

2011

Associate Degrees in Health Related Occupations as Predictors of Success in Physician Assistant Programs

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Associate Degrees in Health Related Occupations as Predictors of Success in
Physician Assistant Programs

by

David E. Kotun

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Education
Department of Adult, Career, and Higher Education
College of Education
University of South Florida

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Date of Approval:
November 4, 2011

Keywords: PANCE, PACKRAT, Completion, Healthcare, Admissions

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Dedication

This is dedicated to my parents, Ed and Tina Kotun, who always knew I could do it, and to my lovely wife, Candy, who stood by me while I did.

Acknowledgements

Many people contributed to this document. My department chair, Dr. Jamie Brownlee at the College of Medicine, University of South Florida gave me the encouragement and showed patience as I began this journey. My first advisor, Dr. Lynn Taber, who passed away before I could finish, gave me the confidence to continue after my first course. Dr. Jan Ignash showed me a version of research that really opened my eyes. Dr. Michael Mills showed how the backbone could take shape when you just thought about it for a little while. Dr. Richard Roetzheim stuck with me as the only committee member who was there all the way. His help was invaluable. Drs. Donald Dellow and W. Robert Sullins joined my committee as prior committee members left the University of South Florida. I prize their wisdom, experience and common sense approach. Lastly, Dr. William Young, who jumped in during an emergency, stayed with me during some hard times for both of us, and got me moving in this project. He is the cornerstone of this project's success. Ray McCrory, my editor, was extremely valuable. You all are great people and I owe the completion of this dissertation to your effort, patience, and compassion.

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Abstract

The primary purpose of this study was to determine if applicants who had an associate degree in the health sciences prior to acceptance to a physician assistant program would do better than those applicants without an associate degree in the health sciences on three measures of success of physician assistant education. The three measures of success used were graduation rates, scores on the Physician Assistant Knowledge Rating and Assessment Tool (PACKRAT), and performance on the national certifying exam, the Physician Assistant National Certification Examination (PANCE). Data used for this dissertation were taken from original source documents and raw data sent to Nova Southeastern University by the PACKRAT and PANCE testing services. The study population was the three classes graduating in 2007 to 2009.

Correlations between the groups and their measures of success showed that there were no statistically significant difference in the graduation rates or PACKRAT scores (p-value was 0.328 and 0.095 respectively). The variable having a statistical significance was PANCE scores. The mean scores between the groups were significantly different (p-value 0.012) with the group without an associate degree in the health sciences having higher mean scores.

Coincidental findings showed that older students and students with higher graduate records examination (GRE) scores did better on the PANCE. Following this, further data analysis showed that the group with an associate degree in the

health sciences were older (p-value 0.06) and scored statistically lower on the GRE (p-value 0.012).

Findings showed that many of the considerations used to select students for physician assistant programs did not make a difference in outcomes. The two that did were age and GRE scores. The study group with associate degrees in the health sciences was, on average, older, had lower mean GRE scores and demonstrated the most gender and ethnic diversity. Programs using admission data to select students for the best chance of success should consider student educational experience and GRE scores, especially when some schools are looking to increase diversity in the students entering their programs.

Chapter 1

Introduction

There is an identified need for quality health care in America today. Shortages of primary care physicians are real and impact the quality of life in our country. The Future of Family Medicine Project, a recently published article in the Journal of the American Medical Association (JAMA), examined the growth rate of family medicine and other primary care specialties and found that those specialties did not keep up with the population or the growth rate of other subspecialties. This finding compared the expectations reported in 1996 in the first Institute of Medicine Report to the current state of family medicine (Future of Family Medicine Project, 2004). A vibrant primary care system is a large and necessary part of high-quality health care delivery (Barr, 2008). Florida is among those states feeling the impact of three critical factors affecting the need for increased health care: (a) an aging physician population, (b) an influx of new residents, and (c) a growing geriatric population. Family and internal medicine workloads are predicted to increase by 29% and pediatric workloads by 13% by 2025. The supply of generalists for primary care will increase at best by 7% or at worst by 2% if current medical school residency entry trends continue (Colwill, Cultice, & Kruse, 2008).

In the United States, there are three groups that provide the primary care services for the bulk of the populace. These groups are physician assistants (PA), nurse practitioners (NP), and primary care physicians (PCP). It is through these primary caregivers that most patients enter the medical care system. A multidisciplinary approach using physician assistants and other office personnel to provide quality health care in sufficient quantity was predicted (Future of Family Medicine Project, 2004) as a necessity in the United States. The same project also noted a 50% decline in medical students entering family medicine residency training from 1997 to 2003. Physicians are the final decision makers in our health care system. Physician assistants and nurse practitioners function under the auspices of physicians to provide care as licensed health care providers. Physicians who specialize in the primary care specialties are the *gatekeepers* forming the entry portal to medical care. Primary care clinics are the first stop in comprehensive medical care. The primary health care providers (PHCP) consist of physicians in one of three specialties. The first is the family medicine physicians who take care of all ages and manner of diseases. The age range for family medicine clinics is usually from two months until and through the geriatric years (65 years and older). The advantage family medicine specialists may have is that almost all ages and both genders are their patients. Allowing the same physician or clinic to care for the entire family also facilitates continuity of care, a benefit when the health of an entire family is involved. Another primary care specialist is the pediatrician who cares for patients from birth to eighteen years of age. In a pediatric clinic, children, adolescents, and teenagers have a

portal into medical care, but also have continuity of care lasting only until they outgrow the clinic. Last, general internal medicine accepts adult patients only, caring for chronic diseases and conditions. Physicians team with physician assistants and nurse practitioners to increase access and provide high quality medical care. Of physicians, physician assistants, and nurse practitioners, only physician assistants are trained as generalists and can move into any of these three traditional primary care specialties immediately upon graduation.

Physicians and nurse practitioners attend medical training with a path to a specific specialty.

Physicians must specialize in their chosen field during their residency training and nurse practitioners must also choose a specialty prior to graduation.

Nurse practitioners obtain specific degrees as pediatric nurse practitioners (PNP), family nurse practitioners (FNP), or adult nurse practitioners (ANP).

Physician assistants uniquely are trained as generalists with a wealth of clinical training focused on primary care. This generalist training enables the profession to adapt to the changing needs of the health care climate. Current health care legislation has now provided for an additional 32 million people to have access into the American health care system. Medical schools, residency programs, and nursing programs are unable to keep up with the demand to provide sufficient numbers of primary care providers. The projected health care demands in the very near future will far outweigh the availability of health care for the increased patient population. The pathway to physician assistant education is the fastest way to increase output of high quality, affordable primary care providers.

These three groups of health care providers generally have different backgrounds and entry pathways into health care. Physicians usually are individuals who pursue this career track from their secondary education. They have a science background, then begin undergraduate education in a pre-medicine program and then go to medical school. Students following this track have a great depth of knowledge in the basic sciences as applied to medicine. Following a career track so focused and vertical can limit the medical student's life experience and breadth of other knowledge. Nurse practitioners begin their path to a nurse practitioner as registered nurses (RNs) or may start with a four-year bachelor of science in nursing (BSN). These individuals start technical/vocational education to get their entry level nursing degree that enables them to proceed with the testing and certification necessary to become licensed as a registered nurse. Programs that bridge the gap between the entry-level nursing degree, allowing RNs to progress to a baccalaureate degree, a bachelor of science in nursing (BSN), then to a master's degree in nursing are in place presently. The master's degree may be a master of science in nursing (MSN) or, for those who wish to be in direct diagnosis and treatment of patients, a nurse practitioner (NP) degree. Nurse practitioners are specialized by their training as they complete their degrees. They may be adult nurse practitioners, pediatric nurse practitioners, nurse midwives, or family nurse practitioners to list the more common specialties.

