of accessing the resources impacted progression through nursing school.

Summary

With the projected nursing shortage, identifying factors that promote persistence are essential to increasing the number of nursing school graduates. An association between academic factors that contribute to persistence and graduation was found. Ongoing research is needed to verify these results.

Appendix A

Delphi Technique: Comments from content experts

Institutional Support:

IT personnel available to assist with applications that students use

Faculty that are student faculty; recognition for teaching in T&P process; top-down message supports student learning

Student advising; structural major departments (math, science, English), university email and technology (Blackboard)

Pre-program Support:

Specialized introductory programs that teach:

Self care

Critical thinking, development of intrinsic motivation and positive attitude toward lifelong learning

Financial management

Other academic support that is essential to student persistence

Counseling Services to deal with stress management issues

Financial

Program Support:

Specialized nursing course(s) that teach:

Self-care

Professionalism

Other academic factors that contribute to student persistence

Study courses, run by faculty, not for credit…just to guide students as they study for other courses

Motivation, level of preparation in math and writing in high school

Appendix B

Delphi Technique: Results Round One

Type of Support	Component Item	Percentage of Agreement	
		Essential	Useful
Institutional Support			
Technology	Computer labs	80 %	20%
	Computer training		100%
	Computer resources	80 %	20%
Library resources	Number of books and resources available	20 %	80%
	Availability of online resources	80%	20%
	Accessibility of library resources	80%	20%
Pre-program Support			
Specialized development or introductory courses that teach:	Test Taking Skills	60%	40%
	Time Management Skills	60%	40%
	Study skills	100%	
	Library skills	40%	60%
Specialized Labs	Math	60%	40%
	Reading	20%	80%
	Writing	80%	20%
	Students whose first language is not English	80%	20%
Tutoring	Tutoring program	60%	40%
	Peer tutoring		100%
	Faculty	40%	60%
	Supplemental instructors	40%	60%
	Teaching assistants	20%	80%
Mentoring	Program		100%
	Peer mentors		100%
	Faculty mentors	40%	60%
Academic advisors	Academic advisors	100%	
Program Support			
Technology support	Library resources	60%	40%
	Computer labs	60%	40%
	Computer resources	80%	20%
	Simulation	80%	20%
Specialized nursing courses that teach:	Test Taking Skills	60%	40%
	Time Management Skills	60%	40%
	Study skills	60%	40%
Tutoring	Peer tutors		100%.
	Faculty tutors	40%	60%
	Supplemental instructors	20%	80%
	Test prep sessions	80%	20%
Mentoring	Peer mentors		100%
	Faculty mentors	60%	40%
Designated nursing faculty	Workload is student success/student persistence	Essential 80% Missing data	

Appendix C:

Delphi Technique: Results from Round Two

Type of Support	Item	Percentage of Agreement	
		Essential	Useful
Institutional Support			
Technology	Computer labs	60%	40%
	Computer training		100%
	Computer resources	60%	40%
	Learning Management System (New)	60%	40%
	IT personnel available to assist with applications that students use (*New)*	80%	20%
Library resources	Number of books and resources available	80%	20%
	Availability of online resources	60%	40%
	Accessibility of library resources	80%	20%
Personnel* support	*Faculty who are student friendly*	100%	
Pre-program Support			
Specialized development or introductory courses that teach:	Test Taking Skills	80%	20%
	Time Management Skills	60%	40%
	Study skills	80%	20%
	Library skills	40%	60%
	Self-care	60%	40%
	Finance & budget	20%	80%
	Critical Thinking	100%	
Specialized Labs	Math	80%	20%
	Reading	20%	80%
	Writing	40%	60%
	Students whose first language is not English	80%	20%
Tutoring	Tutoring program	60%	40%
	Peer tutoring		100%
	Faculty	40%	60%
	Supplemental instructors	20%	80%
	Teaching assistants		100%
	Peer tutoring		100%
	Faculty	40%	60%
Mentoring	Program		100%
	Peer mentors		100%
	Faculty mentors	60%	40%
Academic advisors	Academic advisors	100%	
Counseling Services	*To deal with stress management issues*	60%	40%
Program Support			
Technology support	Library resources	60%	40%

	Computer labs	60%	40%
	Simulation	100%	
Specialized nursing course that teaches:	Test Taking Skills	80%	20%
	Time Management Skills	80%	20%
	Study skills	80%	20%
Tutoring	Peer tutors		100%
	Faculty tutors	40%	60%
	Supplemental instructors	20%	80%
	Test prep sessions	80%	20%
Mentoring	Peer mentors		100%
	Faculty mentors	60%	40%
Designated nursing faculty	Workload is student success/student persistence	100%	

Appendix D

Emails to Deans and Directors:

Initial email: December 21st
Hello,
My name is Ceil Flores. I am a doctoral student in the nursing program at the University of Texas in Arlington, College of Nursing. My dissertation work is to determine the impact of academic support on pre-licensure nursing student persistence. You were chosen based on your position as dean or director as you are in a decisive role to assist students.

