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Persistence of Community College Transfer Students in a Private Liberal Arts University Nursing Program

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PERSISTENCE OF COMMUNITY COLLEGE TRANSFER STUDENTS
IN A PRIVATE LIBERAL ARTS UNIVERSITY NURSING PROGRAM

by

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ABSTRACT

PERSISTENCE OF COMMUNITY COLLEGE TRANSFER STUDENTS IN A LIBERAL ARTS UNIVERSITY NURSING PROGRAM

Rita M. Amerio
Old Dominion University, 2010
Chair of Advisory Committee: Dr. Mitchell R. Williams

The United States is bracing for the largest shortage of registered nurses that the United States health care system has ever experienced. As the population of “baby boomers,” those born between 1946 and 1960, turns 65 beginning in 2011, the nation will be faced with providing health care services to the largest group of elderly Americans in history. Unlike previous generations, this group has had the advantage of advanced medical care that will allow them to live well into their 80s and even 90s.

The purpose of this study was to conduct a preliminary investigation to identify predictor variables that are related to persistence of students in a baccalaureate nursing program at a mid-sized, private, Midwestern, Catholic, liberal arts university. The populations in this retrospective study are comprised of native students who began their college experience as freshmen nursing majors at a mid-sized, private, Midwestern, Catholic, liberal arts university, and community college transfer students who transferred into the university as sophomores or juniors, between the years of 2001 and 2007. Many colleges of nursing in the United States have experienced high rates of student attrition, mostly in the first year. Students who leave these programs were selected through rigorous screening processes over other qualified candidates who were not able to enroll due to the limitations of classroom and lab space, a shortage of nursing faculty, and

This dissertation is dedicated to my husband Gene. Without his continuous support and encouragement this body of research would never have been completed. It is also dedicated to my children and their spouses who suffered through all my “dissertation talk” over the past year and a half. And finally my grandchildren who I hope will always remember that if you really want something and are willing to work for it...it will be yours no matter what others say. As well as always remembering it is all about “The Climb”.

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To my friend and mentor, Dr. Peggy Rice who encouraged me almost every day. To my fellow directors Dr. Nan Yancey and Linda Elsik who helped take up the slack when my thinking was a little cloudy due to what I called “dissertation brain”. To all my co-workers who tolerated the many moods of a dissertation writer.

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CHAPTER I: INTRODUCTION

For the past 100 years the American health care system has depended on registered nurses to provide safe and timely care to the patients they serve. The American Association of Colleges of Nursing (AACN, 2009) projected that there will be a shortage of 500,000 registered nurses in the United States by the year 2025. The human cost of increased nurse-to-patient ratio in the hospital caused by such a shortage, could be as high as 23 lives per 1,000 patients (United States Department of Health and Human Services, 2007). The elderly population will increase dramatically as the “baby boomer” generation move into their 60s and beyond. In addition, technological changes have prolonged the lives of those who would have succumbed to chronic illnesses 50 years ago. Not only are people living longer, but they are living with the problems of chronic disease that demand an increased need for long-term nursing care (Buerhaus, Staiger, & Auerbach, 2009a). As these three trends, a shortage of registered nurses, an increasing elderly population, and increased technology prolonging life expectancy converge; a serious healthcare crisis could become a reality.

As the demand for a good or service increases, the supply of that commodity will increase until that demand decreases. A nursing shortage increases the demand or need for registered nurses. Hospitals respond by increasing salaries and bonuses attracting students to the profession. This response leads to an increase in college of nursing applications and an eventual decrease in registered nurse vacancies. There is documented history that populations have weathered nursing shortages in the past, usually without dire consequences (Buerhaus et al., 2009a). The expected shortage today, however, is based on very different circumstances compared to past deficiencies in the supply of

nurses. This healthcare system, for the first time in history, will need to provide services for the largest group of elderly patients demanding and needing services in history of the United States. This same healthcare market will need to meet this demand with the smallest number of health care providers in recorded history. The market will be sorely tested.

The depressed United States economy of 2008 and 2009 has also affected the nursing shortage. Economic upswings or recessions affect the amount of money available to the consumer to purchase goods or services. Hadley and Waidmann (2006) found that consistent health care insurance coverage in the five years preceding retirement at the age of 65, results in a healthier population gifted with increased longevity. The effect of an increasing unemployment rate on this pre-65 years of age group includes loss of health insurance at a very crucial period of time. Decreases in available health care dollars will result in a decrease in the older adult's use of preventative services, as well as the availability of early treatment of symptoms preceding a serious illness. Research has documented that Medicare recipients faced with a decreasing income will forgo filling prescriptions or seeking health care because of the inability to pay deductibles and drugs not covered by Medicare (Lemieux, Chovan, & Heath, 2008; Pedian, Lu, & Varasteh, 2009; Schmittiel et al. 2009). This lack of preventative services and early treatment will result in increasing numbers of critically ill patients requiring admission to hospitals (Ayanian, Weissman, Schneider, Ginsburg & Zaslavsky, 2000).

On the supply side of this equation, with a depressed economy, hospitals have seen a decrease in the number of nursing vacancies in hospitals, as these positions are filled by nurses returning to the nursing workforce, or moving from part-time to full time

employment, due to financial strains. When the economy improves, this temporary solution to the shortage will vanish as nurses who returned to the workforce due to economic distress choose to no longer work (Buerhaus, et al., 2009; Carlson, 2009). The nursing shortage will continue to grow as the elderly population increases, and those demanding care will overwhelm the inadequate supply of registered nurses.

Background of the Study

The imbalance in health care resources facing the United States today is the result of a shrinking pool of registered nurses and an increasing community of patients needing health care. The most obvious solution seems to be to increase the supply of nurses. However, for the year 2005, a National League for Nursing (NLN) survey found that 147,000 nursing candidates were denied admission nationwide due to inadequate space in nursing programs. These candidates included 33,279 baccalaureate applicants, 110,576 associate degree applicants, and 3,614 diploma program candidates (NLN, 2005). Nursing school capacity issues include the lack of qualified faculty, lack of class space, shortage of clinical sites in which student nurses practice, and high attrition rates in nursing programs (AACN, 2006; Buerhaus, et al., 2009; Jeffreys, 2004; Kuehen, 2007; Norman, Buerhaus, Donelan, McCloskey, & Dittus, 2005).

Many of the present nursing faculty will be retiring during the next 5 to 10 years (Buerhaus, et al., 2009; Kuehen, 2007). Presently, the number of students enrolled in graduate education programs preparing to replace those retirees, is inadequate to meet future educational needs (Valiga, 2004). The American Association of Colleges of Nursing (AACN) published a "*Special Survey on Vacant Faculty Positions*" (2007) citing 814 faculty vacancies at 449 baccalaureate nursing or graduate nursing programs

across the United States. These numbers translate into a 7.6% faculty vacancy rate or approximately 1.8 faculty vacancies per program. Reasons for the reported nursing faculty shortage include: noncompetitive salaries, lack of doctoral prepared faculty, and inability to find faculty members who are willing and qualified to teach clinical courses (AACN, 2007). Approaching retirements of present faculty, and lower numbers of qualified candidates applying for graduate preparation to teach in nursing colleges, will lead to an increasing number of nursing student candidates being denied admission.

Schools of nursing also are turning away candidates due to lack of classroom space (NLN, 2005). The mid 1990s saw the proliferation of managed care organizations and their affect on healthcare. The trend to move patient care from in-hospital to outpatient care decreased the number of clinical practice sites at which student nurses learn to care for patients (Kuehn, 2007). This trend also led to inaccurate forecasts that the need for registered nurses would decrease. The years 1995 to 2000 saw shrinking enrollment in baccalaureate nursing programs, which led to decreased allocation of funds for expansion of facilities, such as classrooms and lab space (Buerhaus, et al., 2009). Colleges today are acutely feeling this space crunch as they are being advised to increase the number of students admitted to meet the current nursing shortage (AACN, 2007: Buerhaus, et al., 2009, Kuehn, 2007)

Schools are also having difficulty procuring clinical practice sites from affiliate hospitals (Kuehen, 2007). Due to shorter hospital stays inpatient census is decreased and there are fewer clinical experiences available to students. Patricia Foley (personal communication, April 8, 2008), Education Coordinator at Edward Hospital in Naperville, Illinois, confirmed that patterns of student placement in their facility have changed from

mostly weekday positions, to using sites in the evenings and on weekends. It appears that hospitals have reached their capacity for educating increasing numbers of students (Halse & Hage, 2006; Kessler, 2003).

Thirty to 40% student attrition rates are not uncommon in many nursing programs (Campbell & Dickson, 1996; Newton, 2008; Peter, 2005; Rotenberg & Bergman, 1997). The Central Maine Medical Center College of Nursing and Health Professions reported attrition rates of 38%, 32%, and 41% for the years 2005, 2006, and 2007 respectively (Central Maine Medical Center CONHP, 2008). Newton (2008) stated that while nursing applications have increased 59% in the past 10 years, nursing school student attrition rates have been reported as high as 55%. The University of Texas Health Science Center at Houston, as reported by Work (2008) in the *Wichita Falls Times Record News*, revealed that for nursing students starting in 2001, the average graduation rates hovered around 67%. Faced with these educational challenges what can be done to increase the number of registered nurses to face the impending nursing shortage?

With many prospective students being turned away due to lack of nursing program openings, it becomes more important than ever to fill those seats with students who have the greatest chance of being retained to graduation (Norman et al., 2005). The National Center for Education Statistics (NCES) reports in 2008 that 1,045 community colleges in the United States enrolled approximately 6.2 million students or 35% of all college students. Many prospective nursing students start at the community college level, and then choose to complete their education at a four-year university. Research studies indicate that those who start at a community college with the goal of transferring, and obtaining a baccalaureate degree, are less successful in reaching that goal when compared

to native university students (Cohen & Brawer, 2003). Students interested in nursing as a career, do enter community college in the hopes of obtaining an associate degree in nursing that will allow them to become a registered nurse (NLN, 2005). Vervena and Fulcher (2005) found that 82% of two-year colleges offering associate degrees reported that the number of applicants was double the capacity available. These applicants have completed most of the prerequisites for the nursing program with no admission date in sight.

Barr and Schuetz (2008) agree that on admission to the community college many students are neither psychologically nor academically prepared for the work of college. Almeida (1991) found that while some community college professors may feel that underprepared students do not belong in the college environment, along with Barr and Schuetz (2008), Almeida feels that these are the students that populate the community college and it would be best for the faculty to learn how best to reach these students. When comparing native students to community college transfer students, Carlan and Byxbe (2000) found that American College Testing (ACT) scores for both groups revealed lower scores (mean = 18.76) for the community college student compared to those native students (mean = 21.56). However, in the lower division courses, prior to transfer, the community college transfer students' grade point averages (GPA) were comparable to the native students' GPA. The results of their study attributed the decrease in GPA experienced by transfer students in their first semester to "transfer shock." Research indicates that many transfer students experience a drop in GPA their first semester in a four-year university (Hills, 1965). Even with this first semester decline for the community college transfer students, the overall cumulative average of the upper

division courses revealed no difference for community college transfer students when compared to natives (Carlan & Byxbe, 2000).

The institution involved in this study, administers a standardized preadmission test to all nursing majors. This preadmission test is the Nurse Entrance Test (NET), which among other outcomes measures the students' math and reading ability. During the six years covered by this proposed study, 2001 to 2007, if a student failed either the math and/or reading portion of the test, they were required to enroll in a remedial math and/or reading course. In 2007, the university in this study decided to remove the option to remediate for community college students wishing to transfer who failed the math and/or reading portion of the NET to remediate. This change in policy meant that community college students who did not pass the math and/or reading portions of the NET were no longer eligible to transfer to the nursing program at the university, thus reducing the number of students eligible to enroll. Native students who did not pass the math and/or reading portions of the NET were able to take a remediation course in math and/or reading.

Purpose Statement

The United States is facing a nursing shortage in times of increased need for care by these health care workers. There is evidence that as the lack of registered nurses increases the chances for errors in patient care also increase (United States Department of Health and Human Services, 2007). Further compounding this issue is the inability of nursing education to provide program placements for qualified students interested in pursuing nursing as a career. Every semester more than 33,000 students, who have met the criteria to enter a baccalaureate program in nursing are turned away (NLN, 2005).

Decreasing numbers of faculty, limited numbers of nursing education classrooms and clinical practice sites combined with 50% attrition rates in many nursing programs, are all problems facing nursing education today. One solution may be to decrease the number of enrolled nursing students who fail to successfully complete the nursing program. This could be accomplished by identifying those variables that indicate a greater propensity for success in a program of nursing. Colleges and universities budget staff and facilities (classrooms and clinical sites) for the number of students initially admitted. Losing up to 50% of the admitted students' means faculty, classrooms, and clinical sites may not be used efficiently. Buerhaus (2009a) calls upon the Institute of Medicine's new Committee on the Future of Nursing to advocate research studying why the supply of needed nurses is "bottlenecked" at the point of nursing education. Simply put, what can be done to increase graduation rates of nursing students? That discovery will contribute needed research related to increasing the supply of registered nurses, and that investigation is the purpose of the study.

There are many studies which examine postsecondary student retention and success in college programs involving community college transfer students. The research is also rich with studies of variables affecting nursing student retention. The gap in the literature occurs in studies related to community college students who transfer into a nursing major at a mid-sized, private, Catholic, liberal arts university. Brenemen (1990) identifies the private, liberal arts institution as one that permits smaller classes, fostering a sense of community for not only students, but for faculty as well. This sense of community, faculty support and small class size has been shown to benefit students needing more individualized attention by successfully remediating such students' deficits

(Finn, 1999). Perhaps the structure of the four year private liberal arts university can increase success for community college transfer students as cited in a study by Morphey, Twombly and Wolf-Wendel (2001). This study will address the gap in the literature that occurs in studies related to community college students who transfer into a nursing major at a mid-sized, private, Catholic liberal arts university.

The purpose of this study was to conduct a preliminary investigation to identify predictor variables that are related to persistence of students in a baccalaureate nursing program at a mid-sized, private, Midwestern, Catholic, liberal arts university. This study compared success rates, as determined by retention to graduation, of community college transfer students to native students in a baccalaureate program at a mid-sized, private, Midwestern, Catholic, liberal arts university. In addition to examining retention to graduation rates between the two groups, any association between math and reading scores, as measured on a standardized test, as predictor variables possible impacting success of the groups was studied. The expectation is that factors indicating future success in a nursing program may be identified and strengthen nursing major admission requirements used to choose the most viable nursing student candidates. The research questions which guided this study are:

Research Questions

1. Is there a statistically significant difference at alpha level .05, in the percentage of native students compared to community college transfer students who are retained to graduation and students from each group who are not retained in the

nursing program at a private, Catholic, liberal arts university admitted into nursing courses from fall 2001 to spring 2007?

2. Is there a statistically significant difference at alpha level .05, in the math scores, as reported on the Nursing Entrance Test (NET), for students admitted to nursing courses from fall 2004 to spring 2007, of native students compared to community college transfer students who are retained to graduation and students from each group who are not retained in the nursing program at a private, Catholic, liberal arts university?
3. Is there a statistically significant difference at alpha level .05, in the reading scores, as reported on the Nursing Entrance Test (NET), for students admitted to nursing courses from fall 2001 to spring 2007, of native students compared to community college transfer students who are retained to graduation and students from each group who are not retained in the nursing program at a private, Catholic, liberal arts university?

Professional Significance

Registered nurses serve as the fulcrum for the healthcare system. The reality of a significant shortage of practitioners to fulfill this role is on the horizon. Actions need to be taken now by nursing educators, community college leaders, as well as university leaders to prevent a lowering of health care standards in the United States and eliminate future increases in patient mortality of those hospitalized. For nurse educators the ultimate purpose of this study is to increase the number of qualified candidates who enter nursing and are successful in their quest to obtain a nursing license. One way to accomplish this goal is to promote the retention of nursing candidates admitted into a

baccalaureate nursing program by identifying variables that if addressed may increase the success of both native and community college transfer students.

Research has shown that each year large numbers of students enter the community college system with the hope of obtaining a nursing degree through the community college portal. This choice can be based on a number of factors: lack of financial support to access four-year universities, need for remedial education to bolster success in chosen career path, convenient location for commuter student, or the wide availability of courses suited to the working adult's schedule. The community college offers access to education for the communities they serve. The community college, with its open access policy, is not unlike the mission of many Catholic, private, liberal arts universities that offer a supportive environment to students who may need remedial assistance. The population from which the subjects of this study were drawn is from a mid-sized, private, Midwestern, Catholic, liberal arts university. The institution offers a freshmen remedial program to students who have difficulty meeting the academic admission requirements of the university. The university also boasts small class sizes, generally less than 30 students, which foster individualized learning. In this same spirit, the nursing program also offers remediation to nursing students as they are completing their nursing courses.

Many renowned public and private universities attract candidates into their nursing programs in large numbers. These institutions can be selective in their admission of the brightest and best candidates. This still leaves a large pool of candidates, who with some assistance are able to graduate and begin practice as a safe, qualified registered nurse. The population of this study is students who start their journey at the community college level and then transfer into a nursing program alongside native students in a

private liberal arts university. Studying certain factors used as a basis for admission into a baccalaureate nursing program, may help identify those factors that lead to success in a nursing program.

The American Association of State Colleges and Universities in an October 2005 policy paper suggested that community colleges and universities partner to help alleviate the nursing shortage (American Association of State Colleges and Universities, 2005). The hope is that one of the results of this study will enable such partnerships to be more successful in aiding this transfer process and result in a higher number of nursing graduates per year. The benefit would be an increase in the ranks of registered nurses to meet the future demands of an older population in the United States.

Overview of the Methodology

This study will examine retention rates, defined as persons who graduate from the chosen nursing program within six semesters of starting nursing courses. It was a quantitative, causal-comparative study. The data employed will be selected using a census sample collected from students who entered the five-semester course of study in the nursing program between fall 2001 and spring 2007. This study included only looking at community college transfer students admitted to the university from fall 2001 to spring 2007 and did not include transfer students from four year colleges or other proprietary institutions who were admitted in the same time frame. The program admits a new cohort of students every fall and spring. The initial number of students admitted during this time was 380. One hundred and three of these students were native students. One hundred and seventy-seven were community college transfer students. Only community college transfer students were the focus of this study. The institution studied is a mid-sized (6,000

students) private, Midwestern, Catholic, liberal arts university. The participants of the first group were students who began as freshmen at the university studied and who transfer in less than six hours of credits (none of which can be sciences) and remain at the college of nursing until they graduate. This group is identified as native students. The participants of the second group are students who transfer into a baccalaureate nursing program from a community college with greater than six credits of study at the community college level. This group is identified as community college transfer students. The demographic data collected included age, student status (native or transfer), cumulative GPA upon admission into nursing courses, and cumulative GPA at the end of the first semester of these nursing courses. Other data collected for this study included results of NET scores in reading and math, and number of semesters from start of nursing courses to graduation.

Data was collected from the Office of Admissions at the university after human subjects' approval was received. Anonymity of the students was maintained by using assigned case numbers, and by reporting only in the aggregate. The entire population of native and community college transfer students was studied as defined above, so there will not be a sampling measure employed. The population studied was included as defined above, so there will not be a sampling measure employed. Data was collected and entered into Statistical Package for the Social Sciences (SPSS) data collection software for analysis. Statistical analysis for differences in mean graduation rate for each group of students, research question one, was a chi-square test. The chi-square analysis is a nonparametric test of significance comparing expected frequencies with observed frequencies (Levin & Fox, 2006). Research questions two and three were analyzed by the

t-test for independent samples. The t-test is a statistical procedure for testing whether there is a statistically significant difference between means of two groups (Levin & Fox, 2006).