Physician assistants generally have baccalaureate degrees upon entry into the physician assistant programs. Most complete baccalaureate degrees in

the following pathways. First is by earning a baccalaureate degree in a four-year college. Second is by earning an associate of arts (A.A.) degree as a transfer degree to a four-year college for a baccalaureate. Third is by earning a vocational two-year degree, such as an associate of science (A.S.) or associate of applied science (A.A.S.). These students may often seek employment for a time and decide to return to college to complete a four-year degree. Vocational four-year degrees are bachelor of science (B.S.), bachelor of applied science (B.A.S.), or in the medical fields, the degrees may be the bachelor of health science (B.H.Sc.) or several degree designations delineating the specialty of the degree, such as bachelor of applied arts and sciences (B.A.A.S.) with the field delineated. Vocational degrees have technical focus, and provide one of the key ways to apply to most of the physician assistant programs in the United States.

The choice of degree path to physician assistant education is often dictated by circumstance. For instance, students may enter a two-year vocational/occupational program for rapid entry into the health care job market early in their careers. After gaining experience in the workforce along with the maturity and desire to do more for patient care, these workers seek progression in their chosen career by means of furthering their education to a baccalaureate degree in a health care field. Even after a technical baccalaureate degree in health care and doing patient care on a day to day basis, a health care professional might see the need to become more involved in actual patient diagnosis and treatment. This privilege is given only to those who hold a license to practice medicine whether as a physician, physician assistant, or nurse

practitioner. Of the three, physician assistant education is the career choice that accepts students from the most varied backgrounds, making it the profession with the most experiential diversity.

The physician assistant profession was touted by the Bureau of Labor Statistics (BLS) as expected to “grow much faster than the average” (U.S. Department of Labor, BLS, 2009). Physician assistant numbers are expected to grow more than twenty percent in ten years. The BLS also stated that job opportunities for physician assistants should be “good”, particularly in rural and inner-city healthcare facilities. Employment is expected to grow by almost forty percent from 2008 to 2018 (US Department of Labor, BLS, 2008). Many students who choose to enter this profession are students who have begun their college experience in the community college. In 2008, over 700,000 associate degrees were granted in the United States (National Center for Education Statistics [NCES], 2008). Several of the feeder programs to the physician assistant profession are vocational/technical degrees that began as associate degrees and have become technically focused baccalaureate degrees. The most common entering fields of study are in the health sciences or health care professions. Since most of the physician assistant programs in the United States today grant a master’s degree on completion, a baccalaureate degree is the most common entering degree. This is true for nine of the ten physician assistant programs in Florida that award a master’s degree upon completion.

The physician assistant profession has enjoyed rapid growth in the recent decade, and physician assistant programs currently have large numbers of

applicants for the 159 (Accreditation Review Commission for the Physician Assistant, Inc., 2011) programs in the United States. These applicants have had prior education and many have had careers before physician assistant school. A large percentage of non-traditional students can be found in most physician assistant programs, as many medical jobs require a technical degree or certificate as the education level to enter the profession. The community college is the primary technical associate degree grantor in the United States (Lankard-Brown, 1999). A goal of this study is to determine if applicants to physician assistant programs who have earned a two-year degree in health sciences may have a better chance of completing the program and successfully passing the standardized tests than students who have taken a traditional track earning a baccalaureate degree or an associate of arts degree as a transfer degree to a four-year institution to earn a baccalaureate degree.

Completing a recognized program and passing the Physician Assistant National Certifying Examination (PANCE) are the two items that are the final objectives of physician assistant education. The applicants to physician assistant programs who have completed a two-year program in a health related field may have more medically related experience than the students who have not. This could make a difference in the completion rates in their degree programs, as well as in their successful passing of the certifying exam, the PANCE.

This research project was a retrospective study based on students entering the Nova Southeastern University (NSU) Physician Assistant programs. Students selected for the study were those who were accepted into the programs

during a three-year period using entry years 2005 to 2007 and graduating in 2009. Comparisons were drawn between the more traditional students who completed an associate degree for transfer to a baccalaureate or those attending a four-year institution as their first matriculation for post-secondary education and those who first completed a vocational two-year degree then returned after work experience to complete their four-year degree.

Three milestones measure success during physician assistant training. First, completion of the program and earning a master's degree is the objective end point that prepares the student to enter this vocation. A comprehensive exam called the Physician Assistant Clinical Knowledge Rating and Assessment Tool (PACKRAT) is taken during the clinical portion of all physician assistant programs at Nova Southeastern University. Results from those exams were also compared for the two study groups (A.A. to B.A., or B.A. only, and A.A.S. /A.S. to B.A. /B.S.). Noteworthy is that the PACKRAT exam is given only once during the clinical portion of physician assistant curriculum at two of the study programs and twice at the other, the first being in the classroom or didactic portion of the curriculum then later in the clinical portion of the program. The test taken in the clinical portion, the second year of physician assistant school, was used for the study. The practice of the physician assistant programs studied to give the PACKRAT exam once in one of the studied programs and twice in the other studied program is considered as a possible limitation to the study. The students are already familiar with each program's regular course testing format, because Logic Extension Resources (LXR) testing is used in each program and for the

PACKRAT. A study by Cody, Adamson, Parker & Brakhage (2004) showed a positive correlation of PACKRAT to success on the (PANCE). The PANCE is a national examination and is a comprehensive evaluation tool that, once passed, allows a physician assistant to apply for licensure in every state, the District of Columbia, Guam, and the United States Virgin Islands.

Statement of the Problem

Retaining a sufficient number of primary health care providers is becoming increasingly difficult. Physicians are increasingly choosing specialties in areas other than primary care, such as Family Medicine, Internal Medicine, and Pediatrics. Practitioners in these specialties are at the mercy of lowered insurance reimbursements, higher malpractice costs, and a relatively lower standard of living compared to other medical specialists. Many bright undergraduate students, however, have been exposed to the physician assistant profession. Exposure may be through working in an environment that also employs physician assistants, contact with physician assistants as their personal or family health care providers, or knowing physician assistants as family or friends. Few get this current information from guidance counselors or doing job searches through school or media resources. These students are making a choice based on current employment potential, salary estimates, quality of lifestyle, and future need and projected growth of the physician assistant profession. These reasons, may contribute to the annual increase in applications to physician assistant.

The number of applicants for the existing physician assistant education programs far exceeds the number of seats. Physician assistant programs that have multiple applicants for each seat need to select those students who are most likely to succeed. Physician assistant programs need the best predictors of success at the time of candidate selection to operate each program at its highest efficiency. The majority of programs now use an application system called the Centralized Application System for Physician Assistants (CASPA). CASPA gathers the following information about each applicant: (a) education history with an itemized grade sheet, (b) employment record, (c) volunteer and service activities, (d) health care experience, (e) letters of recommendation, (f) a personal statement, and (g) enough demographic data to categorize the student. Other demographic data include age, gender, ethnicity, address, and personal contact information.