The demand for registered nurses in Texas is projected to increase exponentially. The essential academic resources students require to persist are not known.

The Academic Factors Impacting Nursing Student persistence survey, a 14 item questionnaire, was created to identify the essential academic resources that nursing students need to persist and graduate. The survey should take less than 10 minutes to complete. Demographic data pertaining to your program are also being collected. If you are a one year LVN to ADN program, report data from spring 2011- fall 2012; if a two year program, report data from fall 2010- summer 2013. No identifying information specific to your students or program is requested. Results of this study will be disseminated to you through your faculty email within the next six months, after the data are analyzed.

Having information from all pre-licensure nursing programs will give the best understanding of the resources that are needed; therefore, the study will not be complete without your valuable input.
If you would like to participate, please click the link below to be directed to the consent form and survey.
https://utanursing.co1.qualtrics.com/SE/?SID=SV_5jbz60OqE4XdAQR

Second email: January 6th
This is a reminder email, requesting your participation in my dissertation study. If you have already completed the survey in late December, thank you very much.

Hello,
My name is Ceil Flores. I am a doctoral student in the nursing program at the University of Texas in Arlington, College of Nursing. My dissertation work is to determine the impact of academic support on pre-licensure nursing student persistence. You were chosen based on your position as dean or director as you are in a decisive role to assist students.

The demand for registered nurses in Texas is projected to increase exponentially. The essential academic resources students require to persist are not known.

The Academic Factors Impacting Nursing Student persistence survey, a 14 item questionnaire, was created to identify the essential academic resources that nursing students need to persist and graduate. The survey should take less than 10 minutes to complete. Demographic data pertaining to your program are also being collected. If you are a one year LVN to ADN program, report data from spring 2011- fall 2012; if a two year program, report data from fall 2010- summer 2013. No identifying information specific to your students or program is requested. Results of this study will be

disseminated to you through your faculty email within the next six months, after the data are analyzed.

Having information from all pre-licensure nursing programs will give the best understanding of the resources that are needed; therefore, the study will not be complete without your valuable input.
If you would like to participate, please click the link below to be directed to the consent form and survey.
https://utanursing.co1.qualtrics.com/SE/?SID=SV_5jbz60OqE4XdAQR
Thank you very much.

Final email: January 17th

This is a follow-up email. If you have not had the opportunity to participate in my research, please complete the survey before next Tuesday, January 21st at 2200. If you have completed the survey, thank you so much; please do not re-take the survey.
Hello,
My name is Ceil Flores. I am a doctoral student in the nursing program at the University of Texas in Arlington, College of Nursing. My dissertation work is to determine the impact of academic support on pre-licensure nursing student persistence. You were chosen based on your position as dean or director as you are in a decisive role to assist students.

The demand for registered nurses in Texas is projected to increase exponentially. The essential academic resources students require to persist are not known.

The Academic Factors Impacting Nursing Student persistence survey, a 14 item questionnaire, was created to identify the essential academic resources that nursing students need to persist and graduate. The survey should take less than 10 minutes to complete. Demographic data pertaining to your program are also being collected. If you are a one year LVN to ADN program, report data from spring 2011- fall 2012; if a two year program (ADN or BSN), report data from fall 2010- summer 2013. No identifying information specific to your students or program is requested. Results of this study will be disseminated to you through your faculty email within the next six months, after the data are analyzed.

Having information from all pre-licensure nursing programs will give the best understanding of the resources that are needed; therefore, the study will not be complete without your valuable input.
If you would like to participate, please click the link below to be directed to the consent form and survey.
https://utanursing.co1.qualtrics.com/SE/?SID=SV_5jbz60OqE4XdAQR
Thank you very much.

Appendix E

AFINS Survey

Academic **F**actors **I**mpacting **N**ursing **S**tudent persistence Survey

Academic support is a construct and is defined as assistance and resources provided to college students that include three domains of support: institutional support, pre-program support and program support. Within the survey, support definitions will be provided for each domain.