Delimitations

This section of the proposal describes limitations of the research design (Creswell, 2003). The research design used was a quantitative, causal-comparative study. In this type of research design, ex post facto, or previously collected data was used. This differs from an experimental study in that the researcher has lost the ability to manipulate the variables. This loss of control will allow relationships to be identified but prevents the researcher's ability to determine cause and effect.

One delimitation will be that this study was based on data collected from students attending a mid-sized, private, Midwestern, Catholic, liberal arts university. This choice was made for two reasons. While the university is more selective in admission, many community college transfer students can meet these requirements, and similar to a community college, this type of university also provides remedial classes to prepare students for college level work. Finally, the scope of this study was limited as it only encompassed a few possible variables that may be responsible for student attrition,

Definition of Terms

Associate Degree Nursing Program—One of three educational pathways which upon successful completion permits graduates to sit for nursing boards. Length of study is two years or four semesters. These programs at presently produce most of the registered nurses licensed today (United States Department of Labor, 2008-2009).

Baby Boomer Generation—Generation of people born in the post World War II baby boom years, 1946 to 1964 (Buerhaus, et al., 2009).

Baccalaureate Nursing Program—One of three educational pathways which upon successful completion permits graduates to sit for nursing boards. Length of study is four years or eight semesters. At this time, they are the second most used pathway to becoming a registered nurse (United States Department of Labor, 2008-2009).

Clinical practice sites—Student nurses practice their skills in a healthcare setting, usually a hospital, under the supervision of nursing faculty from the college they attend (Jeffreys, 2004).

Community college transfer students—Students who transfer into a baccalaureate nursing program from a community college with greater than six credits of study at the community college level. In this study the term transfer student will refer to community college transfer student unless otherwise noted.

Diploma Nursing Program---One of three educational pathways, which upon successful completion, permits graduates to sit for nursing boards. Length of study is three years. These programs are being phased out in favor of programs located at degree granting institutions (United States Department of Labor, 2008-2009).

Managed care organizations—Health care provider or groups of providers who contract to provide health care services at a discounted rate. Profit is realized for the providers, if care can be provided for less than the reimbursement received (Buerhaus, et al., 2009).

National Council Licensure Examination for Registered Nurses (NCLEX-RN)—examination that is required for licensing of graduates from a state approved nursing

program. The examination measures the basic competencies required to practice as a registered nurse.

Persisters—Students who graduate from the university’s nursing program in six semesters or less.

Nonpersisters—Students who do not graduate from the university’s nursing program in six semesters or less.

Mean GPA at time of transfer—The final GPA as recorded on the student’s final community college transcript.

Native students— Students who begin as freshmen at the university and who transfer in less than six hours of credits (none of which can be sciences) and who remain at the college of nursing until they graduate.

Nurse Entrance Test (NET)—Pre-entrance nursing test developed by Educational Resource, Incorporated. This test provides information about the students’ abilities in “reading (specifically ability to read science books), math skills, stress level, learning styles and social interaction profile” (Abdur-Rahaman, Femea, & Gaines, 1994).

Nursing courses—Curriculum nursing courses that can only be taken by admitted students to the program and generally have a clinical practicum component. Successful completion of all courses in each semester is required for the student to move into the next semester.

Private, Catholic, liberal arts university—University operated by a religious group with a mission of providing a well-rounded, liberal arts education for students.

Retention rate—Number of students who graduate from the chosen nursing program within six semesters of starting nursing courses.

Student attrition—Loss of a student due to academic failure and/or personal reasons within six semesters of starting nursing courses (Jeffreys, 2004).

CHAPTER II: LITERATURE REVIEW

Method of Literature Review

The literature review is an analysis of the research on any given topic. For this study that topic stemmed from a curiosity about the high attrition rates of students after they entered a nursing program. This was a special concern as the United States is facing its worst nursing shortage in its history. That nursing shortage and high nursing education attrition rates led to this study. Electronic retrieval was used to search the Cumulative Index to Nursing & Allied Health Literature (CINAHL©) along with Medical Literature Analysis and Retrieval System Online (MEDLINE ©). Searches were led by the keyword “nursing shortage.” Other databases used to search phrases such as “nursing student retention” and “nursing education.” Databases such as “Proquest Nursing Journals” and “Nursing & Health Sciences: A Sage Full-Text Collection” provided a rich source of information. Educational Databases such as “EBSCO Host,” “ERIC,” and “Wilson Web,” also provided a generous supply of literature based on search terms such as higher education, student retention, college retention theories, transfer shock, community college transfer students, and liberal arts colleges. The reference list following all of these sources also provided additional sources of literature to review.

The United States is facing an unprecedented increase in its population of older adults over the age of 65. Due to medical advances people are living longer but are often suffering from chronic illnesses demanding medical care (Buerhaus, et al., 2009). At the same time this country is facing a shortage of registered nurses to provide care for this population. This deficit could be as high 500,000 registered nurses by 2025 (AACN,

2009). Compounding the problem is the fact that in the present nursing workforce, 33% of registered nurses are age 50 or older, while the number of younger nurses decreases as students are drawn to more lucrative careers (Buerhaus, et al., 2009a). As members of the nursing workforce retire, there will be a shortage of younger nurses to replace the retirees. The question is what can be done to fill those vacancies? One answer is to increase the number of nursing students graduating each year.

What is known is that nursing programs today are turning away significant numbers of would-be nursing students due to lack of space. Also known is the fact that some nursing programs experience attrition rates of as much as 50%. This provides for an inefficient use of available space in these programs and ultimately lower numbers of graduates eligible for licensure (AACN, 2006; Buerhaus, et al., 2009a; Jeffreys, 2004; Kuehen, 2007). The following review surveys empirical studies that have examined the problem of student attrition in higher education, nursing programs, as well as student characteristics and academic factors that may be involved in determining retention.

This chapter begins by documenting the reality of a looming shortage of registered nurses in the United States. A review of retention theories of college students spanning the past 70 or more years follows, ending with an examination of theories regarding nursing student attrition in higher education. Following is a closer look at abilities in reading and math and their connection, if any, to student attrition both for the general college student population, and more specifically for nursing students.

University campuses today, and more specifically nursing programs, are populated by a mix of traditional students who have followed a linear path from high school to college, as well as traditional and nontraditional students who have attended

community colleges and then transferred into the four year university as a sophomore or junior. While studies are plentiful regarding community college students who transfer to four year institutions, research literature looking at these same students transferring into baccalaureate nursing programs is virtually nonexistent.

This chapter will lay the foundation for the purpose of this study which is to identify predictor variables that are related to persistence of students in a registered nursing program at a mid-sized, private, Midwestern, Catholic, liberal arts university. Finally, a closer look will be taken at persistence to graduation for community college transfer students when compared to native students in a private liberal arts university.

Nursing Shortage

The term “nursing shortage” is not new. The United States has successfully dealt with and weathered the waxing and waning of its registered nurse workforce in the past. In a shortage situation, supply and demand issues usually bring relief in a surge of graduating nursing students answering the demand for new registered nurses (Buerhaus, 2008). This expected shortage, which has been brewing for the past 20 years, will be different than those in the past. Using even the most conservative projection numbers for the registered nurse shortage, 285,000 by 2020, this number is triple the size of any documented nursing shortage in the past 60 years (Buerhaus, 2009a).

For the generations born before the 1950s, especially for women who predominate the nursing workforce, career choices were limited to being a nurse, teacher or secretary (Buerhaus, et al., 2009; Slatterly, 2004). For women born after 1970, gender barriers fell away and women were lured to more lucrative careers. By the early 1990s many of the women interested in healthcare, chose to be physicians rather than nurses

(Slatterly, 2004). According to the Association of American Medical Colleges (AAMC) in the span of 25 years from 1980 to 2005, the number of female graduating physicians almost doubled from 3,898 to 7,394 (American Medical Association, 2009). The expansion of career opportunities for women in part has contributed to today's aging workforce of registered nurses with few younger replacements in the pipeline (Slatterly, 2004). A 2005 survey reported by the Health Resources and Service Administration (HRSA) of nurses revealed an average age of 45, while the percentage of nurses under 30 was a mere 8% of the workforce (HRSA, 2005). It is obvious that as retirement age looms for the greatest segment of the workforce, there will not be enough nurses to fill their positions (Palumbo, McIntosh, Rambur, & Naud, 2009)

The ailing economy of 2008 and 2009 has presented a new challenge to combating this large impending shortage of nurses. In the past, nursing shortages themselves have attracted students to the nursing professions. The shortages have spurred hospitals to offer attractive salaries and bonuses to meet their increased need for registered nurses. These benefits attracted many new students into nursing. A slowed economy doesn't permit such incentives. The current recession which began in December 2007 by January 2009 has outlasted any recession since World War II. Between December 2007 and the end of 2008, 2.5 million jobs were eliminated (Evans & Maher, 2009). The nursing workforce has seen a surge in nurse employment as many nurses have been forced back into the employment market, by a spouse's loss of job or other financial downturns. Many nurses who had planned to retire have put off their plans until the economy is more stable (Buerhaus, 2009b). For many areas of the country it appears the nursing shortage is over, but is this true? Buerhaus, Auerbach and

Staiger (2009) predict that this lessening of the shortage is only temporary and when the economy improves, nursing vacancies will increase and the nursing shortage will reappear just as the “baby boomer” population begins to retire.

M. Moore (personal communication, August 6, 2009), Coordinator of Retention at a Midwest university, related that the present graduating seniors are encountering difficulties securing a new position, creating a false sense that the nursing shortage is over when in reality these nursing positions have been filled by registered nurses forced back to work due to economic conditions. If this trend continues, future nursing students might not view nursing as being a recession-proof career (Buchan, 2008). The result will be fewer nursing applicants leading to an even greater shortage as the population of older adults’ increases and the present nursing workforce retires. This present recession may ease the present nursing shortage but in fact complicates filling the future needs of those seeking health care.

A bipartisan effort to overhaul the present United States health care system was undertaken in 2010. The goal was to extend affordable health care to all Americans in need of insurance. It is uncertain how these healthcare changes will affect the nursing shortage. At first glance, it would seem that the more people who can afford insurance, the greater need for a strong registered nurse workforce (The White House, 2010). With new health care legislation to cover this nation’s estimated 32 to 46 million uninsured citizens, there will be greater need for health care providers especially in primary care (The White House, 2010). It has been suggested that nurses with advanced degrees at the master’s degree and doctorate level will fill this gap of primary care providers in the United States (Johnson, 2010). This will create an even greater nursing shortage.

These predictions of registered nurse shortages are not considered to be accurate by everyone. Goldfarb, Goldfarb, and Long (2008) have found that predictions of labor shortages may be wrong. One example they use is that in the early 20th century it was estimated that there would be a shortage of telephone operators in 50 years. This thinking was based on early 20th century needs that didn't allow for technological advances that would make the role of telephone operators almost obsolete. Even these authors caution that technology advances may not replace the nurse of the future. The Agency for Healthcare Research and Quality (AHRQ) report *Making Health Care Safer: A Critical Analysis of Patient Safety Practices* concluded that an increased percentage of registered nurses "...was associated with decreasing falls, length of stay, postoperative complications, nonsocomial infections, pressure ulcer rate, urinary tract infection, and postoperative infections" (Seago, 2001, para 30). Aiken, Clarke, Sloan, Sochalski, and Silber (2002) found that just adding two extra patients to a nurse's workload increased the chances of patient mortality by 14%. In 2008, the Centers for Medicare & Medicaid services decided to no longer reimburse hospitals for events that may prolong hospitalization and increase the cost of care for an admitted patient. These so-called "never" events included; pressure ulcers, falls and trauma, hospital caused infections (nonsocomial) and urinary tract infections (Department of Health and Human Services, 2008). Hospitals will be depending on skilled registered nurses in adequate numbers to prevent loss of reimbursement.

So what can be done to satisfy the future health care needs of an aging population? Universities and colleges need to graduate increasing numbers of students using limited educational space, a nursing faculty shortage, as well as diminished clinical

capacity in which to practice. One solution is to decrease high attrition rates to make full use of the resources available presently for educating new nurses. This study begins to investigate this solution by examining retention theories in higher education.

Retention Theories in Higher Education

There is a significant amount of professional literature consisting of empirical studies related to the retention of students in higher education. This research is very timely today as colleges and universities are being asked to demonstrate accountability for outcomes, such as retention, to accrediting agencies, government officials and the public (Metz, 2005).

Theories of student retention of traditional students in postsecondary education began with the work of W. Spady, although his initial work was overshadowed by Vincent Tinto who drew from Spady's work and became the most renowned, most quoted voice on student retention in higher education (Berger & Lyon, 2005). Tinto's interactional theory focused on the interaction of the student and his college environment. Those who followed in Tinto's footsteps, such as Astin, saw student involvement in the college culture to be the key to retention. With the entrance in the mid-1980s of the nontraditional student to the college campus, theories based on this interaction would be tested (Berger & Lyon, 2005).

During the past century, the retention rate of postsecondary students has hovered around 50% (Bean, 1980; Seidman, 2005). Even with the results of multiple studies and theories little improvement has been seen in these retention rates. What we do know is that retention in higher education is a complex problem that has more than one solution.

What follows is a review of the literature on persistence theories based on economic, psychological, and sociological perspectives in higher education.

The basic tenet of any economic theory of persistence is based on the student's belief that the benefit of a college education outweighs the amount of debt they are willing to incur (Braxton & Hirschy, 2005; St. John, Cabrera, Nora, & Asker, 2000). The student needs to believe that the time, effort, and cost he or she puts forth will result in a desired benefit for them in the future. Finances can present a formidable barrier to student success (St. John, et al., 2000). Lack of financial worries positively affects retention by making academic and social integration more likely. The benefit of part-time employment is believed to be less worrying about finances, making time spent in class and study more productive. Working on-campus also leads to greater integration and greater commitment which increased the chances of retention (Astin, 1975; Schuh, 2000). Economic factors' effect on persistence are based on the students' belief that at graduation the money sacrificed by tuition and lost wages during their educational journey will be more than made up in the career they have chosen (Caberra, Stampen, & Hansen, 1990).

Bean, Eaton, and Astin were the first researchers to study psychological factors and their effects on retention. Bean and Eaton (2000), like many other researchers developed their model of college student retention in an attempt to explain the psychological implications of Tinto's theory. Their basic premise was that "leaving college" was a behavior; and all behavior has psychological roots. Attitude is based on the belief that something is beneficial or non-beneficial to the individual. These attitudes lead to intentions that govern behavior (Bean & Eaton, 2000).

Entering any unfamiliar situation requires the individual to adapt or fit in to the new environment. This adaptation process as seen by Bean and Eaton (2000) requires the student to use coping techniques to conform to the environment and prevent or decrease stress that results from unsuccessful adaptation. These choices are generally behaviors that have worked well for the individual in the past. These techniques can either help or hinder this adaptation process. Eaton and Bean (1993) developed the approach/avoidance model of adaptation. Approach strategies improved chances of successful adaptation, while avoidance behaviors inhibited success. This adaptation closely resembles Tinto's integration model (Bean and Eaton, 2000).

Additional theories involved in Bean and Eaton's (2000) model are motivational in nature. Self-efficacy is the belief that one possesses the ability to succeed in a chosen task. This belief is often based on past experiences. Other studies have found that self-efficacy was the most useful predictor of retention as well as academic success in the underprepared student (DeWitz, Woolsey, and Walsh, 2009; Lent, Brown, and Larkin, 1987). Jeffreys (2004) in her development of a model of nursing student retention, however cautions that possession of too much self-efficacy can actively hinder success of the student by over confidence in their abilities leading to a lax use of study skills.

Forsyth and McMillian (1981) tested a previously developed model of attribution by Weiner, Russell, and Lerman (1979) testing locus of control. Locus of control implies that the individual attributes the source of personal outcomes to either an internal (self) or external (environmental) cause. Students with an internal locus of control, who were academically successful, felt that they had total control of performance and their resulting behavior produced the desired outcome. Students with an external locus of control

attributed their success or nonsuccess to luck or some other environmental element out of their control. Students with an internal locus of control were more likely to be academically successful and less likely to drop out. Bean and Eaton (2000) conclude that all of the above psychological processes have a basis in the background characteristics the student brings with him or herself. The student then interacts with the environment in the chosen institution of study. This interaction will determine behaviors displayed by the individual that may or may not lead to persistence.

Initial studies of retention were often based on sociological models. Sociological theories are based on characteristics possessed by the student that affect retention in postsecondary education. These characteristics are forces that have helped the student to create the world as that individual interprets his or her environment. These characteristics include family and cultural values, socioeconomic status, and the ability to interact in a social environment (Seidman, 2005). One of the most prominent theorists on retention, Tinto, favored sociological issues as the basis for retention in higher education (Tinto, 1975). More recently, in 2000, theories based on this perspective have been advanced by Berger, Kuh, and Love (Seidman, 2005).

Tinto's early work in the 1970s was based on previous higher education persistence research done by Spady who based the catalyst for decisions of departure on Durkheim's theory of suicide. Durkheim posited that the inability of an individual to enmesh themselves into society, the higher the chance of making the decision to leave (Tinto, 1975). Tinto believed that characteristics formed by a student's social exposure to society, prior to the college experience, interacted with the characteristics of the college or university. This interaction influenced the decision to stay or depart from the

institution. These characteristics included family background, individual attributes, and precollege education. Family background included: socioeconomic status (SES), level of education achieved by the parents, and standards that the parents expect the student to attain. Individual attributes that the student brings include academic ability, race, and gender. Precollege schooling included the quality of secondary education and how well the student achieved academic success (Tinto, 1975). Tinto agreed with previous research that found that a balance needed to be present between social and academic integration. Too much time spent in socialization could easily lead to lower grades placing the student in academic jeopardy. Too much focus on academic integration could lead to poor socialization, which may lead to voluntary withdrawal (Tinto, 1975). Tinto slightly revised his theories in 1987 and 1993, by including economic factors, environmental factors and psychological issues in his basic theory, however, there is no doubt that his beliefs have been the most quoted in development of new theories as researchers sought to agree or disagree with his basic theory (Tinto, 1993).

Modern Theories of Student Persistence in Higher Education

Prior to 1985 retention theories were based on the traditional student who followed a linear pattern from high school to college. Most likely this student would reside on campus and undertake studies leading to the award of the baccalaureate degree. Bean and Metzner's (1985) student retention research began to focus on a unique type of student who began to populate college campuses in the early 1980's. The nontraditional student was older, did not reside on-campus, and most importantly, had responsibilities other than that of a student. Nontraditional students also dropped out at a higher rate.

Bean and Metzner (1985) prefaced their study by creating a definition of the nontraditional student:

A nontraditional student is older than 24, or does not live in a campus residence (e.g., is a commuter), or is a part-time student, or some combination of these three factors; is not greatly influenced by the social environment of the institution; and is chiefly concerned with the institution's academic offerings (especially courses, certification, and degrees).(p. 489)

Bean and Metzner's seminal work in 1985 produced a conceptual model of nontraditional student attrition that contained many of the same elements identified by previous researchers. The difference is the amount of importance these elements hold for the two types of students. Nontraditional students who live-in the community are much more affected by the day-to-day situations they face in that community. Environmental variables, such as finances, employment, family responsibilities, and outside support are more prominent in the nontraditional student than for the traditional student whose primary residence is on-campus. If the institution is going to increase retention of this type of student it would be necessary to create support services that would meet the needs of these nontraditional students. Braxton and Hirschy (2005) further examined Bean and Metzner's theory regarding the nontraditional student and identified specific actions to increase retention rates for nontraditional students. These recommendations included: assessment of students prior to matriculation, use of active learning techniques more amenable to the adult student, creation of learning communities based on block

scheduling to create “communities” of these learners, and for administrators to be more attentive to the learning needs of the commuter student (Braxton & Hirschy, 2005).