Several studies have been conducted to identify characteristics based on application information that would correlate positively with success in physician assistant programs. However, there has been no single category that has been a defining corollary to success, even though several studies have used different criteria to predict success. Past studies have used two categories of data. First are criteria that were in place before the student matriculated in their physician assistant program. Second are the informational items that are collected after the student is accepted. One criterion used before matriculation has been the grade point average (GPA), both overall GPA and the GPA in science courses only. Another is the prospective student's health care exposure, both as an active

health care worker and as an observer during what is termed *shadowing*. The United States Armed Forces Combined Physician Assistant Program (CPAP) conducted a study that found students who had a medical job in the armed forces prior to being accepted to physician assistant school did not do as well as students who did not have a medical job (Oakes, MacLaren, Gorie, & Finstuen, 1999). There were no controls in that study for age, prior grades, standardized test scores, or past education. Studies using criteria developed during each individual program have also been attempted. One such attempt was to use the overall grades earned in the first semester of study. Another correlated the PACKRAT scores to success on the PANCE needed for licensure in Florida. No studies discovered in the current literature review have attempted to correlate associate degree completion with successful physician assistant program completion.

So far, no single criterion or criteria in combination have been identified as consistently reliable predictors of success in physician assistant programs. Discovery of additional criteria that may be a reliable predictor of success in the physician assistant program would improve the process of selecting students with the best chance of completing physician assistant programs. Nationwide, physician assistant schools have a 4.4% non-completion rate. Lowering this rate would benefit each physician assistant program as well as the students who are accepted to the programs.

Purpose of the Study

This study was conducted to determine what effect adding another criterion to student selection could have on student success in physician assistant programs. Will students with associate degrees in the health sciences increase the prediction of successful completion in physician assistant programs? Of the many categories of information found in the applicants Central Application Service for Physician Assistants (CASPA) application and combinations of those elements studied in the past, the associate degree in health science had not been investigated.

If a vocational associate degree is present, especially one in the area of health sciences, that applicant may have already entered the work force. Therefore, students who have started a post-secondary career with a past associate degree may do significantly better than the students who matriculated straight to a baccalaureate degree only. If this turned out to be true, the fact that they earned a vocational associate degree can give physician assistant programs another criterion to use when choosing students having the best chance for success. This study followed students' progress from their applications to physician assistant programs to graduation from physician assistant programs, their performance on the PACKRAT exam, and the PANCE exam scores. Graduation from the master's degree physician assistant program was the endpoint to measure success of the student within the program; while the PACKRAT and PANCE scores were indicators of how complete was the students' required knowledge base.

Significance of the Study

Nationwide, there are approximately four and one-half students for each seat in physician assistant programs. With this many applicants per seat, selecting students with a good chance for success is paramount. Students applying for highly competitive physician assistant programs can be selected using a known item as a marker that could show better success in physician assistant programs and on national certifying examinations. Until now, NSU has used the best correlation for which they had empirical data. This was the grade point average in the undergraduate science courses. Could an additional admission criterion measure increase the success of students attending physician assistant programs? Students who enter and do not successfully complete the physician assistant programs will have taken a seat from a student who might have been successful. This robs the community of a much-needed licensed health care provider, creates debt for the unsuccessful student, and causes a loss of tuition revenue for the university.

Research Questions

The following research questions were addressed in the study:

Question 1 – Will physician assistant students who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science, A.A.S.) in the health sciences have statistically similar program completion rates as students who did not have such a degree?

Hypothesis 1 – Physician assistant students who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science,

A.A.S.) in the health sciences will have statistically better program completion rates than students who did not have such a degree.

Question 2 - Will physician assistant students who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science, A.A.S.) in health sciences have statistically similar scores on a standardized test, the Physician Assistant Clinical Knowledge Rating and Assessment Tool (PACKRAT), than those who have no associate degree in health science?

Hypothesis 2 - Physician assistant students who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science, A.A.S.) in health sciences will have statistically better scores on the standardized test, the Physician Assistant Clinical Knowledge Rating and Assessment Tool (PACKRAT).

Question 3 - Will physician assistant program graduates who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science, A.A.S.) in health sciences have statistically similar scores on a standardized test, the Physician Assistant National Certifying Examination (PANCE), given to physician assistant students before they are eligible to apply for licensure?

Hypothesis 3 - Physician assistant program graduates who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science, A.A.S.) in health science will have a statistically better score on the standardized test, the Physician Assistant National Certifying Examination

(PANCE), given to physician assistant program graduates before they are eligible to apply for licensure.

Definition of Terms

Degree types.

Certificates/licensure. According to Lankard-Brown (1999), certification is “certification of competence in the ability to perform the duties of an occupation [that] indicates a person’s achievement of predetermined standards. It offers a benchmark for assuring that the individual possesses the qualifications required for employment in a given occupation or occupational specialty. It involves learners in an educational process for achievement of competencies required by national or state regulations (e.g., teacher certification); professional associations or organizations (e.g., Certified Public Accountants [CPAs]); or industry certification (e.g., Novel Certified Engineer) (America’s Learning Exchange, n.d.). Certification is a nonstatutory requirement, which distinguishes it from licensure. Licensure, a more restrictive regulation, grants individuals legal rights to practice a profession given the minimum requirements established by the profession are met. It describes ‘who can and cannot practice a profession’” (p. 212).

Certificate/diploma program. “Certificate/diploma programs refer to formal programs of study that are less than two years in length and lead to a certificate or diploma from the sponsoring college or university. The certificate/diploma program must award academic credit and must be a recognized award by the state. Certificate/diploma programs may be associated

with or awarded to complement a degree, or may be separate programs” (Marks, 2003, p. 106).

Associate degrees. The Digest of Education Statistics defines an associate degree as follows: “A degree granted for the successful completion of a sub-baccalaureate program of studies, usually requiring at least 2 years (or equivalent) of full-time college level study. This includes degrees granted in a cooperative or work-study program” (Snyder, Dillow, & Hoffman, 2009, p. 669). In the Digest of Education Statistics, associate degrees are not broken down into the various types of associate degrees.

“Employment or advancement in a specific career is the main purpose of enrollment in an associate degree program. Associate degrees are offered primarily by community and technical colleges; 75% are vocational, focusing on business technologies and health, public, and engineering technologies. Approximately 58% of the registered nursing (RN) programs in the United States, for example, are associate degree programs. A 2-year program of full-time study after high school is required to receive an associate degree” (Lankard-Brown, 1999, p. 212). An alternate definition is a “degree granted for the successful completion of a sub-baccalaureate program of studies, usually requiring at least 2 years (or equivalent) of full-time college-level study. This includes degrees granted in a cooperative or work study program” (Snyder, 2005, p. 7).

Associate of arts degrees. Associate of arts degrees were the first two-year degrees created, enabling students at that time of junior colleges, to be able to transfer to the partner four-year college. As this particular degree type

matured, it became a transfer degree. Students in an associate of arts program completed their lower division, freshman and sophomore coursework, and then transferred to a four-year institution to complete their upper division courses and graduate with a baccalaureate degree (Kane & Rouse, 1999).

Associate of science degrees / Associate of applied science degrees.