Persistence/graduation rates are determined by the length of time it takes students to complete a nursing program. When completing this survey, please use these time frames based on your program level:

- If your program is an LVN to ADN program (12 month program), the time frame is Spring 2011-Fall 2012
- If your program is a two year ADN, BSN, MSN entry level, or Diploma program, the time frame is Fall 2010-Summer 2013.

Institutional support is being defined as the students' right to use physical or material resources, such as library resources and computer labs.

1. Does your institution have library resources that are accessibility to your students? Yes_____ No____
2. Does your institution have IT personnel to assist with applications that students need? Yes ___No ___
3. At an institutional level, are you faculty considered student friendly? Yes_____ NO_____

Pre-program support is defined as assistance or enrichment provided to students from peers, faculty, including mentoring and tutoring, and courses designed to address academic or study deficiencies at the university level and **not** specific to the nursing program or nursing school.

1. Does your institution offer specialized development or introductory course(s) that teach test taking skills? Yes _____ No _____
2. Does your institution offer specialized development or introductory course(s) that teach study skills? Yes _____ No _____
3. Does your institution offer specialized development or introductory course(s) that teach critical thinking skills? Yes _____ No _____
4. Does your institution offer specialized development or introductory course(s) that teach math skills? Yes _____ No _____
5. Does your institution have academic advisors? Yes _____ No_____

Program support is academic support provided to students who are admitted to a nursing program that contribute to their persistence

1. Is simulation incorporated into your nursing program? Yes _____ No _____
2. Does your nursing program offer a specialized nursing course that teaches test taking skills to your pre-licensure nursing students? Yes _____ No _____
3. Does your nursing program offer a specialized nursing course that teaches time management skills to your pre-licensure nursing students? Yes _____ No _____
4. Does your nursing program offer a specialized nursing course that teaches study skills to your pre-licensure nursing students? Yes _____ No _____
5. Does your nursing program provide test prep sessions to your pre-licensure nursing students? Yes _____ No _____
6. Do you have a designated nursing faculty whose workload is solely nursing student persistence (student success)? Yes _____ No _____

Demographic Data from your nursing program for the students beginning in the academic year 2011.

1. How many students do you admit each year to your program?

2. Type of program: _____ADN _____BSN _____Diploma

3. What is the age range of your students? Mean age? _____

4. Please report the percentage of nursing students in your program of the following

- Male _____ Female_____
- Ethnicity: ____Black/African American _____American Indian/Alaska Native _____ Hispanic _____ Native Asian/Pacific Islander _____White _____ Native Hawaiian/ Pacific Islander _____Asian _____International _____Multiracial _____Unknown/Not reported

5. What is the numerical grade that students must have to pass a nursing course?

6. Do you have a minimum grade point average as admission criteria? If yes,
   - Cumulative _____Science GPA _____

7. Are students required to take a standardized entrance exam?
If yes, which test do they take? _____
Are students required to make a certain score to be admitted? _____

Persistence rate is defined as completing an associate degree nursing program within 18 months after being admitted to nursing school or completing a baccalaureate program within 36 months (Texas Board of Nursing, 2010).

In December 2012 (one year programs) or August 2013 (two year programs), was your graduation rate: less than 85% _____yes _____no

85% or higher _____yes ____ no

Appendix F

Institutional Review Board Approval for Study

UT Arlington
Informed Consent Document

PRINCIPAL INVESTIGATOR
Cecilia "Ceil" Flores, Candidate for PhD, College of Nursing

FACULTY ADVISOR
Judy LeFlore, Nursing, jleflore@uta.edu

TITLE OF PROJECT
Academic Factors that Contribute to Pre-licensure Nursing Student Persistence.

INTRODUCTION
You are being asked to participate in a research study about contributors of pre-licensure nursing student persistence. I am looking specifically at resources that are provided at the institution, pre-program, and program levels. Your participation is voluntary. Refusal to participate or discontinuing your participation at any time will involve no penalty or loss of benefits to which you are otherwise entitled. Please ask questions if there is anything you do not understand.

PURPOSE
The specific purpose of this research is as follows: To determine whether academic support at the institution level, pre-program level, and program level contributes to pre-licensure nursing student persistence.

DURATION
Participation in this study will last approximately 10 minutes.

NUMBER OF PARTICIPANTS
The number of anticipated participants in this research study is 105.

PROCEDURES
You will complete the online survey which contains questions related to academic support. Aggregate data from your program will be analyzed. You will not be asked to identify your program, but will be asked to identify the level of education (associate degree, bachelor degree, diploma program, and master entry level program).