Today’s college environment is a conglomerate of traditional and non-traditional students. Tinto (2006) challenges higher education administrators and faculty to “move from theory to action” (p. 6). Knowing why students attrite without action to address these challenges to student success may explain why the attrition rate has hovered around 50% for the past 40 years (Tinto, 2006). Following is a model of retention that not only explains why students attrite but what can be done to increase the likelihood of success for students in nursing programs.

Model of Persistence in Nursing Education

Common among the theories just identified was that they all were designed to examine retention of the undergraduate student non-specific to major. Recognizing this obvious gap in the research, the Nursing Undergraduate Retention and Success (NURS) model was developed by Jeffreys in 1993. This model is the most well-known organizing framework related to retention in nursing education (Jeffreys, 2004). It was created for the purpose of early identification of at-risk students, application of strategies to enhance retention based on student deficiencies and needs, and evaluation of student outcomes. This model will serve as the foundation for this study.

In the 1990s, when Jeffreys began her studies, high attrition rates for the rigorous nursing curriculum were well documented (Byrd , Garza, & Nieswiadomy, 1999; Spahr, 1995). While there was no shortage of research examining attrition in higher education, including many studies involving nursing majors, no one had specifically looked at the cause or sought a solution to student attrition in nursing programs alone. Jeffrey’s most

significant contribution is her Nursing Undergraduate Retention and Success (NURS) model, as portrayed in Figure 1. With this model, Jeffreys created a framework of

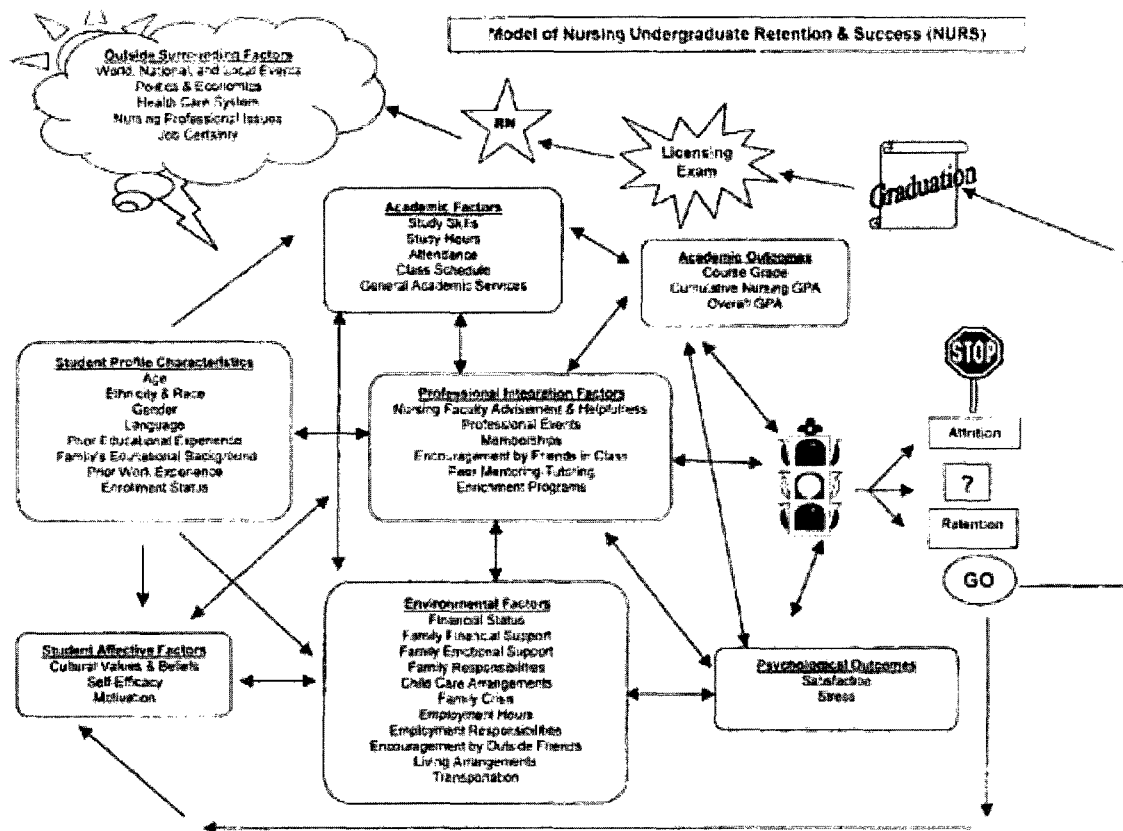


Figure 1. Model of Nursing Undergraduate Retention & Success.

From "Nursing student retention. Understanding the process and making a difference" by M. Jeffreys, 2004, New York: Springer Publishing. Reprinted with permission of the author and Springer Publishing. (Appendices A and B)

success in a nursing program. Student affective factors include cultural values and beliefs, self-efficacy which is the students' belief that they are competent to achieve a desired goal, and motivation. Academic factors, much like background characteristics, were the focus of previous theories related to retention in higher education. Previous retention theories had failed to arrive at a consensus as to which variables comprise the category of academic factors. Jeffreys (2004) proposed that for undergraduate nursing students these unique characteristics included personal study skills, study hours, attendance, class schedule, and availability of general academic services. These characteristics had a direct influence on academic outcomes. Her message regarding these factors was that these were areas that should be targeted for support in a retention plan.

It was not until Bean and Metzner (1985) identified environmental factors as an important cause of attrition for the nontraditional student that these factors were studied in higher education. Earlier theorists such as Tinto (1975) dismissed the effect of environmental variables influence on retention. It was not considered an issue as most students, it was assumed, lived on-campus, which was the center of a student's life. With the recognition of the nontraditional student, whose focus was also in the community, the focus of retention research also shifted. It was also at this time that Bean and Metzner (1985) purported that the nontraditional student environmental issues may outweigh even academic variables. Jeffreys (2004) chose the following environmental variables for her model: financial status, family financial support, family emotional support, family responsibilities, family crisis, child care arrangements, employment hours, employment responsibilities, encouragement by outside friends, living arrangements, and transportation.

Previous retention theories identified a lack of social integration into the college or university community as a major risk factor impacting student attrition. Jeffreys (2004) extended the need for such integration in her NURS model. For this model, she emphasized that the student needed to integrate not only into the general academic community but into the professional community of nurses as well. Her studies found that student-faculty relationships, peer mentoring, and enrichment programs were vital to stemming attrition in an undergraduate nursing program (Jeffreys, 1993, 1998, 2001, 2002). It was not by accident that this factor was placed at the center of the model. Her conclusions were based on the fact that the nursing faculty was at the center of professional integration by having the ability to identify barriers to assimilation into the profession as well as initiate strategies to promote retention. Interactions with students, such as advising and mentorship, affect the decision the student needs to make each semester as to whether to leave or persist. Inclusion in professional nursing events, memberships in professional organizations and faculty devised enrichment programs, positively affect retention decisions.

Jeffreys (2004) found multiple research studies that documented that students in nursing programs experience greater stress due to program requirements than the rest of the general college population. The rigors of the nursing curriculum have been duly noted in research studies (Jacobs & Koehn, 2006; Newton, Smith, & Moore, 2007; Newton, Smith, Moore, & Magnan, 2007) and can be responsible for the increased occurrence of stress that nursing students face. This stress certainly places the nursing student at greater risk for attrition.

Jeffreys' (2004) model also identified surrounding factors that can affect the students' decision to stay or drop out. The economic climate, as well as health care policies affects how students feel about their choice of major. Students are bombarded daily with these issues and how it may affect their ability to pay for school, as well as their future ability to pay off loans secured to pay for college. These factors have an important effect on a student's decision to stay or go from the program they are involved in. Using the Jeffreys's model as a prescriptive tool, identification of areas in need of support among the variable sets would lead to increase student retention in a nursing program.

Closer Look at Student Characteristics

In the current study, only selected variables of student profile characteristics and academic outcomes from the Jeffreys' model are expanded in this literature review. This study analyzed specific student profile characteristics and academic factors and their connection to success in a nursing program. Nursing literature is replete with studies attempting to identify predictor variables for success in a nursing program. The most researched variables include standardized testing specifically designed for pre-entrance into nursing programs and their predictive scores for reading and math (Byrd, Garza, & Nieswiadomy, 1999; Higgins, 2005; Potolsky, Cohen & Saylor, 2003). Jeffreys (2004) identified these prior experiences as including pre-college variables, such as high school performance, and pre-nursing variables such as prerequisite grades on required courses for admission into a nursing program. With the admission of a diverse population of students, including traditional and nontraditional students into nursing programs, the importance of high school GPA as an accurate predictor is diminished (Jeffreys, 2004).

However, she does support classification of schools (both high school and colleges), by their consistent production of students prepared or underprepared for the rigors of college. To further investigate the importance of these educational background variables, a literature review must include pre-nursing standardized testing resulting in identification of a student's competence in reading and math and their impact on success in a nursing program.

Standardized Testing and Nursing Program Success

In recent years, one of the first steps for students applying to a nursing program is some type of standardized testing. Research studies have found a significant correlation with results of standardized scores and success in a nursing program (Abdur-Rahman, Femea, & Gaines, 1994; Newton, Smith, Moore, & Magnan, 2007; Sayles, Shelton, & Powell, 2003; Simmons, Haupt, & Davis, 2004). The most closely examined results from these standardized tests have been the evaluation of the scores indicating reading comprehension, mathematical ability, and science ability.

Abdur-Rahman, Femea, and Gaines (1994) discovered a significant statistical correlation between success in first-year nursing courses to the students' results on the Nursing Entrance Test (NET) for reading comprehension, math and overall composite score. The NET is one of many standardized tests developed by Educational Resources Incorporated. (ERI) and used by diploma, associate degree, and baccalaureate schools to provide scores evaluating student essential skills prior to admission. The basic cognitive skills evaluated are math, reading comprehension and rate, critical thinking appraisal, test taking skills and learning styles, and the non-cognitive skills of stress and social interaction (Educational Resources, Inc., 2004). A study by Abdur-Rahman, Femea, and

Gaines (1994) said the NET reading and math scores accounted for up to 33% of the variance in nursing grades received by students in their first semester in the nursing program.

The Test of Essential Academic Skills (TEAS) has been developed by Assessment Technologies Institute and assesses skills in reading, math, science, English and language usage (Assessment Technologies Inc, 2009). Very little research has been done on the TEAS as a predictor for success in a nursing program. Newton, Smith, Moore, and Magnan (2007) found that the predictive standardized test, known as the TEAS, was able to add to the predictive value of previous grade point average (PGPA) when looking at first nursing semesters grade point averages. An examination of scholastic aptitude (as measured by the by the PGPA) and nursing aptitude (as measured by the TEAS), Newton et al (2007) revealed that that both of these independent variables had a significant effect on first-semester grade point averages. This effect was responsible for 20.2% of the variance in first semester grades. More specifically 15.4% of the variance was caused by the scholastic aptitude. Also implied from this study is that the result of a standardized test, such as the TEAS, can identify student deficiencies that are susceptible to remediation (Newton et al. 2007).

Health Education Systems Incorporated (HESI) also produces a standardized test to measure math, basic English (including vocabulary and grammar) and sciences. Murray, Merrinan, and Adamson (2008) explored the statistical significance of the HESI in predicting success in an associate degree program and in a baccalaureate program. In this study, the HESI predicted 100% of the success rates of students in the first semester of the associate degree program and 88.89% in the overall program. In the baccalaureate

program the scores were not as predictive of success. The study indicated the test scores had only an 80% correlation with first semester grades and only a 50% correlation in the overall program. There has not been sufficient research related to which of these standardized tests are more reliable than another. The message that the present research speaks to, however, is that results of these tests may be more indicative of students overall ability than previous grade point averages.

Math Aptitude and Success

The significant role that mathematical ability plays in retention rates for nursing students has been well-documented in the research (Ellis, 2006; Murray, Merriam, & Adams, (2008); Sayles, Shelton, & Powell, 2003). In 2007, Newton, Smith, Moore and Magnan reported that the Test of Essential Academic Skills (TEAS) math scores, one of several nursing program preadmission tools, were able to predict first semester attrition. Abdur-Rahman, Femea, and Gaines (1994) found that the Nursing Entrance Test (NET) math testing of graduating students, when compared to their incoming math scores, were significantly higher in the post test. Statistically they found that the NET reading and math scores accounted for up to 33% of the variance in nursing grades received by students in their first semester in the nursing program. Another study found the preadmission score achieved on a standardized math test was significantly related to those students passing a medication calculation test given in a baccalaureate nursing program (Newton, Harris, Pittiglio and Moore, 2009). The medication calculation test needed to be passed at the 90% level in order for the student to continue on with nursing courses. Bliss-Holtz (1994) surmised that the mathematical skills needed in medication administration require arithmetic calculation skills as well as understanding mathematic

concepts allowing the student to formulate correct proportions for medication dosing.

While a calculator can improve arithmetic skills, understanding how to formulate correct proportions prevent the student for moving forward with their nursing studies (Newton, Harris, Pittiglio and Moore, 2009).

The ability to mathematically calculate drug dosages is a critical skill for registered nurses. The Institute of Medicine (IOM) has been at the forefront of publically reporting on the serious nature of the amount of medication errors that occur daily in our nation's hospitals. The IOM's 2000 *To Err is Human*, reported that medication errors result in death to 7,000 patients per year. Segatore, Miller, and Webber (1994) also provided data that 11% to 14% of all medication errors can be traced backed to miscalculation of drug dose.

The math skills most frequently required of nursing students are the ability to set up and solve proportions and the ability to work with decimals and fractions. This places the proficiency ability for math at a seventh grade level (Polifroni, McNulty, & Allchin, 2003) Worrell and Hodson in 1989 discovered that 83% of nursing programs reported difficulties with student nurses' math competencies. Some research promotes the belief that nursing students do not possess basic math skills (Bindler & Bayne, 1984; Blais & Bath, 1992). Blais and Bath (1992) suggested that students be remediated in word problems rather than computational skills which is the basis of many non-nursing remediation courses. Even more startlingly is the fact that studies have shown that newly graduated nurses employed by hospitals are unable to pass medication proficiency exams given as a requirement of hiring (Polifroni, McNulty, & Allchin, 2003). Some of the

reasons given for this lack of proficiency in math skills are test anxiety and lack of practice.

Pozehl (1996) studied two groups of college students. One group consisted of nursing majors, and the second group of non-nursing majors. The variables tested included; scores on algebra skills test, pretest state anxiety and the number of previous algebra courses taken. Nursing students scored significantly lower on the algebra skill test. In the nursing group only 17.9% of students passed with a score of 70% or better when compared to the non-nursing group in which 71.4% of students achieved a score of 70% or better. Pretest math anxiety was higher for the nursing students. The means for the number of algebra courses taken was basically the same for both groups. Pozehl (1996) suggested pretesting nursing school applicants prior to admittance into the program remediating as needed prior to admittance into nursing courses and be academically supported throughout the curriculum.

Reading Aptitude and Success

Several studies point to the positive connection between reading ability and success in nursing programs in community colleges (Boughan, 1993; Dean & Fischer, 1992; Donsky & Judge, 1981). Belcher (1993) found that success rates in the first semester of nursing courses at the community college level were positively related to reading skills and repeats of prerequisite science courses. Students with a deficiency in reading skills, even after remediation, received lower grades in nursing leading to attrition or at least increased time to graduation. Of interest was that even students assessed as marginal in reading skills, with no required remediation, were less likely to persist to graduation than the remediation group. The final results of Belcher's (1989)

study revealed that 90% of the students with adequate reading scores maintained a GPA of 2.0 or better. In the group of students that need remedial math courses only 65% were able to maintain a GPA of 2.0 or better. Porter (2008) in a review of retention literature in associate degree nursing (ADN) programs noted low scores in reading comprehension found on standardized testing correlated with attrition. A positive relationship between reading and math aptitude was also found by Abdur-Rahman, Femea, and Gaines (1994). For many nursing students today English is a second language. For these students, cognitive academic language proficiency can only be acquired by years of reading academic texts (Abriam-Yago, Yoder, & Kataoka-Yahiro 1999).

Gallagher, Bomba, and Crane (2001) examined individual measures tested on two standardized tests, the Registered Nurse Entrance Exam (RNEE) and the Nursing Entrance Test (NET), to determine their predictive value on course grades in the first semester of nursing studies. Their research confirmed a significant connection ($r = 0.23$, $p < 0.05$) between success in an ADN nursing program and a score of 59 (on the RNEE) for reading comprehension and an increased success rate in their first semester. Preadmission tests such as the Nursing Entrance Test (NET) used by the college of nursing studies are used to document reading ability and the need for remediation if necessary. Research has found that students who receive less than 55% on the NET reading comprehension score are at increased risk for attrition from a nursing program (Abdur-Rahman, Femea & Gaines, 1994; Symes, Tart, Travis & Toombs, 2002).

In a 2005 study by Symes, Tart, and Travis at Texas Woman's University in Houston, faculty recognized that students with low reading comprehension scores on pretesting were less likely to be successful in the first year of nursing school. One thought

was to deny admission to those tested whose scores fell below the 55% level. Rather than deny admission to these students (who were very often found to be minority students) the faculty decided to provide remediation for the identified students. Using the Nurse Entrance Test as a diagnostic tool, students who scored less than 55% on the reading comprehension test were targeted as in need of remediation and placed in a Nursing Success Program (NSP). The success rates of the students with reading comprehension scores less than 55% jumped from 48% to 81%, rates comparable to their peers who were not involved in the program. In a similar study at Texas community colleges, Higgins (2005) documented a statistical correlation between reading, science, math, and program completion, again suggesting that preadmission testing of nursing students and subsequent remediation will lead to increased retention of students. Finally, Lockie and Burke (1999) developed a retention program at their college of nursing for at-risk nursing students. The college compiled data that revealed students entering the nursing program were academically underprepared to meet the rigors of a nursing curriculum at the college level. One of the target areas in this program was remediating reading skills of students admitted to the program. The overall results of the study found that at-risk students enrolled in the program, when compared to a control group of at-risk students not exposed to the retention program, achieved a retention rate of 90.1 %, while the control group retention rate was 56.2%. A positive correlation between the Assessment Technology Institute (ATI) reading score and success in a nursing program was found by Ukpabi in 2008. The connection of math and reading ability to success in a nursing program has been well-documented (Crane, Wright, & Michael, 1987; Higgins, 2005; Murray, Merriman, & Adamson, 2008; Sayles, Shelton, & Powell, 2003).