The community colleges also offer job preparation or vocational training using a variety of designations for these degree types. They may be called associate of science (A.S.), associate of applied science (A.A.S.), associate of applied technology (A.A.T.), or many designations that describe the degree type and the specialty. For instance, the degree may be an associate of science in radiography (A.S.R.), or an associate of science in nursing (A.S.N.) (Ignash & Kotun, 2005).

Bachelor of science degrees/Baccalaureate degrees. “Completion of a 4- to 5-year full-time academic course of study after high school is recognized by award of a college baccalaureate degree. Persons having this degree are deemed to have the qualifications that make them potential candidates for jobs requiring a degree. It is estimated that today perhaps 30% of the work force is employed in a job that by law or custom requires at least a baccalaureate degree” (Lankard-Brown, 1999, p. 2). It is also a “degree granted for the successful completion of a baccalaureate program of studies, usually requiring at least 4 years (or equivalent) of full-time college-level study. This includes degrees granted in a cooperative or work-study program” (NCES, 2011).

Upper-division baccalaureate degrees refer to those programs that represent the final two years of study, typically junior- and senior-level courses, that when coupled with the presentation of an earned associate degree or credits equivalent to such a degree, will lead to a recognized four-year degree.

Master's degrees. Master's degrees refer to those programs that represent a defined area or discipline of study beyond the baccalaureate and lead to a recognized graduate degree. This is a "degree awarded for successful completion of a program generally requiring 1 or 2 years of full-time college-level study beyond the baccalaureate degree. One type of master's degree, including the master of arts degree (M.A.) and the master of science degree (M.S.) is awarded in the liberal arts and sciences for advanced scholarship in a subject field or discipline and demonstrated ability to perform scholarly research. A second type of master's degree is awarded for the completion of a professionally oriented program, for example, a M.Ed. in education, a M.B.A. in business administration, a M.F.A. in fine arts, a M.M. in music, a M.S.W. in social work, and a M.P.A. in public administration. A third type of master's degree is awarded in professional fields for study beyond the first-professional degree, for example, the Master of Laws (L.L.M.) and Master of Science in various medical specializations" (NCES, 2011).

Doctoral degrees. Doctoral degrees are conferred after completion of a graduate program in a defined area or discipline of study beyond the master's degree. These are "earned degree[s] carrying the title of Doctor. Other doctorates are awarded for fulfilling specialized requirements in professional

fields, such as education (Ed.D.), musical arts (D.M.A.), business administration (D.B.A.), and engineering (D.Eng. or D.E.S.). Many doctor's degrees in academic and professional fields require an earned master's degree as a prerequisite. First-professional degrees, such as M.D. and D.D.S., are not included under this heading" (NCES, 2011).

Accreditation and certification bodies.

Accreditation Review Commission on Education for the Physician Assistant (ARC-PA). Accreditation Review Commission on Education for the Physician Assistant (ARC-PA) is the national accrediting body that assures quality of education and adherence to standards expected from master's degree programs in medical education.

The ARC-PA began as a cooperative venture to assure quality in physician assistant education. The organizations involved were the American Academy of Family Physicians (AAFP), American Academy of Pediatrics (AAP), American College of Physicians (ACP), American Society of Internal Medicine (ASIM), American Medical Association (AMA), and Association of American Medical Colleges (AAMC). In December, 1971, the organization was called the Joint Review Committee for Educational Programs for the Assistant to Primary Care Physician (JRC-PA). The American Academy of Physician Assistants became a member in 1974. After several years, operating under that name, the JRC-PA was renamed in 1988 to the Accreditation Review Committee on Education for the Physician Assistant.

National Commission on Certification of Physician Assistants

(NCCPA). The National Commission on Certification of Physician Assistants (NCCPA) is the national body that administers the national certification initial test and the recertification test. The NCCPA is the only certifying body for physician assistants in the United States. They were established in 1975 as an assurance body. The NCCPA assures that all physician assistants meet minimum knowledge standards for the profession.

Physician Assistant National Certifying Exam (PANCE). The Physician Assistant National Certifying Exam (PANCE) is a national standardized exam that allows the prospective physician assistant to apply for licensure in all 50 states, District of Columbia, Guam, and the United States Virgin Islands. In order to take this exam, a prospective physician assistant must graduate from an accredited physician assistant program. Passing this exam consists of answering a battery of general medical knowledge questions. Scoring the exam is done by points awarded for questions answered correctly. The prospective physician assistant must score over a predetermined threshold in order to be accepted for licensure. Once the graduates pass this exam, they are allowed to add the -C designation to their title making the official title PA-C. It is against the law to use the PA-C designation if the physician assistant is not currently nationally certified.

Physician Assistant National Recertifying Exam (PANRE). The Physician Assistant National Recertifying Exam is a national standardized exam that physician assistants are required to take every six years to maintain national

certification. It is similar to the PANCE, and must be passed in order to maintain certification. The PANRE, as well as the PANCE, is given at six-month cycles at Prometric testing centers around the world.

Community college degrees and functions.

Transfer. Transfer is defined as maintaining course equivalencies and commonalities allowing courses and programs of study to be recognized and accepted at various institutions (Cohen, 1996). Transfer, as an entity, generally serves as policies, guidelines, and recommendations to enable articulation (Townsend, 2000).

Articulation. Articulation is the actual movement of student's credit hours earned from institution to institution (Cohen, 1996). Agreements that make transfer possible are the articulation portion of this function (Townsend, 2000)

Vocational education. "Organized educational programs, services, and activities which are directly related to the preparation of individuals for paid or unpaid employment, or for additional preparation for a career, requiring other than a baccalaureate or advanced degree" (NCES, 2011). Vocational education if not a degree-granting program, will offer a certificate that can denote proficiency or competency in a certain area. Community colleges often collaborate with local businesses in order to offer programs that fill the need of the community.

Since the 1970s, community colleges have prepared students to enter the workforce in specific occupations. These programs of study encompassed areas

of training in occupations like automobile repair, jet engine mechanics, printing, and radiologic technology (Cohen, 1996).

Scientific degrees. Degrees in the sciences prepare students for occupations in scientific or technical fields. Some examples are engineering, chemistry, biological sciences or physical sciences, as well as engineering and math. These are the subjects commonly called the STEM subjects, or science, technology, engineering, and math. The degree designation names the specialty after the level of education.

Technical degrees. Technical degrees have expanded on the vocational education function of the community college and technical school. Technical degrees, at best, fill a need in the local community, state, and nation for workers in specific areas and at specific skill levels. The technical degree is determined by local need and in partnership with local businesses much like the vocational degrees. The technical degree adds a more academic dimension to the vocational training program by adding some scholarly subjects. These subjects may include communications, English, mathematics, and social sciences.

Study Limitations and Delimitations

Study Limitations. The study was done on the data available through the Nova Southeastern University's physician assistant program application process. This includes all the CASPA data and data gleaned from the NSU supplemental application. Nova Southeastern University is a private not-for-profit university. There are three other types of physician assistant programs in Florida. One type of program is a certificate program that does not award a degree,

another type of program awards a masters degree as part of the state university system, and the final type awards a masters degree from a for-profit private university. Further dividing the types of physician assistant programs are those programs that are coupled with colleges of medicine as opposed to those that are in colleges of allied health or health sciences or are stand alone programs. Data used in this study did not include applications from any other type of physician assistant program. Conducting the study on only one type of institution limits the variety of data gathered. This choice was made due to the ability to access the data needed, as well as the ability to gather the PACKRAT and PANCE data as raw data. Investigating physician assistant programs with multiple characteristics should increase the breadth of the study data and the accuracy of the results because of the increased number and variety of subjects.