POSSIBLE BENEFITS
You may learn which academic resources contribute to student persistence.

POSSIBLE RISKS/DISCOMFORTS
There are no perceived risks or discomforts for participating in this research study. Should you experience any discomfort please inform the researcher, you have the right to quit any study procedures at any time at no consequence.

IRB Approval Date: DEC 19 2013

IRB Expiration Date:

UT Arlington
Informed Consent Document

COMPENSATION
No compensation will be offered for participation in this study.

ALTERNATIVE PROCEDURES
There are no alternative procedures offered for this study. However, you can elect not to participate in the study or quit at any time at no consequence.

VOLUNTARY PARTICIPATION
Participation in this research study is voluntary. You have the right to decline participation in any or all study procedures or quit at any time at no consequence.

CONFIDENTIALITY
Every attempt will be made to see that the study results are kept confidential. Data stored on password-protected computers that have been encrypted; data stored on a flash drive will be password-protected. Data collected through Qualtrics, the research software, will be protected through secure measures the company takes, which include data encryption, high-end firewall-protected servers, and routinely performed vulnerability scans. The results of this study may be published and/or presented at meetings without naming you as a participant. Additional research studies could evolve from the information you have provided, but your information will not be linked to you in anyway; it will be anonymous. Although your rights and privacy will be maintained, the Secretary of the Department of Health and Human Services, the UTA Institutional Review Board (IRB), and personnel particular to this research have access to the study records. Your records will be kept completely confidential according to current legal requirements. They will not be revealed unless required by law, or as noted above. The IRB at UTA has reviewed and approved this study and the information within this consent form. If in the unlikely event it becomes necessary for the Institutional Review Board to review your research records, the University of Texas at Arlington will protect the confidentiality of those records to the extent permitted by law.

CONTACT FOR QUESTIONS
Questions about this research study may be directed to Cecilia Flores @ cflores@uta.edu or Dr. Judy LeFlore at @ jleflore@uta.edu Any questions you may have about your rights as a research participant or a research-related injury may be directed to the Office of Research Administration; Regulatory Services at 817-272-2105 or regulatoryservices@uta.edu.

IRB Approval Date: DEC 19 2013

IRB Expiration Date:

UT Arlington
Informed Consent Document

CONSENT

By clicking on the "accept" button, you are agreeing to participate in the study and are confirming that you are 18 years of age or older and have read or had this document read to you. You have been informed about this study's purpose, procedures, possible benefits and risks, and you have received a copy of this form. You have been given the opportunity to ask questions before you sign, and you have been told that you can ask other questions at any time. If you choose not to "accept", your internet browser will close.

You voluntarily agree to participate in this study. By click on the accept button, you are not waiving any of your legal rights. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue participation at any time without penalty or loss of benefits, to which you are otherwise entitled.

IRB Approval Date: DEC 19 2013

IRB Expiration Date:

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Biographical Information

Cecilia "Ceil" Flores completed her undergraduate education in May 1979 at Texas Woman's University. She worked for more than 25 years in the post anesthesia care unit, becoming certified as a Certified Post Anesthesia Nurse (CPAN) and Certified Ambulatory Perianesthesia nurse (CAPA). She enjoyed being a preceptor and orienting new nurses. Her desire to impact nursing through nursing education led her to pursue a masters of science in nursing. She graduated from the University of Texas at Arlington (UTA) in May 2007 and earned a post-master's certification in nursing education in 2008.

She entered the PhD program in fall 2008 while working full time at UTA. Since May 2010, Ceil has been the Student Success Coordinator for the College of Nursing. She works with in-seat and off-campus students. Her primary focus is first semester nursing students. She received the Graduate Dean Fellowship and the Bond Fellowship. Ceil is a member of the Sigma Theta Tau, an international nursing honor society, and will be inducted into the Honor Society of Phi Kappa Phi this April. While a doctoral student, she has presented at state, national and international nursing conferences on nursing student issues. After graduation she plans to continue working at UTA College of Nursing. She is passionate about student success and plans to conduct collaborative research on how to increase the persistence rates of undergraduate nursing students. She was a nominated for Teaching Excellence Award, D Magazine Nurse Educator award, and Cross Award. She received the William S. Ward Endowment Award in 2012.

Ceil has been married to Sam Flores for 34 years. They have two daughters, Carrie Flores and Katy (Cody) Pierce, and one grandson, Gabriel Pierce.