Community College Transfer Students and Retention

The community college's creation in the early 20th century was based on three basic purposes. The first was to act as a release valve to unburden prestigious colleges from having to admit the growing population of high school graduates. It was also to function as a training facility for the much needed workers for a recently industrialized nation. Finally, it was seen as the answer to a demand for a more educated populous (Cohen & Brawer, 2008)

Between 1924 and 1960 the number of students graduating from high school jumped from 30% to 75%. At the same time the benefits of additional education, even one or two years, beyond high school were being appreciated. Early educational leaders proposed that universities relinquish the task of educating freshman and sophomores, and focus their efforts on creating senior colleges admitting only junior and seniors, thereby establishing the transfer function of the community college (Cohen & Brawer, 2008). The transfer function remains today as one of its most important roles (Glass & Harrington, 2002). This utility of the community college was seen as its primary purpose in the 1950s (Cohen & Brawer, 2008; Lee, Mackie-Lewis, & Marks, 1993). In this decade almost 50% of students enrolled in the then named "junior" colleges, transferred and were successful in attaining a bachelor's degree. By the 1970s the gap between transfers and native students attaining their bachelor degrees rose to almost 22%, with native students graduating at a 55% rate. This change appears to have been the result of a diversification of services by the community colleges themselves. The mission of the colleges became more vocationally focused and the transfer functions diminished (Eddy, Ray, & Rao, 2006; Jones & Lee, 1992; Lee, Mackie-Lewis, & Marks, 1993).

Fredrickson (1998) describes the typical community transfer student as female, age 26, who more than likely would have been enrolled in a transfer program prior to leaving the community college. The student would not have been granted an associate degree as she would have completed an average of only 22 hours of a needed 64 to attain such a degree. Her GPA would have dipped slightly but recovered by the end of the first year. The students studied by Fredrickson consistently moved from part-time status at the community college to full time at the university. Chosen majors included education, business, and psychology, with the study of nursing the choice for one out of 10 students in this study.

Research studies today present conflicting views about whether or not students who start at a two-year community college are more likely or less likely to eventually earn a baccalaureate degree. The general consensus among researchers is that a student starting at a community college decreases their chances of obtaining a bachelor's degree within 6 years (Alfonso, 2006; Anglin, Davis, & Mooradian, 1995; Bowen, Chingos, & McPherson, 2009; Doyle, 2009; Hagedorn, Moon, Cypers, Maxwell, & Lester, 2006). While 80% of students who enter the community college have attainment of a baccalaureate degree as their goal, only about 21% actually do so within six years (United States Department of Education, 2005). Alfonso (2006) reports that a student entering a two year community college with aspirations of eventually obtaining a baccalaureate degree have decreased their chances of doing so by 21% to 33%. He also makes the point that most studies looking at this phenomena may only look at a six year to eight year window for degree completion. Many community college students attend

part time and may continue to do so at the four year level, thereby increasing the time to baccalaureate graduation.

One of the most cited researcher probing the academic success of community college transfer students is Dougherty (1992). Dougherty analyzed previous national longitudinal studies data looking at community college students who transfer to four year universities. His purpose was to analyze these surveys while controlling for basic student differences. He studied matched community colleges and native university students and compared graduation rates. He found that even by matching student characteristics community college students were still 11 to 19 percent less likely to graduate after transfer than if they had started at a 4-year institution. He suggests that it is the fault of the four year institutions that diminishes the community college transfer students' aspirations. He states that the institutions often create barriers that inhibit the transfer students' success, and removing these barriers would increase the success of these transfer students. Dougherty suggests cooperative agreements such as making community colleges "branches" of state universities (Dougherty, 1992). Today the idea of "seamless" entry for community college transfer students is one receiving much attention (Halperin, 2009).

Research findings that transfer students can and do as well as native students exist but are not as plentiful as the previous studies reviewed (Anglin, Davis, & Mooradian, 1993, 1995; Bryant, 2001; Jones & Lee, 1992; Lee & Frank, 1990; Lee, Mackie-Lewis, & Marks, 1993). Johnson (2005) reports in a study comparing transfer students versus native students that no statistically significant difference in performance was noted studying these two groups. Falconetti (2009) found that when he compared academically

final GPA's, there was no statistically significant difference between the two groups. Johnson (2005) comes to the same conclusion although, neither researcher speaks to whether or not these two groups differed in graduation rate. Piland (1995) suggests that the community college transfers most likely to persevere to graduation are those who transfer with a specific major in mind and have course agendas completed.

Transfer Shock

Hills (1965) initially defined the drop in grade point average, between .30 and .50, experienced by community college students in their first semester in a four-year university as "transfer shock". Using a retrospective approach looking at more than 20 studies on students who Hills (1965) came to the conclusion that some degree of transfer shock, defined as a drop in GPA in the first semester post transfer, was felt by more than 90% of those studied. He also found that less than 10% failed to recover to some degree after the first semester. His review of the existing research also supported those who had discovered that transfer students do not graduate at the same rates as native students, and if they did they took longer to reach that goal. His initial queries into why this happened included student issues or institutional failings. These questions would be studied extensively over the next 45 years.

Rhine, Milligan, and Nelson (2000) proposed that the experience of transfer shock was rooted in Tinto's academic and social integration theories. In community colleges, Piland (1995) reported that students benefitted from an environment focused on the student attaining skills to be successful in whatever choice they make academically or vocationally. The smaller size of community college classes led to more individual attention than students received in large lecture halls most common in four-year

universities (Piland, 1995). Most researchers have agreed with Hill that transfer shock is a reality (Carlan & Byxbe, 2000; Diaz, 1992; Dougherty, 1992; Ishitani, 2008; Keeley & House, 1993). Some have found that transfer shock may depend on a student's major, and that some students may even experience an increase in GPA after transfer (Cejda, 1997; Cejda & Kaylor, 1997; Cejda, Kaylor, & Rewey, 1998). Cejda (1997) explored whether or not transfer students in various majors had varying levels of transfer shock. The outcome of this research indeed found that mathematics and science majors as well as business majors did experience greater transfer shock than the mean of the entire group studied. Fredrickson (1998) introduced the term "transfer ecstasy" when he found a number of students whose GPA increased in the first semester after transfer. Transfer ecstasy is an increase in GPA that was found in "education, fine arts and humanities and social science groups who had an increase in GPA of 0.024, 0.268 and 0.041, respectively" (p.285). Later in 1997, Cejda and Kaylor investigated whether academic performance or specifically transfer shock, differed at public colleges and universities versus private, liberal arts colleges. What they found was that although the private liberal arts transfer students experienced a decrease in GPA their first semester after transfer, it was lower than those who transferred to public universities or colleges.

Literature searches conducted to gather studies of community college students transferring, prior to receiving a nursing degree, to a four year university found that these studies are almost non-existent. The realization that low retention rates prevent baccalaureate programs from producing the number of graduates needed to combat the present nursing shortage is well-documented. Most of these studies focus on programs developed for student remediation over the past 10-15 years without producing any real

improvement in attrition rates (Arathuzik & Aber, 1998; Symes, Tart, & Travis, 2005). The bulk of the studies concern intervention programs aimed at facilitating retained students' success on the National Council Licensure Examination (NCLEX) (Seldomridge Dibartolo, 2004). The literature is also rich in the examination of admission testing used in attempting to predict the most successful nursing student candidates. Even though more four year universities are enrolling community college students in their majors, the studies found are generic in nature with nursing mentioned only in passing. The few studies related to the transfer of community college students into a nursing program have based their literature reviews on these aforementioned generic studies (Cameron, 2005; Newton, 2008; Peter, 2005).

Community College Students Who Transfer to Private, Liberal Arts Colleges

Most research on transfer students involves transfer to public colleges and universities. There is very little research available related to students who transfer into private, liberal arts colleges. Greene (1985) identifies liberal arts colleges as being smaller allowing for students to feel more a sense of community with their fellow students. Research has clearly shown that a more individualized professor-to-student relationship results in increased retention in higher education (Shelton, 2003). Cejda (1999) addressed this gap in a study of community college transfer students and transfers to private, liberal arts colleges. The results of this study covering a span of five years starting in 1993, found that initially slightly less than half of all students that transferred from a community college not only did not suffer from transfer shock, but actually saw an increase if not stabilization of their admission GPA (Cejda, 1999).

Community College Transfer Students and Retention in Baccalaureate Nursing Programs

Literature searches for “community college transfer students” and “baccalaureate nursing programs” most often only cited Cameron’s (2005) study. Cameron collected quantitative, as well as qualitative data, on community college students transferring into a baccalaureate nursing program designed collaboratively to follow two years in a Canadian pre-RN program. In Ontario Canada, where this study took place, the level of education required to enter into practice as a registered nurse has recently become the baccalaureate degree. Therefore “seamless” programs involving community college transfers have been developed (Cameron, 2005). This is much different than in the United States where our system allows graduates of diploma (three years), associates degrees (two years) or baccalaureate (four years) to all sit for the same entry test to be licensed as a registered nurse (AACN, 2006). The Canadian system designed to facilitate transfer, removes some of the barriers to transfer that American community college students face (Cameron, 2005). Cameron’s initial dissertation study predates the work of Jeffreys’ (2004) study of nontraditional nursing students, who are often transfers from community colleges. As she reports, no model exists to explain this transfer process. She develops a

proposed model (Figure 2) that is very similar to Jeffreys' model. Cameron (2005) found

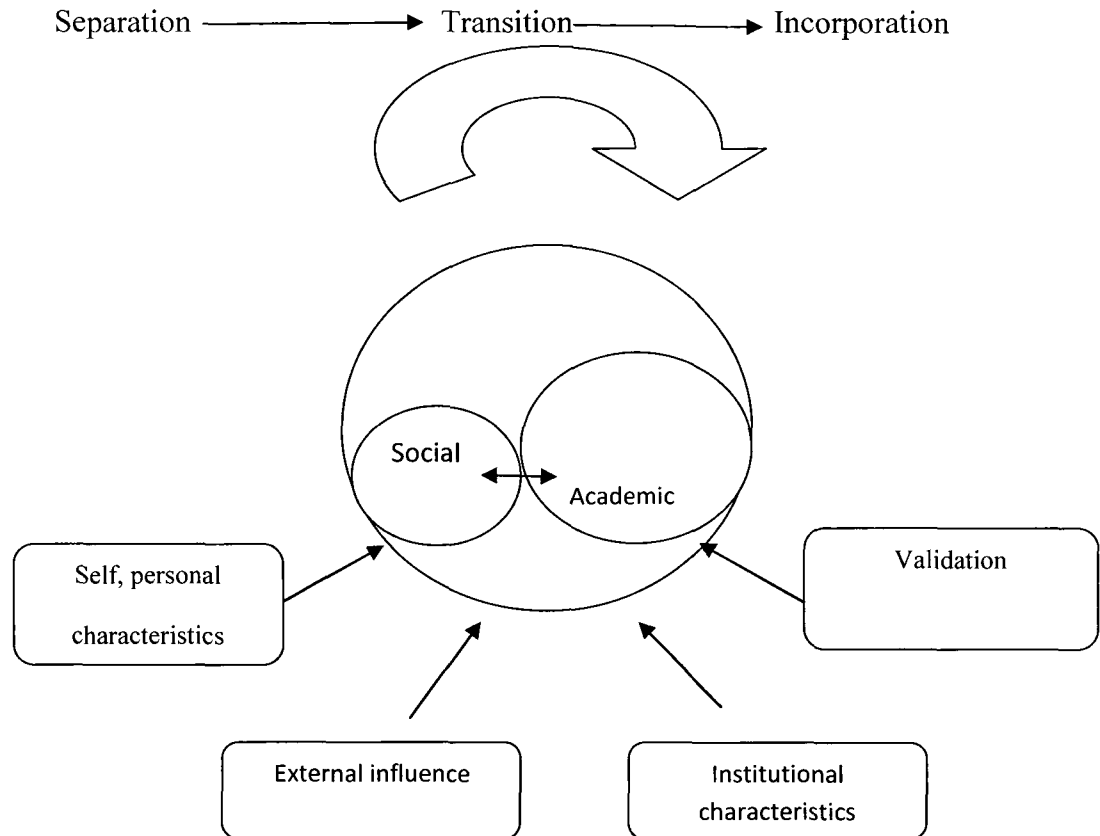


Figure 2. Cameron's conceptual model of the persistence and transition of the community college transfer student.

Adapted from "Experiences of Transfer Students in a Collaborative Baccalaureate Nursing Program" by C. Cameron, 2005, *Community College Review*, 33, p. 25. Reprinted with permission of the author and publisher (Appendices C and D).

that even in a program designed to facilitate transfer between the community college and the baccalaureate program, students still felt overwhelmed when they entered the four year college setting. Specifically they felt unprepared for the amount of reading as well as the sophistication of those reading assignments. They were also surprised by the expected commitment of handling a much heavier course load than they had to assume during their first two years. Finally, they were challenged by the mandate to think more critically in difficult situations. While they knew they would experience a need to decrease social activities, they were unprepared to cut back on these activities to the level required for success with their studies (Cameron, 2005). This decrease in social interaction, as learned from Tinto's (1975) theory, affected integration into the institution so as to ensure student retention.

Newton (2008) reviews the scarce literature available that examines community college preparation prior to transfer into a four year nursing program. She advises that while in some baccalaureate nursing programs graduation rates are so poor, that only half of those admitted graduate, little study has been dedicated to looking at where students complete their prerequisites and its relationship to graduation. The grades of the prerequisites will often determine whether or not a transfer student is admitted into the nursing major (Newton, 2008; Seldomridge & Dibartolo, 2004). As described earlier in this paper, transfer shock is a phenomenon experienced by many transfer students affecting their first semester GPA at the transfer institution. The expected GPA drop for a student in general studies may mean little. The same drop in a nursing major may be reason for probation or even dismissal. Newton identifies a gap in the literature regarding prerequisite preparation especially at a community college level. She calls for empirical

studies researching community college students' preparedness for successful entry and graduation into a four year nursing baccalaureate program (Newton, 2008).

Summary

Facing the largest nursing shortage in history, while at the same time needing to provide health care for the largest groups of older adults ever seen, will soon become a reality (Buerhaus, 2009; Buerhaus, et al., 2009). Attrition rates of as much as 50% are seen in schools of nursing, while almost 150,000 potential students are turned away each year from schools due to lack of space (AACN, 2006; Buerhaus, et al., 2009; Jeffreys, 2004; Kuchen, 2007). The brightest and best potential nursing students often choose career paths offering more money, prestige and less demanding lifestyles (Buerhaus, et al., 2009). What can be done then to increase the number of nursing graduates in the coming years?

Early retention theories centered on the traditional student and their college experience. In the 1980s the environment of the college campus changed with the arrival of the "non-traditional" student. This student was much different than the traditional students previously studied. Today's college campuses are populated by a mix of these students, all with individual needs. Needs that must be identified and addressed if retention is to be increased in higher education.

Current retention research includes almost every major except nursing. Theories formed from these empirical studies may or may not apply to students enrolled in higher education majors in nursing. A gap exists in the research literature that this study proposes to fill. The purpose of this preliminary study is to identify predictor variables that are related to persistence of students in a registered nursing program at a mid-sized,

private, Midwestern, Catholic, liberal arts university. This study will address that gap by not only looking at community college students transferring into four year universities, but even more specifically their transfer into a private, liberal arts university. The university studied admitted nursing students at the sophomore level between 2001 and 2007. The ratio of native students, those that had started at the designated study site as freshmen, to community college students was almost one to three, indicating that the numbers of community college transfer students has an overwhelming effect on retention issues. No longer can we ignore whether or not community college students transferring into a four year university matter. Research needs to look more closely as how they compare to their native counterparts and which group is more successful. The following study will shed some light on that question.

CHAPTER III: METHODOLOGY

Introduction

The purpose of this chapter is to identify the research design, methodology and procedures by which this study was conducted. Initially it will review the purpose of this study and restate the research questions from which it flows. A description of the population studied will precede a detailed description of the research design chosen. The setting from which the population was chosen along with how population samples were obtained follows. Next, the procedure for data collection and data analysis will be explained, and finally the statistical techniques employed to analyze the data will be identified.

The purpose of this preliminary study was to identify predictor variables that are related to persistence of students in a baccalaureate nursing program at a mid-sized, private, Midwestern, Catholic, liberal arts university. This study compared success rates, as determined by retention to graduation, of community college transfer students to native students in a baccalaureate program at a mid-sized, private, Midwestern, Catholic, liberal arts university. In addition to examining retention to graduation rates between the two groups, any association between math and reading scores, as measured on a standardized test, as predictor variables possible impacting success of the groups was studied. The expectation is that factors indicating future success in a nursing program may be identified and strengthen nursing major admission requirements used to choose the most viable nursing student candidates. The research questions of this study are:

Research Questions

1. Is there a statistically significant difference at alpha level .05, in the percentage of native students compared to community college transfer students who are retained to graduation and students from each group who are not retained in the nursing program at a private, Catholic, liberal arts university admitted into nursing courses from fall 2001 to spring 2007?
2. Is there a statistically significant difference at alpha level .05, in the math scores, as reported on the Nursing Entrance Test (NET), for students admitted to nursing courses from fall 2004 to spring 2007, of native students compared to community college transfer students who are retained to graduation and students from each group who are not retained in the nursing program at a private, Catholic, liberal arts university?
3. Is there a statistically significant difference at alpha level .05, in the reading scores, as reported on the Nursing Entrance Test (NET), for students admitted to nursing courses from fall 2001 to spring 2007, of native students compared to community college transfer students who are retained to graduation and students from each group who are not retained in the nursing program at a private, Catholic, liberal arts university?

Research Design

Ex post facto or causal-comparative research is a study of events that have happened in the past in an attempt to uncover a cause and effect association related to a specific outcome. It is nonexperimental in that events that have already occurred cannot be manipulated by the researcher. This type of research can be thought of as experimental

research in reverse. Two groups of participants will achieve an outcome, and then the researcher goes back in time in an effort to find a variable that may have caused that specific outcome (Cohen, Manion, & Morrison, 2000). The researcher must be careful not to assume that this type of study can definitely prove that some variables were the cause of the outcome. This identification of a cause can only become more likely when more ex post facto research studies are completed by different researchers with different groups identifying the same variable as a possible cause of the outcome, or experimental studies employing this variable verify the results (Lodico, Spaulding, & Voegtler, 2006).

The research design was a quantitative, causal-comparative, nonexperimental study. Descriptive methods were employed to determine if any significant relationship exists between variables. This study looked at overall retention rates, defined as persons who graduate from the chosen nursing program within six semesters of starting nursing courses. The data used was selected using a census sample collected from all students who met specified criteria (as defined below) and who entered the five semester course of study beginning in fall 2001 and ending in spring 2007. The causal-comparative study, also known as ex post facto research, was chosen to study existing data describing selected variables and comparing those variables, as in this study, between two specific groups. To employ this type of research certain conditions need to be met. First, is the desire to determine whether or not some type of causal relationship exists between variables. Second, the purpose is to study the effectiveness of requirements generally known to result in a favorable outcome, without restricting availability of those requirements to one group or another. Third, two groups that differ in outcomes can be studied and compared (Orcher, 2005). All three conditions have been met for this study.

The population used in this study consisted of two groups of nursing students who began their nursing courses between fall 2001 and spring 2007. The first group, defined as natives, was composed of students who entered a private, Catholic, liberal arts institution as freshmen. By definition, this group's members consisted of students who started their postsecondary education at the university studied and transferred in less than six credit hours. The second group consisted of community college transfer students who transferred in more than six hours from a community college upon entrance into the nursing major. The nursing program admitted a new cohort of students every fall and spring. The initial number of students admitted during this time was 380. Eight-two of these students met the criteria of the native student described as students who started their postsecondary education at the university studied and transferred in less than six credit hours, and 177 of the students met the criteria of the community college transfer student who transferred in more than six hours from a community college upon entrance into the nursing major. Those transfer students not eligible for the study numbered 121. These 121 students had transferred from a school other than a community college into the university studied. Due to the relatively small size, the entire population of students was included in this study. This may be referred to a census sample. The most significant drawback to this technique is its lack of being generalized to a larger population (Lodico, Spaulding, & Voegtler, 2006).