In one of the Nova Southeastern University physician assistant programs, the PACKRAT exam is given twice to the students. The exam is given once in the didactic portion of the curriculum and then again in the semester prior to graduation. During the semester prior to graduation, the students are in their clinical rotations for that part of their physician assistant education. In the other two physician assistant programs studied, the students took the PACKRAT exam only once. The exam is given to the rest of the physician assistant students during the semester prior to graduation, during the clinical portion of their curriculum. Whether or not taking the PACKRAT exam twice has an effect on subsequent performance on the certifying exam, the PANCE, is unknown for this institution.

Additional limitations secondary to using only one type of institution need to be considered. A single institution would have a more limited geographic catchment area for students than multiple institutions would. Much of the data used in this study are available in national databases and subject selection may be done using different criteria. Students at one institution meet similar sets of entrance requirements. A single set on entrance requirements could skew the study population at selection. The institutional faculty would be the same with few exceptions for attrition and hiring during the time frame of the study. Stable faculty would remove a variable in the education of these subjects, but the effect of a more diverse faculty population could not be studied. Lastly, the undergraduate degree major was not considered, only the associate degree. A pure scientific or technical baccalaureate degree could make a difference but was beyond the scope of this study.

The time frame of the student records studied was over three years and yielded about 400 subjects. A small concern is that the number of students with vocational associate degrees was not adequate. The number of subjects with vocational associate degrees needed for adequate power was fifty or more. This threshold was exceeded by the actual number of subjects with vocational associate degrees. The data gathering and analysis was completed by a single researcher thus limiting objectivity by some degree. Since the Data were contained on first person documents, and the categories were already in place, this manifested as a small if nonexistent problem.

Study Delimitations. Several application criteria were ignored. Items that can be true confounders occurring during matriculation, such as grade point average, or physical diagnosis skills performance grades earned after acceptance were not placed in the analysis. The science GPA and the GRE scores have been the subject of much study and their investigation were not repeated in this study. The science GPA has been used as a basis of the selection as a predictor of success in the NSU PA programs for many years. GRE scores have also been tried as an indicator but have been shown only to be an indicator of non-completion of the program if the student's score is low. As the data were examined, other items used in the application and selection process were omitted.

Using only one type of institution and a single type of program minimizes the effect of different faculty, learning environments, and geographic locations. Limiting these variables increases study homogeneity by limiting the effect of these variables. Entrance requirements are also standard across the population studied with very minor differences in each program's acceptance criteria.

Organization of Remaining Chapters.

Chapter two is a literature review of pertinent topics. Includes the selection of physician assistant students and the prerequisites for entry. The process by which students persist in their matriculation through the degree ladder from an associate degree, to a baccalaureate degree, and a master's degree can also be traced. Measures of success for physician assistant students will also be discussed. Chapter three discusses the methods of collecting and analyzing

data. Methods include data sources for the student application and acceptance, and methods for separating the sample groups. The design and process of gathering information for the case studies will also be discussed.

Chapter One Summary

This chapter introduces a concern that the selection process for physician assistant program will be more likely to select applicants with the best chance of success in the program. Doing this will also save the students tuition while preventing a premature loss of tuition revenue by the institution.

The discussion on limitations and delimitations helps determine the significance of variables found in the current study subjects that will be significant. There is the limitation of only one university and many items that have been used in past studies will not be considered.

Chapter 2

Review of Literature

The physician assistant profession is relatively new. The profession began in 1965 when physicians and educators realized that there were not enough physicians and that physicians were not always in the areas of greatest need. Dr. Eugene Stead realized that medical corpsmen in the United States Navy received considerable training during the Vietnam War but had no place to use this knowledge in the current civilian marketplace. He chose four corpsmen and began a training program based on the *fast track* training that was used to provide more physicians during World War II. This model was based on early *barber surgeons* during the Middle Ages and *surgeon's assistants* during the American Civil War (Society of Army Physician Assistants, 2009). The training, based on an abbreviated set of coursework and a rapid immersion into active apprenticeship, was able to prepare a medical care provider more rapidly than the traditional medical school.

This method was a success and there are now over 79,000 individuals who are eligible to practice as physician assistants. Physician assistants are licensed to practice in all 50 United States and territories with the exception of Puerto Rico. Now there are 142 accredited physician assistant programs in the United States, and programs are opening up in several countries.

Transfer Overview

The community colleges were originally designed as *feeder schools* for the traditional four-year college (Cohen & Brower, 1996). They were called *junior colleges, city colleges, branch campuses, or community colleges* as they are known today. As society needed more technical expertise and people with valuable skills needed some credentialing, the community college became one of the institutions that filled the vocational workforce for our country (Cohen & Brower, 1996). Today, many students begin their post-secondary education in the community college. These students may have the goal of transferring to a four-year college or of obtaining an associate degree or a certificate in a vocational field. Students who earn an associate degree and go on to a master's degree level physician assistant program usually attain a vocational associate degree, decide on continuing education, get a related baccalaureate degree, then proceed to a physician assistant program and master's degree. Many hours of searching revealed that there is a small, almost non-existent body of literature on the pathways from high school to master's degree level physician assistant programs. This study will hopefully add to that body of literature.

The community college did not begin giving stand-alone degrees, but were a way for crowded four-year institutions to deliver lower division courses. These courses had to be transferable and community colleges were tied to a four-year institution to which the students progressed. According to Buschel (2004), as the community college mission grew and diversified, the colleges offered precollegiate and remedial education to help students who needed refresher

courses or needed help to master previously taught skills. Vocational offerings readying students for the workforce became another important function of the community college. Many students enrolled in vocational programs did not fully realize what their chosen vocation demanded. In contrast to works by Rosenbaum (2001) and Bueschel (2004), students who are proceeding to physician assistant education do have an idea what is expected and can succeed in their higher education (Bueschel, 2009).

Retention, Persistence, Re-entry, Accreditation, and Credentialing

The focus of this paper is not an analysis of students who transferred from a two-year college directly to a four-year college, then continuing to graduate studies as discussed by Cohen and Brawer (1996). The physician assistant programs have large numbers of non-traditional students. Physician assistant students with a prior associate degree, in the health sciences especially, went to the community college for vocational education. These students usually work in a vocational specialty until they decide to continue to a baccalaureate degree. These varied patterns of education make for a transition to physician assistant school for a master's degree. Therefore, the description of persistence in the traditional model will not fit. In a recent article by Kinser and Deitchman (2007), the traditional persisters were described as "standard persisters [who] had never stopped out of college without earning a degree or credential, or had started college within three years of high school graduation and had attended continuously" (p. 77). The term *tenacious persisters* refers to returning students who have stopped out of college or who delayed their entry

into college for more than three years after high school. “They often leave college for a time; therefore, the usual model of persistence does not fit either” (Kinser & Deitchman, 2007, p. 75). These students have re-entered the education arena for what is essentially a vocational master’s degree. The students falling into this descriptive category are students who have re-entered college twice. Tinto’s (1975) model of persistence was originally a dropout model based on Durkheim’s suicide model. In 1988, Tinto’s model incorporated VanGennen’s theory of incorporation into a new society, that being the university environment.