Setting

The population studied attended a mid-sized, Catholic, private, liberal arts university situated in the suburbs of a large Midwestern city. The university enrolls approximately 6,000 students in almost 80 undergraduate majors and programs of study,

plus 22 graduate programs and advanced certificates of study. Almost 1,600 students reside on-campus, with the rest commuting from the nearby area (Lewis University, 2009).

Instruments

The institution, like many nursing programs, has been struggling with first semester attrition rates of approximately 30% to 40%. An additional loss of 5% to 10% of the continuing students was typically seen during the four remaining semesters of nursing courses leading to graduation. The population studied was composed of students, both native and community college transfers, who were admitted to the nursing program between fall 2001 and spring 2007. Prior to admission into the five semester nursing curriculum, students needed to meet specific admission requirements that are believed to predict successful completion of the nursing curriculum. These requirements included the Nurse Entrance Test (NET), successful completion of designated general education courses as well as specific science courses (which must be passed with a “C” and only repeated once), and a grade point average of 2.75 or above.

The NET was developed by a national group of educators selected as possessing significant knowledge of both teaching and academic counseling in health profession programs (Frost, Jarvis, Haupt, Lancaster, Tuttle, & Simmons, 2003). These educators formed an examination board that oversaw questions that would be included in the test. Statistical analysis was completed on each test item, and the following considerations were reviewed. First, does the test item differentiate between a student who possess the reading and math ability to succeed in a health care occupation, and those who lack that level of ability? Can the question reveal an accurate level of stress experienced by the

student answering the question? Does the question identify a specific learning style used by the student? If these questions were not answered the test item was discarded. Subtest reliability was accomplished by use of the “parallel forms method” (Frost, et al., 2003, p.9). The subtest reliability coefficient for reading was +.98, and +.81 for math. Content validity, criterion-related validity, and diagnostic validity were also established. Content validity was assured by guidelines decided by the Examination Committee. Their decisions were based on information received from a national survey of nursing educators defining what they needed to know from this test. Criterion-related validity identified correlation of NET results to those of ACT results. This was especially important to this study as ACT scores were generally not collected from community college transfer students. These overall correlation scores ranged from +.79 to +.83, establishing a significant relationship between the NET and ACT. Diagnostic validity was determined by administering the NET to graduating students in their last month of school. It was expected that these students would score substantially higher than entering students. Statistically significant score increases were recorded (Frost, et al., 2003).

The Nurse Entrance Test results in scores for both math ability and reading comprehension. The candidates must pass the math test with a score of 66 and above, and the reading component with a score of 55 and above. The NET is one of many standardized tests developed by Educational Resources Incorporated (ERI) and used by diploma, associate degree and baccalaureate schools to provide scores evaluating student essential skills prior to admission. The basic cognitive skills evaluated are math, reading comprehension and rate, critical thinking appraisal, test taking skills and learning styles, and the noncognitive skills of stress and social interaction (Frost, et al., 2003).

During the years included in this study, 2001 to 2007, any native student or community college transfer student was required to enroll in a remedial course for math and or reading if they failed to pass either math and/or reading. This course would need to be passed with a “B” or better to remain in the nursing program.

Data Collection

This study was retrospective in nature so the data had already been collected and housed at the institution studied. Individual student files including the results of the NET, transcripts from previous schools, and anecdotal notes describing reasons for attrition reside in a locked file area in the College of Nursing. The university’s data system allowed access to transcripts including GPA’s and individual course grades. Once appropriate IRB approval (see appendix E) was received, these records were accessed and data catalogued for use in this research study. Spreadsheets were used to collect the data composed of demographics, admission test NET scores, grade point averages and graduation, failure and dropout rates. Students’ anonymity was assured by using numbers and class designations to code each case and cross-reference the information in a way that it can be retrieved if needed. During data collection retrieved information was stored in a locked cabinet, again to protect student confidentiality. The information obtained was reported in the aggregate to prevent any identification of participants studied.

It was hoped that anecdotal notes would also be available to document the reason for attrition if other than academic, however, that was not the case. Not all students in the study had reported NET math scores. While NET reading scores were required for all students during the time period studied, the NET math score was not required until fall 2004. According to the Coordinator of Student Retention (personal communication, May

26, 2010), math scores before the fall 2004 requirement were reported using the *Descriptive Tests of Mathematics Skills in Arithmetic Skills* developed by the Educational Testing Service (ETS) in 1988. If the student received below a 77% on the ETS math test, the student was required to complete a nursing program generated “bridge course” as remediation. The math remediation course was pass or fail. If the student failed to achieve a passing score on the second ETS math test administered after remediation, the student was denied admission to the nursing program. Due to different progression through their freshmen and sophomore years, it was not until spring 2006 that all students entering the nursing program had the required NET math score rather than the ETS math score. The date the student was admitted as a freshman, or transfer student, determined the math requirement for admission, therefore, some students in semesters fall 2004 to spring 2006 did not have the reported NET math scores.

Data Analysis

The data secured was from students who matriculated into nursing courses between the fall 2001 and spring 2007 in the university studied. Statistics collected from the census sample included:

- age
- GPA upon entering nursing courses, end of first semester and at graduation;
- student status (native or CCT);
- reason for attrition (academic or non-academic);
- readmission to program or denial to readmission after dismissal;
- math NET results (pass or failure with mandated remediation);
- reading NET results (pass or failure with mandated remediation);

- number of semesters taken to graduate;
- the number of native students retained to graduation within six semesters of entering nursing courses and those who did not;
- the number of community college transfer students retained to graduation within six semesters of entering nursing courses and those who did not.

To respond to research question number one, the mean percentage of native students retained to graduation was compared to the mean percentage of the community college students retained to graduation. Data regarding student age and cumulative GPA was also collected to discover any connection of age and/or cumulative GPA to persistence of each group studied. A chi-square test for independence was utilized to determine if statistically significant differences existed, at the alpha .05 level, rather than caused by sampling error. Data related to research question number two identified any significant difference in math scores received on the NET by the native students and community college transfer students who were retained to graduation (persisters) versus those who were not retained (non-persisters). A t-test for independent samples was employed to test for significance. Research question number three identified any significant difference in reading scores received on the NET by the native students and community college transfer students who were retained to graduation (persisters) versus those who weren't retained (non-persisters). A t-test for independent samples was employed to test for significance.

The *t*-test for statistical significance identifies whether the results obtained indicate a true difference between groups, or that the difference is caused by sampling error or chance alone (Levin & Fox, 2006). In this study, the t-test for independent

samples was used to compare data collected from the independent variables, which were native students and community college transfer students, to the dependent variable, which was retention to graduation. Data analysis identified results of the students' NET means in reading and math, and attempted to discover if any differences in the groups were significant at the alpha level of .05, or if they may be caused by chance alone (Levin & Fox, 2006). The intent of this study was to determine whether or not there was a difference in rate of retention to graduation between native students and community college transfer students. Furthermore, were students who needed remediation in math and/or reading graduating at the same rate as those students who didn't need remediation?

Limitations

The limitations for this study include: lack of random sampling, small size of population preventing generalizability to a larger population outside of the university studied, and use of *ex post facto* research design, which prevents assigning causality to any variable. As this study was limited to students who were admitted based on specific requirements it cannot be known, for example if students with a lower than 2.75 GPA may or may not have been successful until graduation. While the nursing curriculum ensures that students in this five year time period were exposed to the same knowledge sets, like delivery of that curriculum by specific faculty members cannot be assured, and may affect how students learn, rather than be attributable to the specific students involved.

Summary

This chapter has explained the method used in this causal comparative quantitative study and identified the data collected. The population studied was defined as well as a description of the setting in which the study occurred. Information was given about the instrument used in the admission process, the NET. The data collection process was outlined and measures to be used for analysis identified. The chapter concluded with a list of limitations affecting the study. The next chapter presents the results obtained with these methods.

CHAPTER IV: RESULTS

Chapter four presents the findings of this study examining rates of persistence to graduation for native and community college transfer students in a baccalaureate nursing program in a private, Catholic, liberal arts university. The findings presented begin with a demographic picture of the 259 native and community college transfer students who started nursing courses between fall 2001 and spring 2007. Data collected on each student include: student status (native or transfer), age, cumulative GPA upon admission into nursing courses, cumulative GPA at the end of the first semester of these courses, as well as cumulative GPA at graduation, and the number of students dismissed and readmitted into the program. Finally, data pertinent to answer each research question were documented and analyzed

The purpose of this study was to conduct a preliminary investigation to identify predictor variables that are related to persistence of students in a baccalaureate nursing program at a mid-sized, private, Midwestern, Catholic, liberal arts university. All analyses were completed using SPSS 16.0 for Windows. This study compared success rates, as determined by retention to graduation, of community college transfer students to native students in a baccalaureate program at a mid-sized, private, Midwestern, Catholic, liberal arts university. In addition to examining retention to graduation rates between the two groups, any association between math and reading scores, as measured on a standardized test, as predictor variables possible impacting success of the groups was studied. The expectation is that factors indicating future success in a nursing program may be identified and strengthen nursing major admission requirements used to choose

the most viable nursing student candidates. The research questions which guided this study are:

Research Questions

1. Is there a statistically significant difference at alpha level .05, in the percentage of native students compared to community college transfer students who are retained to graduation and students from each group who are not retained in the nursing program at a private, Catholic, liberal arts university admitted into nursing courses from fall 2001 to spring 2007?
2. Is there a statistically significant difference at alpha level .05, in the math scores, as reported on the Nursing Entrance Test (NET), for students admitted to nursing courses from fall 2004 to spring 2007, of native students compared to community college transfer students who are retained to graduation and students from each group who are not retained in the nursing program at a private, Catholic, liberal arts university?
3. Is there a statistically significant difference at alpha level .05, in the reading scores, as reported on the Nursing Entrance Test (NET), for students admitted to nursing courses from fall 2001 to spring 2007, of native students compared to community college transfer students who are retained to graduation and students from each group who are not retained in the nursing program at a private, Catholic, liberal arts university?

Demographics

Table 1

Demographic Characteristics of the Sample Native and CCT Persisters and Nonpersisters

Characteristics	Native		CCT	
	Persisters	Nonpersisters	Persisters	Nonpersisters
Number	48 (58.5%)	34 (41.5%)	88 (49.7%)	89(50.3%)
Age				
Under 25	48	33	64	58
25 and older	0	1	24	31
Admit GPA mean	3.44	3.10	3.39	3.12
End 1 st semester GPA mean	3.39	2.96	3.14	2.68
Graduation GPA mean	3.19	3.00		

As indicated in Table 1, a total of 259 students participated in the study.

The proposed data collection procedure for the study were to include identification of the student's reason for attrition and the number of students dismissed and readmitted during the time frame studied. This information should have been included in the student files in anecdotal notes. It was found that not all files of those students who did not persist, contained anecdotal notes documenting reason for attrition. It was possible to determine which students dropped out of the program with failing grades compared to those who left the program in good academic standing with all grades "C" and above in nursing courses. Of the 123 students who did not persist, 115 students left the program with grades of "D" or below in nursing courses. Only eight students left the program in

good academic standing with all grades “C” and above in nursing courses. To address the issue of students dismissed, data were collected that identified number of semesters each student who persisted in the nursing program attended prior to graduation. The nursing program in this study consisted of five semesters if completed with no stop outs or dismissals. Of the 48 native students who persisted to graduation, 74% completed in five semesters, 24% completed in six semesters, and 1% took more than six semesters. Of the 88 CCT students who persisted to graduation, 58% completed in five semesters, 31% completed in six semesters, and almost 10% completed in more than six semesters. Any student who took more than five semesters to complete the program would have either stopped out for a semester or was dismissed for failing grades and then readmitted.

Research Question One

The first research question asks whether or not the observed difference in number of students who persisted to graduation was significantly different than the expected difference in number of students who persisted to graduation. Table 2 indicates an 8.8% difference between the percentage of native students who persisted to graduation and the percentage of CCT students who persisted to graduation. As indicated in Table 3 a chi-square test for independence (Table 3) was utilized to determine if a statistically significant difference does exist. The results of the chi-square test for independence (using Pearson chi-square) indicated persistence to graduation was not dependent on the group status, native or CCT. The results were: $\chi^2 (1, n = 259) = 1.75, p = .19, phi = 0.8$. All cells had an expected minimum count of 38.94, and no cells had an expected count of less than five. It can then be concluded that in this study there is no statistically

significant difference in the number of native students who persisted to graduation when compared to the number of community college students who persisted to graduation.

Table 2

Student Categories and Persistence to Graduation (Research Question 1)

	<u>Student Category</u>				Total
	Native	%	CCT	%	
Persister	48	58.5	88	49.7	136
Nonpersister	34	41.5	89	50.3	123
Total	82		177		259

Table 3

Results of Chi-Square Test

	Value	df	Significance
Pearson Chi-Square	1.748	1	.186
Phi	.082		.186
Cramer's V	.082		.186

Research Question Two

The second research question asks whether or not there is a significant difference at alpha level .05 in the math scores as reported on the Nursing Entrance Test (NET) for

students admitted to nursing courses between fall 2004 to spring 2007. Not all students in the study had reported NET math scores. While NET reading scores were required for all students during the time period studied, the NET math score was not required until fall 2004. According to the Coordinator of Student Retention (personal communication, May 26, 2010), math scores before the fall 2004 requirement were reported using the *Descriptive Tests of Mathematics Skills in Arithmetic Skills* developed by the Educational Testing Service (ETS) in 1988. If the student received below a 77% on the ETS math test, the student was required to complete a nursing program generated “bridge course” as remediation. The math remediation course was pass or fail. If the student failed to achieve a passing score on the second ETS math test administered after remediation, the student was denied admission to the nursing program. Due to different progression through their freshmen and sophomore years, it was not until spring 2006 that all students entering the nursing program had the required NET math score rather than the ETS math score. The date the student was admitted as a freshman, or transfer student, determined the math requirement for admission, therefore, some students in semesters fall 2004 to spring 2006 did not have the reported NET math scores.

All students with reported NET math scores were included in the data collected to answer research question two. The NET test required 66% to be passed (raw score 40 out of 60). There were 151 cases with NET math scores available and 108 without NET math scores. In 2005, the students who failed the NET math test were required to enroll in a university remedial course for math in which they had to receive a grade of “B” or better the first time it was taken. Failing to meet this requirement resulted in dismissal of the student from the nursing program. Of the 151 reported NET math scores, 69 students

attained a score of 66% or above; 82 students scored below a 66% and required the math remediation. Table 4 presents mean math scores in each group included in this study.

Table 4

NET Math Scores for Native and CCT Students

	N	Mean	Std. Deviation
Native persisters	24	74.29	13.74
CCT persisters	47	75.49	14.00
Native nonpersisters	23	67.57	13.35
CCT nonpersisters	57	64.29	16.20

To answer research question two, four t-tests were performed. The first independent samples t-test was conducted to determine whether there is a significant difference at alpha .05 in the NET math scores between native graduates (persisters) and CCT graduates (persisters) in the nursing program (Table 5). The native persisters group mean was 74.29, and the CCT persisters group mean was 75.49, resulting in a mean difference of 1.20. The Levene's Test is not significant, so the t value for equal variances assumed is reported. The t-test was not significant, $t(69) = -34, p = .73$. There is no

significant difference in the NET math scores for native graduates (persisters) and CCT graduates (persisters).

Table 5

Independent Samples t-test for Math Scores Between Native and CCT Persisters

	<u>Levene's Test</u>		<u>t-test for Equality of Means</u>			
	F	Sig	t	df	Sig (2-Tailed)	Mean Diff
Math score	.027	.869	-.343	69	.733	-1.198

An independent samples t-test was conducted to evaluate if there is a significant difference at alpha .05 in the NET math scores between native nongraduates (nonpersisters) and CCT nongraduates (nonpersisters) in the nursing program (Table 6). The native nonpersisters group mean was 67.56, and the native CCT nonpersisters group mean was 64.30, resulting in a mean difference of 3.27. The Levene's Test is not significant at $p = .17$, the t value for equal variances assumed is reported. The t-test was not significant, $t(78) = .86, p = .39$. There is no significant difference in the NET math scores for native nongraduates (nonpersisters) and CCT nongraduates (nonpersisters).

Table 6

Independent Samples t-test for Math Scores Between Native and CCT Nonpersisters

	<u>Levene's Test</u>		<u>t-test for Equality of Means</u>			
	F	Sig	t	df	Sig (2-Tailed)	Mean Diff
Math score	1.940	.168	.856	78	.395	3.2670

As indicated in Table 7, an independent samples t-test was conducted to evaluate if there is a significant difference at alpha .05 in the NET math scores between native graduates (persisters) and native nongraduates (nonpersisters) in the nursing program (Table 7). The native persisters group mean was 74.29, and the native nonpersisters group mean was 67.56, resulting in a mean difference of 6.73. The Levene's Test is not significant at $p = .65$, the t value for equal variances assumed is reported. The t-test was not significant, $t(45) = 1.70$ $p = .10$. There is no significant difference in the NET math scores for native graduates (persisters) and native nongraduates (nonpersisters).

Table 7

Independent Samples t-test for Math Scores Between Native Persisters and Native Nonpersisters

	<u>Levene's Test</u>		<u>t-test for Equality of Means</u>			
	F	Sig	t	df	Sig (2-Tailed)	Mean Diff
Math score	.204	.653	1.701	45	.096	6.7264

An independent samples t-test was conducted to evaluate if there is a significant difference at alpha .05 in the NET math scores between CCT graduates (persisters) and CCT nongraduates (nonpersisters) in the nursing program (Table 8). The CCT persisters group mean was 75.49, and the CCT nonpersisters group mean was 64.30, resulting in a mean difference of 11.19. The Levene's Test is not significant at $p = .18$, the t value for equal variances assumed is reported. The t-test was significant, $t(102) = 3.73$, $p < .00$. It is concluded that there is a significant difference at alpha .05 between the two groups, CCT graduates (persisters) and CCT nongraduates (nonpersisters). For this comparison, persisters' math scores were significantly higher than the nonpersisters.

Table 8

Independent Samples t-test for Math Scores Between CCT Persisters and CCT Nonpersisters

	<u>Levene's Test</u>		<u>t-test for Equality of Means</u>			
	F	Sig	t	df	Sig (2-Tailed)	Mean Diff
Math score	1.852	.177	3.726	102	.000	11.1911

The t-test analysis found that for the NET math scores reported in this study, the only statistically significant difference at alpha level .05 in math scores that affected persistence was between CCT persisters and CCT nonpersisters. There was no statistically significant difference noted between native persisters and native nonpersisters, native nonpersisters and CCT nonpersisters, or native persisters to CCT persisters.

Research Question Three

The third research question asks whether or not there is a significant difference at alpha level .05 in the reading scores as reported on the NET for students admitted to nursing courses between fall 2001 to spring 2007. Every student admitted during this time period had to successfully pass the NET reading test with a score of 55% (raw score of 18 out of 33) or greater. Failure to meet this standard meant the student must enroll in a university remedial reading course and receive a "B" or better as a requirement for admission to the nursing program. Failure to meet this requirement meant that the student

was dropped from the nursing major and, therefore, unable to enter any nursing courses.

Table 9 describes statistics for the reading scores included in this study.

Table 9

NET Reading Scores for Native and CCT Students

	N	Mean	Std. Deviation
Native persisters	47	66.34	8.98
CCT persisters	90	63.28	13.89
Native nonpersisters	34	59.23	15.88
CCT nonpersisters	88	58.43	13.84

An independent-samples t-test was conducted to evaluate if there is a significant difference at alpha .05 in the reading scores from the NET between native graduates (persisters) and CCT graduates (persisters) in the nursing program (Table 10). The native persisters group mean was 66.34, and the CCT persisters group mean was 63.28, resulting in a mean difference of 3.06. The Levene's Test is significant at $p = .01$, so the t value for equal variances not assumed is reported. The t-test was not significant, $t(128.8) = 1.56, p = .12$. There is no significant difference in reading scores between native graduates (persisters) and CCT graduates (persisters).

Table 10

*Independent Samples t-test for Reading Scores Between Native Persisters and CCT**Persisters*

	<u>Levene's Test</u>		<u>t-test for Equality of Means</u>			
	F	Sig	t	df	Sig (2-Tailed)	Mean Diff
Read score	6.589	.011	1.559	128.811	.121	3.0626

An independent-samples *t*-test was conducted to evaluate if there is a significant difference at alpha .05 in the reading scores from the NET between native nongraduates (nonpersisters) and CCT nongraduates (nonpersisters) in the nursing program (Table 11). The native nonpersisters group mean was 59.23, and the CCT nonpersisters group mean was 58.43, resulting in a mean difference of .80. The Levene's Test is not significant at $p = .16$, so the *t* value for equal variances assumed is reported. The *t*-test was not significant $t(120) = .28, p = .78$. It is concluded that there is no significant difference in reading scores between native nongraduates (nonpersisters) and CCT nongraduates (nonpersisters).

Table 11

Independent Sample t-test for Reading Scores Between Native Nonpersisters and CCT Nonpersisters

	<u>Levene's Test</u>		<u>t-test for Equality of Means</u>			
	F	Sig	t	df	Sig (2-Tailed)	Mean Diff
Read score	2.014	.158	.276	120	.783	.8035

An independent-samples t-test was conducted to evaluate if there is a significant difference at alpha .05 in the reading scores from the NET between native graduates (persisters) and native nongraduates (nonpersisters) in the nursing program at a private, liberal arts university (Table 12). The native persisters group mean was 66.34, and the native nonpersisters group mean was 59.23 resulting in a mean difference of 7.10. The Levene's Test is significant at $p = .000$, the t value for equal variances not assumed is reported. The t-test was significant, $t(48.19) = 2.35, p = .02$. The mean difference in reading scores is significant at alpha .05 in the reading scores from the NET between native graduates (persisters) and native nongraduates (nonpersisters) in the nursing program.

Table 12

Independent Samples t-test for Reading Scores Between Native Persisters and Native Nonpersisters

	<u>Levene's Test</u>		<u>t-test for Equality of Means</u>			
	F	Sig	t	df	Sig (2-Tailed)	Mean Diff
Read score	17.441	.000	2.352	48.187	.023	7.1051

An independent-samples t-test was conducted to evaluate if there is a significant difference at alpha .05 in the reading scores from the NET between CCT graduates (persisters) and CCT nongraduates (nonpersisters) in the nursing program at a private, liberal arts university (Table 13). The CCT persisters group mean was 63.28, and the CCT nonpersisters group mean was 58.43, resulting in a mean difference of 4.85. The Levene's Test is not significant at $p = .82$, the t value for equal variances assumed is reported. The t-test was significant, $t(176) = 2.33$, $p = .02$. The mean difference in reading scores is significant at alpha .05 between CCT graduates (persisters) and CCT nongraduates (nonpersisters) in the nursing program.

Table 13

Independent Samples t-test for Reading Scores Between CCT Persisters and CCT Nonpersisters

	<u>Levene's Test</u>		<u>t-test for Equality of Means</u>			
	F	Sig	t	df	Sig (2-Tailed)	Mean Diff
Read score	.048	.826	2.332	176	.021	4.8460

Summary

No significant difference was found at alpha level .05 in the percentage of native students compared to community college transfer students who persisted to graduation. Community college transfer students in this study were as successful as native students in their ability to graduate from the nursing program studied.

For the NET math scores reported in this study, t-test analysis found a statistically significant difference at alpha level .05 in math scores that affected persistence to graduation between CCT persisters and CCT nonpersisters, but not between native persisters and native nonpersisters, native nonpersisters and CCT nonpersisters, or native persisters to CCT persisters. A similar comparison between groups and NET reading scores reported in this study found that there was a statistically significant difference at alpha level .05 affecting persistence in CCT persisters and CCT nonpersisters, as well as

native persisters and native nonpersisters, but not between native nonpersisters and CCT nonpersisters or native persisters to CCT persisters.

This study found that community college transfer students' ability to persist to graduation in a baccalaureate nursing program was related to the math score they received on the NET. This was not true for the native students. The study found the students' ability to persist to graduation in a baccalaureate nursing program was related to their reading scores in both native and CCT groups. Chapter V will summarize and correlate the results reported in Chapter IV to present relevant professional literature, draw conclusions, identify implications for actions and make recommendations for further research.

CHAPTER V: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter will summarize the entire study, including the methodology and findings, connect the findings of the study to the professional literature, make recommendations to practitioners and institutional leaders, recommend additional research involving nursing program retention efforts, and provide the conclusion of this investigation. The focus of the current study is an examination of the persistence of nursing students in a baccalaureate nursing program at a private, Catholic, liberal arts university as one avenue to address the projections of a record shortage of registered nurses. Unlike nursing shortages in the past, this shortage will be unique based on a triad of issues. First, there is presently an aging nursing workforce, without an adequate number of replacements (Slatterly, 2004). Secondly, there is an increasing population of patients who, due to increased medical technology, are expected to live well into their 90s needing care for the chronic conditions of old age (Buerhaus, Staiger, & Auerbach, 2009a). Finally, nursing education is soon to be threatened by a group of aging faculty nearing retirement age, again with few replacements in sight, and limited classroom space as well as disappearing clinical practicum sites where students learn how to care for patients (Buerhaus, et al., 2009a; Kuhlen, 2007; NLN, 2005).

Summary of the Study

Nursing shortages and the predictions of severe caregiver shortages in the past, often led to an increase in students who enter nursing programs, graduate, and fill the ranks of the nursing workforce that have diminished. The population groups most in need of health care have also, waxed and waned preventing serious consequences often

associated with decreasing numbers of registered nurses in the hospitals. Today, the United States healthcare system is bracing to care for the largest older adult population in its history, and it will need to do that with decreasing numbers of registered nurses (Buerhaus et al., 2009a). After World War II in the United States, a population explosion took place, known today as the “Baby Boomers,” as soldiers returned home from the war, and the United States entered a period of rapid population and economic growth. In 2011, this population born between 1946 and 1960 will begin to reach retirement age (Buerhaus, et al., 2009a). Medical technological advances promise to enable this 65 years of age and older cohort to live well into their 90s. The cost for this longevity will be in the management of chronic illnesses due to the aging process that will accompany these medical advances. The present and predicted numbers of registered nurses available to meet these needs is inadequate.

A slowed economy, such as seen in the past few years, can produce a false sense of hope that a nursing shortage will not be as severe as expected. Without health insurance, hospital patient census is lower as elective medical services are postponed. Hospital vacancies for registered nurses have been filled by stay-at-home mothers who have returned to the nursing workforce as their spouses are laid off (Buerhaus, et al., 2009b; Carlson, 2009). Economic uncertainty and stock market losses have prevented many registered nurses from taking a planned retirement. Additionally, the unemployed and the uninsured are foregoing preventive health care services, such as cancer screenings and regular physical checkups that in a few years will result in a larger population of critically ill patients, many of those, under 65 years of age demanding care

(Hadley & Waidmann, 2006). As the economy improves, increased nursing vacancies will return as the temporary influx of nurses into the hospitals decreases.

On March 23, 2010, the *Patient Protection and Affordable Care Act* was signed into law by President Barack Obama. The goal of this legislation is to extend affordable health care to all Americans in need of health insurance (The White House, 2010). It is uncertain how these health care changes, once implemented, will affect the nursing shortage. One suggested consequence is that as more people can afford health insurance, there will be a greater need for an increased registered nurse work force that if not available will increase nurse-to-patient ratios in the hospital setting. Researchers have increasingly found there are patient safety issues that surface with increased nurse-to-patient ratios. Aiken, Clarke, Sloan, Sochalski, and Silber (2002) found that just adding two patients to a nurse's workload increases the chances of patient mortality by 14%, and increases the number of patient falls, pressure ulcers, length of stay and infection rate in the patients cared for (Seago, 2001).

This study discovered each year some 147,000 applicants to nursing programs are turned away due to lack of space. Nursing programs are experiencing diminished numbers of qualified faculty, as well as decreasing hospital clinical sites where students practice (NLN, 2005). At the same time research found many nursing programs suffer from attrition rates ranging from 30% to 40% (Campbell & Dickson, 1996; Newton, 2008; Peter, 2005; Rotenberg & Bergman, 1997). Due to this retention problem, valuable student placements go unfilled. Identification of admission factors favoring retention can help refine the admission process for nursing students, increasing the probability that once admitted the student will graduate, pass the National Council Licensure

Examination for Registered Nurses (NCLEX-RN) examination, and become part of the nursing work force.

The retention of students in postsecondary education has been a fertile research field for educational theorists trying to explain the attrition rates of students enrolled in some colleges and universities. Despite the research over the past 60 years, the average retention rate in higher education continues to be approximately 50% in many colleges and universities (Bean, 1980; Seidman, 2005). Within the past 20 years, the landscape has changed on college campuses from that of the traditional student, who enters college following high school graduation, more than likely resides on the college campus, and immerses themselves in the college community. Today's campus is also inhabited by the nontraditional student who tends to be older (25 years of age and older), a commuter student, and may also be involved in raising or supporting a family (Bean & Metzner, 1985; Braxton & Hirschy, 2005; Gibson & Slate, 2010).

These nontraditional students often start at community colleges and then transfer to four year colleges and universities. Some studies have found that students who started at a community college were less likely to transfer to a university and be successful until graduation (Cohen & Brawer, 2003). This current study has taken a closer look at a group of those students who transfer from a community college to a four year private, Catholic, liberal arts university and enter into nursing courses alongside native students who began nursing courses at the same time. It examines whether community college transfer students who transfer into a private, Catholic, liberal arts university college of nursing are as successful as the native students from that same university. The nursing program chosen for this study is part of a private, Catholic, liberal arts university in the

Midwestern United States. In this study, approximately two-thirds of the student population admitted into the nursing program were community college students transferred seeking admission into the nursing program. Some faculty, at this institution, expressed concern that the quality of the community college students was responsible for the increased attrition rates. But was this true? Did community college transfer students graduate at the same rate as native students? Also, were preadmission math and reading scores on standardized tests related to persistence to graduation in these groups of students

Research has revealed that nursing programs use various combinations of preadmission test variables and student characteristics to select candidates who are most likely to be successful in the nursing program (Jeffreys, 2004). Based on research conducted in the area of nursing program retention, she developed the Nursing Undergraduate Retention and Success (NURS) model. Jeffreys (2004) posited that a number of student characteristics and academic factors interacted to increase the chances of success in a program of nursing. It was decided that this study would center on several of these student characteristics and academic factors and their impact on nursing program success and persistence. Standardized testing is used by many nursing programs to select the candidates most likely to graduate. Scores in reading and math on standardized tests were often targeted as indicators that would predict academic retention (Belcher, 1989; Ukpabi, 2008).

The purpose of this study was to conduct a preliminary investigation to identify predictor variables that are related to persistence of students in a baccalaureate nursing program at a mid-sized, private, Midwestern, Catholic, liberal arts university. This study

compared success rates, as determined by retention to graduation, of community college transfer students to native students in a registered nursing program at a mid-sized, private, Midwestern, Catholic, liberal arts university. In addition to examining retention to graduation rates between the two groups, any association between math and reading scores on a standardized test as predictor variables possibly impacting success of the groups was studied. The research questions of this study were:

Research Questions

1. Is there a statistically significant difference at alpha level .05, in the percentage of native students compared to community college transfer students who are retained to graduation and students from each group who are not retained in the nursing program at a private, Catholic, liberal arts university admitted into nursing courses from fall 2001 to spring 2007?
2. Is there a statistically significant difference at alpha level .05, in the math scores, as reported on the Nursing Entrance Test (NET), for students admitted to nursing courses from fall 2004 to spring 2007, of native students compared to community college transfer students who are retained to graduation and students from each group who are not retained in the nursing program at a private, Catholic, liberal arts university?
3. Is there a statistically significant difference at alpha level .05, in the reading scores, as reported on the Nursing Entrance Test (NET), for students admitted to nursing courses from fall 2001 to spring 2007, of native students compared to community college transfer students who are retained to graduation and students

from each group who are not retained in the nursing program at a private, Catholic, liberal arts university?

This study utilized an ex post facto or causal comparative design. This methodology requires the researcher to collect previously recorded data on the population of choice and then analyze that data to determine differences between the groups that may be statistically significant. In this study, data taken from both native students' and community college transfer students' records documented whether the student persisted to graduation or did not persist to graduation. The persistence rates of these two student groups were then compared and tested for any statistically significant difference. Test scores on a standardized math and reading test used for preadmission to a nursing program were collected and analyzed to determine if there were statistically significant differences in the mean scores of the two groups: native and community college transfer students.

The population studied included all native students and community college transfer students meeting predetermined criteria for inclusion in the study from fall 2001 to spring 2007. The setting is a mid-sized, private, Midwestern, Catholic, liberal arts university that houses the college of nursing. The students who were eligible for the study were native students who by definition began as freshmen at the university in this study, and transferred in less than six hours of credits and remain at the college of nursing until they graduate. Community college transfer students by definition were students who transferred into the university in this study from a community college with greater than

six hours of community college credits and remain at the college of nursing until they graduate.

A standardized Nursing Entrance Test (NET), administered to the students prior to their first university course, was used to assess the students' math skills and reading ability. The college of nursing had set the passing score for the math test at 66% and 55% for the reading test. Students who failed to meet this standard were mandated to take a university remediation course, in reading and/or math that they were required to pass with no less than a "B" to continue in the nursing program. Not meeting this standard prevented the student from continuing on as a nursing major.

To answer research question number 1, the chi-square statistical test was used to determine if there was a statistical significance between the observed frequencies of native students who persisted to graduation with the observed frequencies of community college transfer students who persisted to graduation. Research questions two and three are related to whether or not there was a significant difference in math and/or reading scores for those students retained to graduation from each group to those students who were not retained to graduation in the nursing program. To determine if any differences in these groups were statistically significant, t-tests were conducted.

Summary of Major Findings

The first research question examined whether there was a statistically significant difference at alpha level .05 in the percentage of native students compared to community college transfer students who are retained to graduation and students from each group who are not retained in the nursing program at a private, Catholic, liberal arts university admitted into nursing courses from fall 2001 to spring 2007. The data revealed that 48 of

the native students (58.5%) persisted to graduation, while the remaining 34 of the native students (41.5%) did not persist. A total of 88 community college transfers students (49.7%) persisted to graduation while the remaining 89 of the community college students (50.3%) did not persist. A chi-square test for independence was used to determine statistical significance between the observed frequencies of native students who persisted to graduation to the observed frequencies of community college transfer students who persisted. The percentage of native students that persisted to graduation was 8.8% greater than the percentage of community college transfer students that persisted to graduation. The results of this analysis found that the difference between the 58.5% of native students who persisted to graduation to the 49.7% of community college transfer students who persisted was not statistically significant.

The second research question examined whether or not there is a significant difference at alpha level .05 in the math scores as reported on the NET for students admitted to nursing courses between fall 2004 and spring 2007. The results of these t-tests found that there was no statistically significant difference at alpha .05 in the NET math scores between native and community college transfer graduates. A statistically significant difference at alpha level .05 was found in the math scores between the two groups of community college transfer students who graduated and with the community college transfer students who did not graduate.

The third research question asks whether or not there is a significant difference at alpha level .05 in the reading scores as reported on the NET for students admitted to nursing courses between fall 2001 and spring 2007. The results of these t-tests found that there was no statistically significant difference at alpha .05 in the NET reading scores

between native graduates and community college transfer graduates and between native and community college transfer students who did not graduate. A statistically significant difference at the alpha level .05 was found in the reading scores between native graduates and native students who did not graduate, as well as between the mean reading scores of community college transfer graduates and community college transfer students who did not graduate in the program studied. This statistical significance between both native graduates and those who did not graduate, as well as between community college transfer graduates and community college transfer students who did not graduate indicate that persistence was related to reading scores but not to student category.

Persistence of Community College Transfer Students

The first research question examined whether there was a statistically significant difference at alpha level .05 in the percentage of native students compared to community college transfer students who are retained to graduation, and students from each group who are not retained in the nursing program at a private, Catholic, liberal arts university admitted into nursing courses from fall 2001 to spring 2007. The first group is identified as native students who began as freshmen at the university studied and who transferred in less than six hours of credits (none of which can be sciences) and remain at the college of nursing until they graduate. Community college transfer students are defined as students who transfer into a baccalaureate nursing program, alongside native students, from a community college with greater than six credits of study at the community college. Jeffreys (2004) in the Nursing Undergraduate Retention and Success (NURS) model identified various factors that can affect persistence to graduation. The inclusion of student characteristics in Jeffreys' (2004) framework provided a basis for identification

of at-risk students. Two of those factors, age and cumulative grade point averages in these two groups, will be investigated for any possible connection to persistence in graduation in the nursing program studied..

Between fall 2001 and spring 2007, the college of nursing at the university studied admitted 82 native students or 31.66 % of the selected population and 177 community college transfer students or 68.34% of the selected population. Each group, of native students and community college transfer students, was divided into age categories of “younger than 25” and “25 and over.” Nontraditional students were defined by Bean and Metzner (1985) as being older than 24, while traditional students were 24 and younger. Initially, many community colleges aggressively recruited these non-traditional students by offering them flexible class schedules located in their community (Cohen and Brawer, 2008). However, in the past two decades the age delineation between these two groups has disappeared as “over 24” year old students have begun to populate both two and four-year campuses (Gibson & Slate, 2010). In this study, the native student population was overwhelmingly in the “younger than 25” category with 98.8% of the sample in that age group. The community college transfer students were more diverse claiming 68.9% of the “younger than 25” group and 31.1% of the “25 and older” group. In the “25 and older” group of community college transfer students, 24 persisted and 31 did not.

Previous studies have shown that the traditional student at a four year university is typically enrolled in a four year residential university or college following graduation from high school (Berger & Lyon, 2005). The theories developed about the retention of these students focused on the student (age 18 to 24) becoming interconnected with the

higher education environment through immersion. Retention was dependent on the students' ability to break away from previous associations and grounding themselves in the college community. Their main task was to gain an education while having few environmental distractions, such as work or family responsibilities (Braxton & Hirschy, 2005; Berger & Lyon, 2005). Bean and Metzner's (1985) student retention research began to focus on a unique type of student who began to populate college campuses in the early 1980s. The nontraditional student was older, did not reside on campus, and most importantly, had responsibilities other than that of a student.