Entry

Community colleges provide much of the United State’s vocational education today. We find that in the area of medical education, many students get their start and progress to a job in the health care profession in the community college. During the last ten years, the number of associate degrees granted rose by 28 percent. Many of these were in the health care fields (National Center for Educational Statistics, 2007).

Accreditation and Credentialing

Most of the physician assistant programs in the United States are accredited by two bodies. The accrediting body associated with physician assistant programs is the Accreditation Review Committee on Education for the Physician Assistant (ARC-PA). This organization became a freestanding accrediting agency on January 1, 2001. Its mission was to protect the public interest and the interests of the physician assistant profession, define standards,

and ensure compliance with those standards according to a special article written at the launch of this new body (McCarty et al., 2001). This special article listed those standards as well as the bodies from which the standards were drawn. These organizations included the American Academy of Family Physicians (AAFP), the American Academy of Pediatrics (AAP), the American Academy of Physician Assistants (AAPA), the American College of Physicians (ACP), the American Society of Internal Medicine (ASIM), the American College of Surgeons (ACS), the American Medical Association (AMA), and the Association of Physician Assistant Programs (APAP). Note that the APAP has been known as the Physician Assistant Education Association (PAEA) since 2005 (PAEA, 2011).

Another arm of physician assistant standardization is the National Commission on Certification of Physician Assistants (NCCPA). This organization was conceived and developed in 1972 and 1973 respectively. This body examines graduates of physician assistant programs to assure that physician assistants credentialed by the NCCPA meet minimum standards of “knowledge and clinical skills”. Three examinations are administered by the NCCPA: the Physician Assistant National Certifying Examination (PANCE), the Physician Assistant National Recertifying Examination (PANRE), and the Pathway II Examination. The National Board of Medical Examiners (NBME) develops these examinations. The PANCE and PANRE are both multiple-choice exams with questions about general medicine diagnosis and treatment. Passing the PANCE is recognized in all 50 states as a qualification for licensure, along with graduation from an accredited program. The PANRE is taken every six years by

physician assistants in practice to assure continuing practice standards are met. The Pathway II Exam is a non-traditional (take-home) exam for specialty physician assistants who do not work in a general medicine practice (Hooker et al., 2004).

Physician Assistant Entrance and Success

Entry into the physician assistant profession has been examined in two frameworks. The first is an essay of the recommended preparatory courses for this type of academic program. Elam, Seaver, Berres, and Brandt (2002) concluded that career path preparation should begin in high school with counselor interaction and information gathering, including contact with physician assistants working in the profession. Prerequisite courses are heavily weighed to the sciences, chemistry, anatomy, genetics, biology, and like studies. Most physician assistant programs ask for results of certain standardized testing: The Graduate Record Exam (GRE) and the Allied Health Professions Admissions Test (AHPAT) are two commonly mandated. Susan Kinsella (1998) wrote about the differences in the traditional and non-traditional students, their life challenges as well as their preferences in continuing in higher education. Non-traditional students were older and had acquired family and community responsibilities while traditional students had out of class interests in sports and fun. The reason for entry into a profession differed in that the traditional students had family members as role models that affected their choice of profession. The non-traditional students more frequently expressed a desire to help others or had a life event that led them to this career.

Benshoff and Lewis (1992) also researched the needs of nontraditional students and found that nontraditional students return to higher education for several reasons. Among them were financial considerations, competing responsibilities, changing job requirements, or to advance in the job market. This article also described *triggers* that led to their return as “events that precipitate the timing of an adult’s decision to return to school, most frequently career events and family changes” (p. 3).

As the physician assistant profession grew, it became more visible as a viable career. Applicants outnumbered the seats in accredited physician assistant programs. Selection of the applicants with the most likely chance of success became more critical. Most physician assistant programs use the Central Application Service for Physician Assistants (CASPA). This does not represent all the accredited physician assistant programs in the country so a nationwide study could find a limitation with the programs that do not use CASPA. In the CASPA Five Year Report, published in 2007, 69 percent of accredited physician assistant programs were represented by CASPA. The number of student applicants per filled seat in 2006 was 2.25. This was an increase from 1.81 applicants per filled seat in 2002 (Ruback et al., 2007).

As the physician assistant profession became a more popular and viable career the growth in applications created a need to select candidates efficiently. With an abundance of candidates, programs now had to make choices. Proper selection of entrants made from the abundance of candidates means the program will continue to have a high graduation or completion rate. This

provided an important part of the school's reputation, an uninterrupted source of tuition income, and a body of health care professionals that could serve the population. Schools soon began to test ways to select candidates with the best possible chance to succeed.

As an example, the University of Kentucky in 1998 attempted to predict connections between admissions criteria and outcomes of their students. They surveyed recently graduated physician assistants from the class of 1994 and their supervising physicians. Outcomes questions asked concerned knowledge of the field, communication ability, and competency to practice. Admissions criteria included the entry-level indicators test scores, grade point averages, prior education, interview scores, and finally, performance at different stages in the program. The article did not mention specific correlations between any one admission criterion and the outcomes. They did however change two parts of their intake process by doing one-on-one interviews instead of a team approach, and have their candidates write a short essay on a current medical topic. The University of Kentucky researchers also concluded that more study on outcomes research would be "worthwhile" (Skaff et al., 1998).

Cavenagh in 2006 conducted research at the Philadelphia College of Osteopathic Medicine on the route of entry of physician assistant students. Groups of students in two pathways were examined. The first group was composed of students who entered a three-year bridge program awarding a baccalaureate then a master's degree (bachelor of science/master of science program). The second group was made up of students having a baccalaureate

degree who directly entered the master's physician assistant program. This study did not look at success in program completion, but examined differences in practice specialty and location as the only outcomes. There was no statistical difference between the groups (Cavenagh, 2006).

Two other articles considered the measures of success that will be examined in this study, but with different independent variables. Telford et al. (2002) examined physical examination skills performance of students enrolled at North Texas Health Science Center as a measure of program attrition. Physical examination skills require a higher level of information processing than does standardized tests according to the author. Initial literature findings were that race, gender/ethnicity, and age were all associated with increased risk of academic difficulty. Academic difficulty was defined as lower than average test scores and program attrition. Based on this study of performance in physician examination skills, non-white students had a higher risk of academic difficulties. White students were shown to have 38% less risk than nonwhite students, men had approximately two-thirds less risk than women, and students older than 22 years old had slightly higher risk of academic difficulties. The nationwide attrition rate for physician assistant programs is 4.3% with the North Texas Health Science Center having a 13% attrition rate for their physician assistant students. This study showed a predictive rate of 66.7% for the attrition group and 93.8% for the non-attrition group. Every five (5) unit change in exam score (0 to 100%) produced an odds ratio of 53.98 for attrition (Telford et al., 2002).

Another of the measurements of success and progress of physician assistant students is the Physician Assistant Clinical Knowledge Rating and Assessment Tool (PACKRAT). A study completed at the University of Mississippi Physician Assistant program attempted to correlate personality traits from the Meyers-Briggs test and scores on two anxiety scales to higher performance on the PACKRAT. There was no correlation on PACKRAT success and Meyers-Briggs results categories. One question on the anxiety questionnaire was found significant. "During tests, I get so nervous I forget facts I really know" (Bourne et al., 2006, p. 44).