Jeffreys's (2004) research identified age as a possible barrier to persistence; however the research on age and persistence is mixed. She cites studies that found the older student did not perform as well in an educational setting, was unable to find needed support services, was less likely to integrate well into the college community, and often was hindered by outside variables (Mancuso, 2001). She also identifies research that found older students, especially if their number was well-represented in a class, actually enhanced learning (Lynch & Bishop-Clark, 1998). Manifold & Rambur (2001) found in their study of American Indian nursing students, that age was related to increased retention. Van Rooyen, Dixon, Dixon and Wells (2006) discovered that older students actually performed better than younger students in a nursing program. Murtaugh, Burns, and Schuster's (1999) study found that while the older student (25 and over) had higher graduation rates this was only accomplished when the university addressed the older students needs such as flexibility in scheduling classes in the evenings or weekends. Jeffreys (2004) concludes that educators should look at each student as being unique, rather than part of a group labeled "young" and "old".

The present study found that persisters were more likely to be younger than nonpersisters. Native students tended to be younger than their community college transfer students counterparts. This information correlates with a 2003 national survey of nursing students conducted by the Johnson and Johnson Company in an effort to evaluate the company's campaign for promotion of nursing as a career (Norman, Buerhaus, Donelan, McCloskey, & Dittus, 2005). This survey revealed that the average age of nursing students in all programs was 26 years of age, with 76% between the ages of 18 and 30 years. Community college associate degree nursing programs were found to attract students who were on average six years older than those enrolled in a baccalaureate nursing program. The same study also discovered that students 25 years of age and younger were less likely to be married (12%), and only a small percentage had children (10%) (Norman, Buerhaus, Donelan, McCloskey, & Dittus, 2005).

At the institution in this study the native students were overwhelmingly 98.8% younger than the age of 25. The community college transfer students in this study, which should have had a predominance of students older than the age of 25 but had 68.9% under the 25 years of age, did not fit the Bean and Metzner (1985) model. Perhaps the community college transfer students entering the institution in this study were more like the native students than the typical community college transfer student accounting for the lack of significant differences between the retention rates of the two groups. The community college transfer student group studied was composed of 68.9% of students under the age of 25. In both groups, their persistence was inversely related to age. That is the older the student the less likely they were to persist. One explanation for this occurrence may be connected to previous research by Murtaugh, Burns, and Schuster

(1999) who found that an absence of flexibility in scheduling of classes inhibited the success of the older student. The classes in the nursing program studied were almost exclusively held during the day on Monday through Friday. Further research is needed on these two groups regarding whether they were residential or commuter students, married and not married, with or without children, and hours worked outside of the college per week. Comparison to other universities would be advised to determine whether or not the fact that the young age of native students at this university was the norm for similar type institution.

Student grade point averages were also collected for each group of persisters and nonpersisters to identify the possibility of “transfer shock” and its effect on persistence in the native and transfer groups. For all students, the end of the first semester cumulative grade point average (GPA) was lower than that of their admittance cumulative GPA. The largest drop was .44 in the community college transfer students who did not persist. The smallest drop was .05 in the native students who did persist. The native nonpersisters experienced a .14 drop and the community college transfer persisters a .25 drop. The drop for community college transfer students was greater for both those who persisted and those who did not, possibly speaking to the issue of transfer shock. Native students’ cumulative GPA did drop but not to the same degree. Neither group was ever able to meet or exceed their admittance cumulative GPA at the time of graduation from the nursing program.

The adjustment of transfer from a community college to a four-year nursing program involves not only academic demands but social and psychological adjustments, as well (Jeffreys, 2004). The transfer shock experienced by community college transfer

students may affect the students' academic standing. In a nursing program, a "D" in a course will prevent that student from moving forward, as they need to repeat that course before moving to the next level of studies. A second "D" or "F," and the student will be dismissed from the nursing program preventing that student from regaining the lost GPA points in the next semester (Newton, 2008). Newton, Smith, and Moore (2007) found in their study that all transfer students admitted to nursing courses in the winter semester had higher attrition rates than those admitted in the fall semester. Upon closer study it was determined that many of the winter admissions were students who had to repeat prerequisite courses, resulting in greater attrition for the winter cohorts. These students were also more likely to have at least one "C" grade, even though their cumulative GPA was 3.0 or higher (Newton, Smith, & Moore, 2007).

Hills (1965) initially defined the drop in grade point average, between .30 and .50, experienced by community college students in their first semester in a four-year university as "transfer shock". Using a retrospective approach looking at more than 20 studies on students, Hills (1965) came to the conclusion that some degree of transfer shock, defined as a drop in GPA in the first semester post transfer, was felt by more than 90% of those studied. He also found that less than 10% failed to recover to some degree after the first semester. Ishtani (2008) purported that a decrease in GPA or "transfer shock" significantly reduces the chances of that student's reenrollment in a subsequent semester. Native students may experience a similar decrease in GPA as they begin courses in their major, however after this decrease the native students persisted at a higher rate than the transfer students (Ishtani, 2008). Rhine, Milligan and Nelson (2000)

expand on the suggestion by Laanan (1996) to provide student support services for the community college transfer student to alleviate possible “transfer shock”.

The findings in the current study correlate with research describing transfer shock as a real entity for many students. Native students who did not persist entered nursing courses with a cumulative GPA of 3.10. Community college transfer students who did not persist entered nursing courses with a similar cumulative GPA of 3.12. The average cumulative GPA's reported at the end of the first semester of nursing courses fell to 2.96 for natives (nonpersisters) and 2.68 for community college transfer students (nonpersisters). The difference in cumulative GPA for the community college transfer students, most likely due to transfer shock, was .44 compared to their native peers who only lost .14 of their cumulative GPA. In the nursing program at the center of this study, if students receive an “F” in one nursing course, or two “Ds” in nursing courses, and their cumulative GPA falls below 2.75, they are dismissed from the nursing program. The student must then sit out of nursing courses as they attempt to increase their cumulative GPA to the required 2.75 before they can apply for readmission. Jeffreys (2004) stated that while strict retention policies are appropriate, they often lead to increased attrition. The students who persisted graduated with a cumulative GPA of 3.19 for native students and a 3.0 for community college transfer students. An elevated attrition rate in the first semester after transfer, due to transfer shock, may prevent the student from remaining in the nursing program. The research supports that student age and cumulative GPA indicating the possibility of transfer shock, are factors that affect persistence of students in this study.

To answer research question one, a chi-square test for independence was used to determine statistical significance between the observed frequencies of native students who persisted to graduation to the observed frequencies of community college transfer students who persisted to graduation. The data revealed that 48 of the native students (58.5%) persisted to graduation, while the remaining 34 of the native students (41.5%) did not persist. A total of 88 community college transfers students (49.7%) persisted to graduation while the remaining 89 of the community college students (50.3%) did not persist. The observed frequency of native students that persisted to graduation was 8.8% greater than the observed frequencies of community college transfer students. The results of this analysis found that the difference between the 58.5% of native students who persisted to graduation to the 49.7% of community college transfer students who persisted was not statistically significant.

Berger and Lyons (2005) contend William Spady's 1970s research led the way for such theorists as Tinto to build a body of knowledge concerning why students are not retained. Forty years later reports from American College Testing (2010) found that in 2009 almost 39.7% of freshmen students at a four year private college using liberal admission selectivity do not reenroll for the second year. The numbers at highly selective institutions hover near 6.4%, while less selective institutions may report a freshman to sophomore attrition rate as high as 34.5%. Community colleges often see this rate soar to near 50% (American College Testing, 2010; Berger & Lyon, 2005). High attrition rates for the rigorous nursing curriculum are well documented in the literature (Byrd, Garza, & Nieswiadomy, 1999; Spahr, 1995).

Retention studies of the general population of non nursing community college transfer students contends that community college transfer students are more likely to drop out when compared to native students who start at the same university as freshmen. The literature strongly supports the premise that most students who begin at a community college are less likely to obtain a bachelor's degree (Anglin, Davis, & Mooradian, 1995; Bowen, Chingos, & McPherson, 2009; Doyle, 2009; Hagedorn, Moon, Cypers, Maxwell, & Lester, 2006). Alfonso (2006) found that beginning at a community college will decrease students' chances by 21% to 33% to attain a baccalaureate degree. Alfonso (2006) reminds the reader to take into consideration that the community college transfer student may be more likely to "stop out" for some time or to attend on a part-time basis, increasing the time to graduation to as high as eight years. Dougherty's (1992) study matched native and community college students and found that community college students were still 11% to 19% less likely to graduate with a baccalaureate degree.

The current study concurred with Falconetti (2009) who found that there was no statistically significant difference between the two groups, even though the transfer students had a greater rate of drop out prior to graduation in the general non nursing transfer population, when compared academically by final GPAs. Johnson (2005) reports the same conclusion, attributing these findings to a smaller class size and/or the isolated environment of the campus studied. Lee and Marks (1993) found in their study that the probability of obtaining a bachelor's degree was the same for both groups. Their research found that not all community college students are at a disadvantage due to their choice of where they chose to start their education. Most successful is the student who could have gone onto a four-year college after high school, but chose the less expensive community

college route. Students who actually transfer and graduate may be more determined to succeed than community college students who enter the college with the goal of obtaining a bachelor's degree (Lee & Marks, 1993). Community college transfer students who have a direct goal in mind, such as majoring in a specific area, may possess that determination (Lee, Mackie-Lewis & Marks, 1993; Piland, 1995). As previously stated, to date research on this subject has been centered on generic transfer students without looking at specific programs, such as nursing. Community college transfer students with an end goal in mind are often more determined to make the most of their time at a university and are less likely to drop courses or stop out for periods of time (Piland, 1995). Pascarella and Terenzini (2005) recent studies report that students who actually transfer from a two-year institution to a four-year institution have similar persistence rates of 76% transfer students to 78% native students. Pascarella and Terenzini (2005) relate that if similar students are identified as "low-risk" and more like the native student population that they will be assimilated into; it is more likely that they will persist to graduation. Another study found similar results when the community college transfer students transferred in more than 10 college credits (Adelman, 1999). Many of the students in the current study did transfer in more than 10 credits from the community college.

Math Scores as Related to Persistence

The second research question examined whether or not there is a significant difference at alpha level .05 in the math scores as reported on the NET for students admitted to nursing courses between fall 2004 and spring 2007. The results of these t-tests found that there was no statistically significant difference at alpha .05 in the NET

math scores between native and community college transfer graduates. A statistically significant difference at alpha level .05 was found in the math scores between the two groups of community college transfer students who graduated and with the community college transfer students who did not graduate. There was no statistically significant difference found between native persisters and native nonpersisters, native nonpersisters and community college transfer nonpersisters, or native persisters to community college transfer persisters. This significant difference between the community college transfer graduates and community college transfer students who did not graduate indicates community college transfer students with lower math scores were more likely to not graduate than their native counterparts based on their math scores.

Prior to the mid-1960s community colleges were populated by an overabundance of students qualified for a university, but who were unable to enroll in overcrowded universities. Once the college student population decreased and universities became more competitive for these well-prepared students, their numbers at the community college dropped (Cohen & Brawer, 2008). Cohen and Brawer (2008) indicated that in many community colleges, 40% to 50% of the admitted students are taking at least one remedial course. Wang (2009) found that the need for math remediation significantly decreased the chances of a community college transfer student obtaining a baccalaureate degree. Wang's (2009) research also suggested that math remediation may negatively affect the students' self-concept, making baccalaureate attainment less likely.

The range of the math scores, for all students in the university studied who had math scores recorded, were 34 to 98. Native persisters had a mean of 74.29, while community college transfer persisters had a mean of 75.93, native nonpersisters had a

mean of 67.56, and community college transfer nonpersisters had a mean of 60. Of the 57 community college transfer students who failed the NET math and passed remediation, 23 or 40.3% did not persist to graduation even after remediation. It is possible that, community college student transfers may have completed a remedial program for math with little increase in their math ability. It is suggested that community college transfer students' transcripts be evaluated for math remediation. If the community college transfer student has already completed math remediation and fails a preadmission math screening test, they are less likely to persist in a baccalaureate nursing program.

The literature supports the need for math skills in practicing registered nurses and the significant role math plays in retention has been well-documented (Abdur-Rahman, Femea, & Gaines, 1994; Ellis, 2006; Murray, Merriam, & Adams, 2008; Sayles, Shelton, & Powell, 2003). Newton, Smith, Moore, and Magnan (2007) reported math scores in the Test of Essential Academic Skills (TEAS), one of several nursing program preadmission tools, were able to predict first semester attrition. Abdur-Rahman, Femea, and Gaines (1994) found the Nursing Entrance Test (NET) math testing of graduating students, when compared to their incoming math scores, was significantly higher in the posttest. Another study found the preadmission score achieved on a standardized math test was significantly related to those students passing a medication calculation test given in a baccalaureate nursing program (Newton, Harris, Pittiglio, and Moore, 2009). The medication calculation test needed to be passed at the 90% level in order for the student to continue with nursing courses. Bliss-Holtz (1994) surmised that the mathematical skills needed in medication administration require arithmetic calculation skills as well as understanding mathematic concepts allowing the student to formulate correct proportions

for medication dosing. While a calculator can improve arithmetic skills, not understanding how to formulate correct proportions can and should prevent the student from moving forward with their nursing studies (Newton, Harris, Pittiglio & Moore, 2009).

Poezhl (1996) compared the math skills of nursing majors to the math skills of non nursing majors and found that the nursing majors were more likely to be deficient in math skills. Worrell and Hodson (1989) discovered that 83% of nursing programs reported difficulties with student nurses' math competencies. Blais and Bath (1992) revealed that only 11% of junior-level nurses were able to pass a math proficiency test at the 90% level. Blais and Bath (1992) suggested that students be remediated in word problems rather than computational skills. The remediation courses provided to the general university population were not specific to the type of computational skills needed by nursing students.

Boughan (1993), in a community college research study, was unable to find a relationship between math skills and persistence in a nursing program and the ability to pass the NCLEX-RN exam. Boughan's study also found that remediation of any skills (reading, math, or English) did not improve the likelihood of graduation and success on the NCLEX- RN exam. In this study 63 students, who had reported math scores, or 41.7% needed math remediation. Out of those who remediated and passed remediation with a "B" or better, 44 or 70% did not persist to graduation. In Belcher's (1989) study, 52% of the students entering into the nursing program were either in need of remediation in math or were considered marginal in their math ability. Many of the studies concerning math ability were in relation to preadmission math scores and success on the NCLEX-

RN exam rather than on persistence in the nursing program. However, for the college of nursing studied, between fall 2001 spring 2007, the average passing rate on the NCLEX-RN exam was 98%. With a passing rate this high, studies of persistence in the nursing program and passing the NCLEX –RN may be considered synonymous. These studies regarding NCLEX-RN exam success, many which were completed at associate degree nursing programs in a community college, found that there was a connection to success dependent on the higher math and reading skills (Higgins, 2005; Sayles, Shelton, & Powell, 2003). Crane, Wright, and Michael (1987) found that in the preadmission Health Education System Exam (HESI), math and reading scores are predictive of successful completion of a nursing program at the diploma level of nursing education. The HESI Admission Test, which is used as a preadmission test for nursing students, measures six academic areas, including math and reading skills.

Murray, Merriman, and Adamson (2008) found that the HESI exam was predictive of success in associate degree nursing programs as well as baccalaureate nursing programs that chose to use the exam for preadmission purposes. Ukpabi (2008) also found that preadmission scores on the ATI TEAS (Test of Essential Academic Skills) for math and reading were significantly related to success on the NCLEX-RN, signifying persistence to graduation. Future studies are recommended into the math remediation courses and programs available to nursing majors and how they impact the computational skills needed by the registered nurse.

Reading Scores and Persistence to Graduation

The third research question asks whether or not there is a significant difference at alpha level .05 in the reading scores as reported on the NET for students admitted to

nursing courses between fall 2001 and spring 2007. The results of these t-tests found that there was no statistically significant difference at alpha .05 in the NET reading scores between native graduates and community college transfer graduates and between native and community college transfer students who did not graduate. A statistically significant difference at the alpha level .05 was found in the reading scores between native graduates and native students who did not graduate, and community college transfer graduates, and community college transfer students who did not graduate in the program studied. T-tests revealed no significant difference between native persisters to community college transfer persisters or native nonpersisters to community college transfer nonpersisters. The findings of a statistically significant difference at alpha level .05 in both the native and community college transfer students indicate that higher scores in reading are related to persistence in native students as well as community college transfer students.

Recent literature on reading ability and its effect on retention in nursing programs is not well documented, and much of the research on reading ability available is more than 20 years old. Most recent studies on reading ability have been for students for whom English is a second language or in relation to NCLEX-RN scores rather than persistence in the nursing program. Nursing students need to be able to read and comprehend large amounts of difficult reading material to be successfully retained to graduation. Several studies point to the positive connection between reading ability and success in nursing programs in community colleges (Boughan, 1993; Donsky & Judge, 1981; Dean & Fischer, 1992).

Belcher (1989) found success rates in the first semester of nursing courses at the community college level were positively related to reading skills and repeats of

prerequisite science courses. Students with a deficiency in reading skills, even after remediation, received lower grades in nursing courses leading to attrition or at least increased length of time to graduation. Interesting in Belcher's study was that even students assessed as marginal in reading skills with no required remediation were less likely to persist to graduation than the remediation group. Most likely the cut off score for pretest reading scores was set too low, leaving these marginal students without the remediation necessary to succeed. The final results of Belcher's study revealed that students identified as having adequate reading skills were most likely to succeed. Of the students that needed remedial reading courses, only 65% were able to maintain a cumulative GPA of 2.0 or better. Gallagher, Bomba, and Crane (2001) determined that the reading score on the Registered Nurse Entrance Exam (RNEE) was significantly predictive of success in a community college nursing program.

The cognitive ability to read enables students to do more than accrue information. It allows them to critically think by having the capacity to create and organize thought patterns. These thought patterns will then lead to decision-making and the ability of the nurse to justify her actions in a particular situation, such as patient care (Allen, Bowers, and Dieklmann, 1989). For many nursing students today, English is a second language. For these students, cognitive academic language proficiency can only be acquired by years of reading academic texts (Abriam-Yago, Yoder, & Kataoka-Yahiro, 1999).

Lockie and Burke (1999) developed a retention program at their college of nursing for at-risk nursing students. The college compiled data that revealed students entering the nursing program were academically underprepared to meet the rigors of a nursing curriculum at the college level. One of the target areas in this program was

remediating reading skills of students admitted to the program. The overall results of the study found that at risk students enrolled in the program, when compared to a control group of at-risk students not exposed to the retention program, achieved a retention rate of 90.1%, while the control group retention rate was 56.2%.

Preadmission tests, such as the Nursing Entrance Test (NET), used by the college of nursing examined in the current study are used to document reading ability and the need for remediation, if necessary. Research has found that students who receive less than 55% on the NET reading comprehension score are at increased risk for attrition from a nursing program (Abdur-Rahman, Femea, & Gaines, 1994; Gallagher, Bomba, & Crane, 2001; Symes, Tart, Travis, & Toombs, 2002). Ethnic or race comparisons made by Crane, Wright, and Michael (1987) concluded that for White and Asian subsamples of a nursing student population, reading scores had a low predictive value for success. However, in regards to a Hispanic subsample reading scores were predictive of success in a nursing program. A positive correlation between the Assessment Technology Institute's (ATI) reading scores and success in a nursing program was found by Ukpabi (2008). As previously mentioned several studies found that both math and reading pre-admission scores were predictors of success in a nursing program (Crane, Wright, & Michael, 1987; Higgins, 2005; Murray, Merriman, & Adamson, 2008; Sayles, Shelton, & Powell, 2003).