Measures of Success

For this study, measures of success are designated as graduation from the program as the objective of matriculation. During the program, the PACKRAT exam is given twice during the 27 months of the program. It is given first in the initial 14 months during the didactic portion and next during the last 13 months in the clinical portion of the program. The PANCE is taken usually within the first 90 days after graduation. Upon successful completion of this nationwide examination, physician assistants are able to apply for their state license in all 50 states and most territories. As expected, researchers have taken a look at factors that can help success in these three areas. In the last section, success defined by graduation was examined in several locations with different variables.

In the Interservice Physician Assistant Program run by the armed forces in San Antonio, Texas, Cody et al. (2004) compared performance of 375 students who took the PACRAT in their second year to their performance on their first

attempt at the PANCE. Using logistic regression, the researchers found that the relationship between PACRAT scores and PANCE performance showed a sensitivity of 77.2% and a specificity of 83.3% with a correlation coefficient of 0.668 ($p < 0.001$). There was additionally a strong predictive value (Cody et al., 2004) for success on the PANCE exam based on the PACRAT scores. This study compared a standardized test to another standardized test in contrast to comparing an aspect of the actual education process during matriculation to attempt to predict PANCE performance.

As this study was constructed, the prior Cody article and two other articles, one by Bruce (2004), and one by Kazik and Sefcik (2002) found a positive correlation between PACRAT and PANCE scores. Meanwhile, Asprey, Dehn, & Kreiter (2004) and Ennulat, Garrubba, & DeLong (2011) showed a negative correlation between age and PANCE scores. The study in question, by Massey, Sedrak, & Lee (2008), used an interactive learning process as the independent variable. Students had to create their own learning notes on each of the items on the NCCPA/PANCE disease list. Students were provided with the tools to create their own notes based on the PANCE disease list. These included study strategies, test-taking skills, and folio preparation. Using this change from a strict lecture format, scores jumped from 447 prior to the implementation to 511 after partial implementation. At full implementation, scores went to 546. Scores increased for all areas of the PANCE (Massey et al., 2008).

Another set of variables that were used to predict success were demographic variables taken from program application and entry data. This study by Oakes et al. (1999) took into account four demographic variables, three academic variables, and a clinical variable. Subjects were 88 students again from the Interservice Physician Assistant School, in San Antonio, Texas, from two classes in 1996. Results of the examination of the demographic variables showed that male gender, service component of the Army Reserve National Guard (ARNG), and a pay grade of E-7 had a positive correlation to success, albeit small, on PANCE results ($r = 0.212$, $p = 0.05$, and $r = 0.217$, $p = 0.04$, respectively). The aggregated test scores in the three trimesters of the first year were significant in PANCE success as follows: trimester 1, $r = 0.716$, $p = < 0.01$, trimester 2, $r = 0.748$, $p = < 0.01$, and trimester 3, $r = 0.760$, $p = < 0.01$. The only trimester scores that were, on their own, statistically significant were the third trimester scores with an $F = 6.41$, $p < 0.05$. Negative correlations to PANCE success were increased age, and military direct health care jobs. There were not enough female subjects in this study for significance and the first and second trimester scores were too variable to have significance on their own. Clinical experience scores had a low correlation to PANCE results (Oakes et al., 1999).

The NCCPA took a look at the PANCE in 2004 to determine how physician assistants in different specialties did on the PANCE and the recertification exam, the Physician Assistant National Recertification Examination (PANRE). Physician assistants in different specialties performed similarly in the different areas of the PANRE compared to physician assistants who were

generalists. Scores on the PANCE correlated well to scores on the PANRE according to the study ($r = 0.56$). This study, according to the authors, showed that physician assistants across specialties performed equally as well on the PANRE, and these scores correlated with the initial PANCE exam (Hess & Subhiyah, 2004).

Finally, as an earlier summation, an editorial by Cawley (2002) stated that the NCCPA PANCE had become a “primary defacto measure of PA program effectiveness” (p. 79) and is affected by variability of physician assistant program characteristics and the type of degree awarded. The type of degree awarded has been changing steadily over the last several years with more programs awarding physician assistant degrees at a master’s level.

Job Prospects

During its almost 40 year history, the physician assistant profession has enjoyed a comfortable starting salary. New graduates’ salaries since the year 2000 A.D. have increased by \$9000.00 annually for male graduates and \$10,000.00 annually for female graduates. Salaries for male graduates rose from an average of \$74,730.77 in 2000 to \$83,750.00 in 2007. During the same period, salaries for female graduates increased from \$62,515.34 to \$72,724.14. Salaries took an interesting jump in the year 2003 for both groups, but decreased the following year for both male and female new graduates. The specialty with the lowest average starting salary was family medicine, while the surgical specialties commanded the highest average starting salary (Snyder et al., 2008). Since its beginnings in the middle of the 1960’s, the physician assistant

profession had become mostly female by the year 2000. Female physician assistants made up 52.6% of practicing physician assistants (Larson & Hart, 2007). It changed from the male dominated ex-corpsmen cadre of students during the early days of the profession.

Physician assistants were a new profession during the 1960s and were educated on the philosophy of practice in rural and underserved areas (Cawley, 2002). Acceptance increased in the 1980s and 1990s as the role of the profession expanded to prescriptive authority in most states, as well as medical specialty practice. Surgical subspecialty practice soon followed, further expanding the role of physician assistants and increasing job variety and prospects (Larson & Hart, 2007).

Beginning in the middle of the 1960's and continuing through the following decades, the role of physician assistants became more clearly defined through the efforts of several national agencies. The agencies involved in this task were the National Board of Medical Examiners (NBME), the American Academy of Physician Assistants (AAPA), to finally the National Commission on Certification of Physician Assistants (NCCPA). The roles further defined, and acceptance ongoing, physician assistant teaching programs increased to 159 today (PAEA, 2011), with a resultant increase in graduates. Physician assistant educational philosophy has remained focused on providing medical care providers for rural and medically underserved areas (Cawley, 2002).

Several years ago, the American Academy of Family Medicine (AAFP) took on a collaborative project that stated that family medicine and the primary

care specialties have had less growth than the subspecialties. Their view for the future included a team approach to primary care medicine that included non-physician health care providers, naming physician assistants. This view of the future was followed by the note that in the six years from 1997 to 2003, family medicine had a 50% drop in medical students choosing that specialty (Family Medicine Project, 2004). In 2008, Health Affairs journal predicted that between 2005 to 2025, family medicine and family medicine workloads will increase by 29% while pediatric workloads will increase by 13% as the supply of primary care physicians increases only 7% in the best case and 2% in the worst case (Colwill et al., 2008). Finally, the Journal of the American Medical Association (JAMA) stated in 2008, “the presence and support of a robust primary care system is a major characteristic of an efficient and high-quality health care delivery” (Barr, 2008, p 834). This same commentary also noted that more physicians were leaving primary internal medicine faster than physicians with a subspecialty.