Unexpected Findings

One unexpected finding was the makeup of the community college transfer students. It was expected that this population would be more like the nontraditional students as defined by Bean and Metzner (1985):

A nontraditional student is older than 24, or does not live in

a campus residence (e.g., is a commuter), or is a part-time student, or some combination of these three factors; is not greatly influenced by the social environment of the institution; and is chiefly concerned with the institution's academic offerings (especially courses, certification, and degrees). (p. 489)

In this study, the percentage of community college transfer students younger than 25 years of age was 68.9% and, therefore, not much older than their native counterparts. The community college transfer students also attended full time rather than part time while in the nursing program. It was not known whether these students tended to be campus residents or commuters. It would be of interest to include that in future studies. In the current study, the transfer population was not so different than their native counterparts, explaining why persistence was not significantly different in the group comparison between native and community college transfer students.

Limitations and Conclusions

One limitation identified is the narrow scope of this study. The ability to generalize these findings due to the nature of the study is limited. The choice of a Midwestern locale at a medium-sized, private, Catholic, liberal arts college makes generalization to a wider population difficult. It is hoped that this study opens the door to the study of nursing student retention in innovative venues, such as other private colleges or proprietary schools. Another limitation was the choice of a retrospective study. Such a study limits the researcher from going back and collecting more data on the participants that may affect the outcome of the study. It also limits the researchers control of the

variables used for differentiation. What is suggested is a longitudinal study of retention and necessary remediation and its effect on attrition.

Colleges of nursing are experiencing an aging faculty, limited clinical spaces for practicum and economic restraints on college growth. Thousands of qualified prospective nurses are turned away from nursing programs due to inadequate spaces, based on the above reasons, each year. At the same time, it is not unusual to see 30% to 40% of students admitted to these very programs not reach graduation. Most of these students attrite in their first year of nursing courses.

At the same time a renewed interest in higher education has been spurred on by statistics indicating that the United States had fallen to 10th-place in the world for the percentage of the population holding a college degree (Thomas, 2010). Funding has been approved specifically for grants seeking to find a solution to this retention issue. The community college system has been deemed as the entry point for increasing American numbers to attain those college degrees. It is likely four-year universities will see an increase in the number of community college transfers as well as community college graduates seeking enrollment for a baccalaureate degree for career or professional advancement.

The debate continues as to whether or not community college students who enter the higher education educational system by the community college route are hindered or helped in reaching a desired baccalaureate degree. This study found that the community college students in this study, who entered a four year private, Catholic, liberal arts university college of nursing alongside the ongoing enrolled native students, were as likely to graduate as their native peer group. This study also found the existence of an

almost 50% attrition rate for these two groups of students. It should be stated though that this study only compared native students to community college students, who made up 54% of the transfer students admitted in the time frame studied, while the remaining 46% of students had transferred in from other four year universities. Perhaps the addition of the students admitted from other than the community college transfer group would have shown success rates 20% to 30% higher. Future studies are recommended to include transfers from colleges other than community colleges.

This study has also added to the body of literature that the math and reading skills which students bring to higher education can, and does, have an impact on how well they do in a nursing program. While it was beyond the scope of this study, the effectiveness of remediation is certainly an area that deserves further study. Once pre nursing students are identified as deficient in skills, it is suggested that specific remediation be made available to prepare the students for the specialized math skills needed by registered nurses to administer medication safely. Most general math remediation programs focus on arithmetic skills. It has been suggested in this study that nursing students need the ability to read and interpret mathematical word problems. Students deficient in reading skills need to be guided and tutored not only in reading skills but in how to read large amounts of scientific material and be able to identify what is relevant to the topic being studied (Ukpabi, 2008).

The question of what can be done to increase the numbers of students graduating from American nursing programs is one that appears to have an elusive answer. The current study has addressed a gap in the retention literature studying whether or not

community college transfer students are as likely to graduate alongside their native peers in a four year baccalaureate nursing program in a private, Catholic, liberal arts university.

Implications for Actions and Recommendations for Practitioners

It has been estimated that 33,279 baccalaureate nursing applicants, 110,576 associate nursing degree applicants, and 3,614 diploma nursing applicants were refused admittance to a nursing program in 2005 (NLN, 2005). A primary reason for these refusals is limited nursing program capacity, complicated by an aging faculty work force and limited hospital practicum sites (Buerhaus, et al., 2009). At the same time, many of these nursing programs have reported 30% to 40% attrition rates of students who were placed in those programs in lieu of the applicants turned away. This study has attempted to add to the body of knowledge suggesting how to increase retention rates in nursing programs.

A decrease in the attrition rate of students admitted can be achieved by colleges and universities either by: (1) becoming more selective or (2) supporting the less prepared students who enter a program of nursing. Certainly the first solution, selectivity, can be practiced at some colleges in the nation. However, in the end this will ultimately decrease the nursing population and add to the present nursing shortage. The current study is unique, because it examines students transferring from a public community college to a private, Catholic, liberal arts university. The mission of private, Catholic, liberal arts universities, such as the institution studied, are to provide for students who meet the basic requirements of a nursing program for admissions, so they can be supported and retained. These institutions generally provide smaller classes favoring underprepared students. This lower faculty-to-student ratio fosters interaction that

supports student retention. This increased student-faculty involvement, as professed by Jeffreys (2004), can provide support for the students' self-esteem and self-worth. Nursing faculty in institutions, such as the one studied, are encouraged even challenged to make a difference in their students. For educators in four year colleges and universities, this current study has added to research that indicates community college transfer students can and do graduate alongside their native peers.

In the coming years, American colleges and universities will most likely see an increase of community college transfer students because of the escalating cost of college. Therefore, it is time for increased collaboration between leaders of community colleges and all four year institutions. Every semester hundreds of students are turned away from community college nursing degree programs. Seamless transfer for these nursing students at all four-year colleges and universities can and must be fostered. One suggestion would be the development and promotion of an associate degree for pre-nursing students consisting of prerequisites that can then be transferred to the chosen four-year institution. The community college student would then transfer for the last two years to the four-year institution and receive a baccalaureate degree in nursing. Offering these students a degree that can be transferred benefits the community college, which awards an associate degree, the student whose costs of education would be significantly decreased, and the private, Catholic, liberal arts university which awards the baccalaureate degree.

During these first two years of study at the community college, students in a degree program defined as pre nursing would be remediated in math and reading skills needed specifically for nurses. The result would be students entering a nursing program better prepared in these skills. This study has shown that community college transfer

students' math ability may inhibit persistence at a four year college or private, Catholic, liberal arts university, for at least the group studied. Reading ability was deemed significant for retention in both groups studied. As noted previously, retention also is a problem in many associate degree nursing programs. Specifically developed remediation programs for nurses in math and reading would also benefit those students entering the community college planning on attaining an associate degree in nursing. While this study uncovered the importance of reading and math skills in retaining students in a nursing program, other studies have uncovered sociological, environmental, and psychological variables affecting the retention of students in a nursing program (Belcher, 1989; Cameron, 2005; Jeffreys, 2004). Nurse educators need to continue research into these factors to increase retention rates in nursing programs.

For such an association, between community colleges and university programs to succeed, both institutions must work collaboratively for the benefit of the students. In the state of Illinois, a statewide articulation agreement already exists allowing transfer of the completed Illinois transferable General Education Core Curriculum between participating public and private colleges and universities. Participation is purely voluntary on the part of the cooperating institutions. Completion of the General Education Core Curriculum assures transferring students that lower-division general education requirements for an associate's or bachelor's degree have been satisfied (Illinois Articulation Initiative, 2010). In nursing, many colleges have "2 + 2 agreements" which enable a student with an associate degree in nursing to transfer as seamlessly as possible into a program where they may earn their baccalaureate degree. The mandate is that these institutions create a

similar program allowing students to complete their first two years at a community college and then transfer for the last two years to four year university.

This current study added to the evidence that math and reading skills do have an impact on student success in postsecondary education concerning whether students persist. It is important that higher education leaders develop remediation programs to strengthen foundational math and reading skills of all students. At the grade school level, students interested in health sciences such as nursing, need to be exposed to the rigor that will be expected of them in a nursing program. High schools and community colleges have developed dual-enrollment and early college education programs. One such partnership already exists near the private, Catholic, liberal arts university in this study. This community college has partnered with local high school districts to allow high school students to take courses on their own high school campus and simultaneously receive college credit. Presently it prepares high school students interested in eight career paths such as child care, information and networking technology, and digital design and animation. Nursing could be added as a career path including courses in math and scientific reading as preparation for nursing. Prerequisite courses needed for nursing programs could also be taken as advanced placement credit, enabling community college students to accrue credits necessary to complete the associate degree for nursing program or for transfer to a baccalaureate nursing program. Length of time to graduation is an important variable in retention to graduation. A delay in the date of graduation will increase the likelihood of attrition over time (Pascarella & Terenzini, 2005).

The United States government, as well as private enterprises such as Johnson and Johnson, need to continue to provide grant funding for colleges of nursing to develop

retention programs. Presently the Health Resources and Service Administration (HRSA) provides competitive grant funding to registered nurse education programs to increase retention of nursing students in their programs. Grant money can also finance development of collaborative programs between community colleges and four year institutions. One such grant funded collaboration between the University of Nebraska at Omaha (UNO) and a local community college to increase the number of associate as well as baccalaureate degrees awarded in the areas of science, technology, engineering and mathematics (Hesham, Heidel, O'Connor & Richter-Egger, 2004).

Recommendations for Further Research

This study filled a gap in the literature examining success rates of nursing students in a mid-sized, private, Midwestern, Catholic, liberal arts university. The study was limited by setting and population, therefore generalization to all nursing students cannot be made. It is suggested that to control for power, this study be replicated using a stratified random sample. The size of the population needs to be increased. Additionally, an experimental design instead of an ex post facto design would allow the researcher to manipulate variables or explore variables that cannot be controlled in a retrospective study. This study only investigated the specific academic variables of reading and math and its relationship to retention. While remediation was required for those nursing students with low math and reading scores, was the remediation beneficial? A future study could examine whether or not the remediation enabled students deficient in math and reading skills to persist to graduation. Two other areas of research interest are science abilities and students' patterns of attendance. The professional literature identified a connection between science ability and retention that can be explored. There also seems

to be a connection to a pattern of withdrawals from prerequisite classes for the community college transfer student as they tend, more so than the native student, to stop out for periods of time. Research identified a psychosocial or sociological issue causing this behavior and its effect on retention (Jeffreys, 2004). The review of the literature presents evaluation of retention programs that have been developed and implemented in nursing programs. This area of research needs to be expanded to address the increasing numbers of underprepared students entering the higher education system. The community college students who transferred to the college of nursing in this study were not representative of the “nontraditional” community college student in regards to age. Future research can be conducted to further examine the data in an attempt to uncover differences that may have affected graduation rates of these two groups of native and community college transfer students. Qualitative research could identify the intentions of the community college students who transferred to the university in this current study, including whether their initial purpose was to complete two years at the community college and transfer, or did they transfer when they were denied admission to the community college program of nursing? It would also be interesting to research how many of these students actually earned an associate degree in another major before transfer.

Concluding remarks

The intent of this research study was to address a gap in the literature regarding the success of community college transfer students who join native students in a Midwestern, private, Catholic, liberal arts university. As the shortage of registered nurses is only expected to grow over the coming decade, institutions of higher education will need to deploy innovative teaching strategies to increase the numbers of graduates for the registered nurse work force. This study revealed that community college transfer students can and do graduate alongside native students in a baccalaureate nursing program. It has also added to the research that students who enter community colleges, planning to graduate with a four year degree are able to reach that goal.

Decreasing the attrition rate of students admitted can be solved either by academic settings becoming highly selective and taking only the brightest and the best, lowering nursing education standards, or supporting the somewhat less prepared student who enters a nursing program. The result of every nursing program becoming highly selective will be lower numbers of graduating nurses, increasing the nursing shortage. It certainly is not suggested that nursing programs decrease their standards of learning to admit more students. Nursing education needs to develop remediation programs to assist the underprepared student in meeting those standards and satisfy the needs of the looming nursing shortage.

The United States is bracing for the largest shortage of registered nurses the health care system has ever experienced. As the population of “baby boomers,” (those born between 1946 and 1960 turn 65 beginning in 2011) the nation will be faced with

providing health care services to the largest group of elderly Americans in history. Unlike previous generations, this group has had the advantage of advanced medical care that will allow them to live well into their 80s and even 90s (Buerhaus, Staiger, & Auerbach, 2009).

This study identified variables related to persistence of students in a registered nursing program at a mid-sized, private, Midwestern, Catholic, liberal arts university. It is hoped that the findings of this study will contribute to preparing a capable and comprehensive nursing workforce to serve the present and future needs of the American people. Little empirical research has been completed regarding the persistence rates of community college students in specific academic disciplines, such as nursing. At the same time, there has been very little research on community college transfer students at private, liberal arts Catholic universities. Hopefully this study will begin to close those gaps and inspire other researchers to explore and investigate the issues raised in this study and therefore, reduce the problem of student nurse attrition in an attempt to address the nursing shortage.

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APPENDIX A

Permission for Jeffreys's Model

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APPENDIX B**Letter of Request for Permission**

Rita Amerio PhD (c), RN
17045 Chalen Ct.
Lockport, Illinois 60441
Ameriori@lewisu.edu
November 15, 2009

Permissions Editor
Springer Publishing Company
11 West 42nd Street
New York, New York 10036-8002

Dear Publisher:

I am writing to request to use the Model of Nursing Undergraduate Retention & Success (NURS) in my research study. The study addresses the almost 50% attrition rates in many nursing programs today. Specifically, my research will study community college transfer students as they move into a pre-licensure baccalaureate nursing program in a private liberal arts university. It will be a retrospective study looking at students who matriculated through the chosen program from fall of 2001 to fall of 2006. The formal purpose is to identify whether or not there was a difference in retention to graduation for community college transfer students versus native students enrolled in the College of Nursing and Health Professions at a Midwestern United States university.

I have mailed a copy of this request letter to the author:

Dr. Marianne R. Jeffreys
The City University of New York College of Staten Island
Nursing Department
2800 Victory Boulevard
Staten Island, New York 10314

Sincerely,

Rita Amerio PhD (c), RN
Undergraduate Director of Nursing
Lewis University
College of Nursing and Health Professions
Romeoville, Illinois 60446

APPENDIX C**Email from Author**

Hello Rita,

Certainly you have my permission to reproduce Figure 1 with the appropriate citation. Would love to hear about your research and what you find.

Cherylyn

Cherylyn Cameron
Associate Vice-President
University Partnership Centre, Research and Scholarship
Georgian College
1 Georgian Dr.,
Barrie, On
L4M 3X9
1-705-728-1968
fax: 1-705-722-1507

Your degree is closer than you think

From: Amerio, Rita [AmerioRi@lewisu.edu]
Sent: Friday, March 05, 2010 6:08 PM
To: Cherylyn Cameron
Subject: Permission

Dr. Cameron,

I am completing my dissertation on the persistence of community transfer students in a baccalaureate program. I found your journal article "Experiences of Transfer Students in a Collaborative Baccalaureate Nursing Program" very helpful as a resource. I would like to have your permission to reproduce your "Figure 1 Proposed Conceptual Model" in my dissertation giving you proper credit.

Thank you,

Rita Amerio
Lewis University
Romeoville, Illinois
Director of Undergraduate Nursing

--

This message was scanned by the Georgian College ESVA and is believed to be clean.

APPENDIX D**Request for Publisher Permission for Cameron Article**

Experiences of Transfer
Students in a Collaborative
Baccalaureate Nursing
Program

Author: Cherylyn Cameron

Publication: COMMUNITY COLLEGE
REVIEW

Publisher: Sage Publications

Date: 10/01/2005

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APPENDIX E**IRB Letter from Dean**

January 7, 2010

To Members of Local Review Board/Institutional Review Board:

This letter is being written in support of the research work being undertaken by Rita Amerio, RN, PhDc in conjunction with the dissertation requirement for her doctoral program. *In addition to the dissertation enhancing her knowledge base, it will be of value to the College of Nursing and Health Professions pre-licensure program as she will be looking at indicators of successful retention of pre-licensure students.*

Ms. Amerio has requested access to pre-licensure student files as part of her data collection. Permission is granted for this.

If you have any questions, please feel free to contact me.

Sincerely,

Peggy

Peggy Rice, EdD, APN

Dean and Professor

College of Nursing and Health Professions

cc: Rita Amerio, RN. PhDc

Rita Amerio
 17045 Chalen Ct.
 Lockport, Illinois 60441
 H: 815-836-3722
 W: 815-836-5340
ameriori@lewisu.edu

Education

Old Dominion University, Norfolk, Va.
PhD candidate

2004-present

Dissertation: PERSISTENCE OF COMMUNITY COLLEGE TRANSFER STUDENTS

IN A PRIVATE LIBERAL ARTS UNIVERSITY NURSING PROGRAM

St. Xavier University Chicago, Il.
Masters Degree in Nursing
Focus: Family Nurse Practitioner

1996

Lewis University, Romeoville, Il.
Baccalaureate in Nursing

1985

Teaching Experience

Director of Undergraduate Nursing Studies – Lewis University

2007-present

Responsible for curriculum development and maintenance as well as day to day functioning of Undergraduate College of Nursing under the leadership of the dean. Active promotion of activities to promote future of undergraduate education in the school of nursing.

Department Chair – Nursing, Moraine Valley Community College

2006-2007

Managed day to day functions of nursing department, responsible for Curriculum development, adjunct faculty hiring and supervision.

Assistant Professor – Nursing, Moraine Valley Community College **2004-2007**

Same as below with additional lead teacher responsibilities

Instructor – Nursing, Moraine Valley Community College **2000-2004**

Developed syllabus and overall course structure, including weekly lab practicum, and administered all grades.

Adjunct Instructor – Nursing, St. Xavier University and Moraine Valley **1998-2000**

Clinical supervision of students in hospital practicum experience.

Related Experience

Certified Family Nurse Practitioner employed in family practice areas **1996-2000**

Clinical Nursing Supervisor in private physician practice **1989-1994**

Clinical Nursing Manager for Humana Health Services **1985-1989**

University Service

- *Member of Title IV Steering Committee –Infusion of Latin American Culture into Lewis University*
- *Member of Multiple Search Committees*
- *Scholars Academy*

- *Attended ELM (Exploring Lasallian Mission) Lewis University*
 - *Member of University Academic Affairs Committee*
 - *Member of General Education Curriculum Review Committee*
 - *Member of Student Learning and Outcomes Committee*
-

Funding

Program Director for \$35,000 Illinois Board of Higher Education Grant (January 2008-May 2010)

Aided in the development of new simulation lab in the CONHP

Presentations

- *Conducting Pre- and Post-Clinical Conferences presented at the “Clinical Faculty Academy” Moraine Valley Community College, Palos Hills, IL. August 5, 2009*
 - *Why We Are Here—What is the Context for Curricular Design and Clinical Instruction presented at the “Clinical Faculty Academy” Prairie State Community College, South Holland, IL. August 6, 2008.*
-

Community Service

- *Active member of parish community*
- *Eucharistic Minister – Minister to the sick.*
- *Active member of Christ Renews His Parish*
- *CCD Instructor*
- *Sigma Theta Tau Leadership Succession Committee Chair*

Memberships

- *Sigma Theta Tau*
- *International Nursing Association for Clinical Simulation and Learning*
- *National League for Nursing*