Methods

In researching the description of the construct of the study, Gall, Borg, and Gall (1996) described *positivist research* as the social reality being constant “across time and settings” (p. 28). Using previously collected data in retrospection would fit this description. The relationship between the earlier earning of an associate degree and success in physician assistant education will be done in a correlational or causal-comparative manner to be determined at data collection (Borg et al, 1996). Variables were determined according to Mertler and Charles’s definition and descriptions of *discreet* and *dichotomous*

(Mertler & Charles, 2008) as well as the categories of *independent* and *dependent* described in the same passage.

Further study created a decision point. To name *correlational* as the type of study, an associate degree in health sciences must be designated as the independent variable with the measures of success (PACKRAT, graduation, and PANCE) as the dependent variables. The second arm of the decision would be if the study were named as a causal-comparative study with the associate degree in health sciences designated as a preexisting condition (Mertler & Charles, 2008).

All data will come from a retrospective records review of students in the Nova Southeastern University Physician Assistant program and therefore will be from primary data. The data will come from the application process to physician assistant programs, the Central Application System for Physician Assistants (CASPA), the NSU supplemental application, the two PACKRAT scores taken during matriculation, and the PANCE pass rate. This data is compiled by the NSU programs and kept as part of the student's education record in the Enrollment and Processing System (EPS). This information is searchable through a module in the system called "Netsearch". Information is kept as scanned documents of the student's applications, both from CASPA and the Nova Southeastern University's own supplemental application.

Local data and records are being used as opposed to some more formal student tracking systems, like the National Student Clearinghouse (NSC), the Florida Education and Training Placement Information Program (FITPIP), or the

National Center for Education Statistics (NCES). These choices were borne out by articles by Hagedorn and Kress in 2008, Pfeiffer and Windham in 2008, and Shoenecker and Reeves in 2008. These three articles spelled out some of the limitations for using standardized databases as opposed to using transcripts and application data. The transcripts and applications were not subject to interpretation, did not exclude anyone who did not have certain identification documents, or took a non-traditional path through the education system (Hagedorn & Kress, 2008; Pfeiffer & Windham, 2008; Schoenecker & Reeves, 2008).

Chapter 3

Methods

The number of applicants for each seat in existing physician assistant programs exceeds the number of available seats. Finding information that prospective physician assistant students list on their applications may give a clue to their success rates in the physician assistant program and will be a valuable tool in admission decisions.

The CASPA centralized application process gathers student information so that physician assistant programs can evaluate applicants using multiple characteristics. Several studies have tried to show the categories that have correlated positively with success in the programs, but there has been no single category that has defined success and very few studies have attempted to correlate associate degree completion to successful physician assistant program completion.

This study was a records review and was done using the positivist paradigm, selected because the data represents “reality” that holds true in different settings as well as longitudinally according to time. The data in place are application documents and was a retrospective review of student records (Borg et al., 1996). The end result was to be better able to select physician assistant candidates with the best chance of successfully completing a program

of study. The design used data gathering from application documents as a quantitative study (Tashakkori, 1998; Tashakkori, 2003). There is not a qualitative segment.

Research Design

General approach. The basic experimental approach was an evaluation of the application data of students accepted into the physician assistant program during the three years of the study. Application data came from the CASPA applications and the NSU supplemental applications. Using application data provides essentially a “first person” set of data without the filter of gathering data from any of the preexisting databases (Hagedorn, 2008).

The second part was the study of the student’s records of matriculation during the program. This portion of the analysis provided the necessary data to compare the two groups’ scores on the PACKRAT and carried to the logical conclusion, the graduation rates of the two groups. Finally, the NCCPA provided the first time pass rates for the students taking the PANCE after graduation. All physician assistant programs are required to track and post the PANCE completion rates for their students. These data gathering items by the NSU programs make the Enrollment Processing System (EPS) the primary data source for the needs of this study.

This study was a comparison of the measures of success of the NSU physician assistant students in the two study categories. The measures of program completion were graduation with successful completion of the master’s

degree program. The performance measurement was the two standardized test scores, the PACKRAT and the PANCE exams.

Completion of the program is a dichotomous variable in that the student either graduated with a master's degree or not. Graduation must have been at the same time as the rest of the members of the class, without delays or reentry after dropout. The PACKRAT exam is a score that is a continuous variable and is compared to a national mean. There is no passing or failing of the PACKRAT, only a comparison to others who had taken it at the same testing cycle. Scores on this test have been shown to correlate to how well the students do on the PANCE (Cody et al., 2004). The PANCE is a combination of a dichotomous and a continuous variable. The PANCE scores are given as a number correct on the 600-question exam. The test taker's score is the number of questions correctly answered. However, there is a cutoff score for this exam that defines which physician assistant program graduates are certified and which are not. Scores on the PANCE are also given as a percentile of all those taking the PANCE during the same testing cycle.

Comparative analysis was used to determine if differences in the three items measured were statistically equivalent or not. Statistical comparisons like the chi-square, t-test, or possibly a Wilcoxon ranked sum test (Stevens, 1999) were all possibilities for analyzing the similarities and differences between the two groups. The choices for this study were the arithmetic mean for each group's scores on the PACKRAT and PANCE exams. Since these scores are a continuous variable, the chi-square and the t-test were the primary statistical

evaluations done on the data collected for these two variables. If the curves are skewed enough that the t-test is not valid, then the Wilcoxon ranked sum test is used. After the data were collected, the decision to use the t-test or Wilcoxon ranked sum was made. Finally, the PANCE scores are not only continuous, but the NCCPA has a minimum score needed to pass. The number of students passing from each group is analyzed as dichotomous variables. Initially these were compared using a simple percentage. Then a chi-square procedure was the primary plan. The p – value was kept a 0.05 for the entire calculation.

Graduation rates were compared in the same manner as the PANCE scores. The same statistical procedures were used as for those who pass the PANCE. Again, a p – value of 0.05 was used and a chi-square was performed. Membership in either group was determined upon analysis of the application data as students were categorized by their past education. The attainment of a two-year degree in the health sciences was used as the group determinant.

Population and sample. The students matriculating during the study years provided 384 subjects; this approximated the 450 total subjects projected at the onset. The students accepted into the NSU program must have completed both a CASPA application and a supplemental application to be considered for admission. The CASPA application was the primary tool because CASPA is a national standard used by a great majority of physician assistant programs (Rubak et al., 2007). As of 2006, 132 programs used CASPA as their application portal; while in 2010 over 90% of the 150 entry level physician assistant programs use CASPA as their application service. The number of programs

using CASPA will make future comparative analyses much easier and more standard. The CASPA application is very complete in information useful for this study. The NSU supplemental application requires some additional demographic and scholastic information that were added to the choices of information gathered for this study. Together, the two applications yielded all necessary data for the portion of the study dependent on applicant characteristics.

The CASPA categories were found in an application filled out by the researcher and printed as each section was completed. The supplemental Nova Southeastern University application was included for completeness and should aid future studies that might encounter an institution specific additional application. Samples of each application were added to the document as attachments or appendices.

The major category used to sort the groups was academic information. The major division was the group that has previously earned an associate degree in health science then a baccalaureate degree compared to the group that had not, but transferred from a community college or went to a four-year college and attained a baccalaureate degree as their initial post-secondary degree. Other divisions were the other academic and demographic information found on each subject's application file. Since the investigation looked for a causal relationship between these associate degrees in the health sciences and success, the associate degree in the health sciences was named the independent variable for this study. Success in the program and performance on the two landmark standardized tests were used as the dependent variables. The PACKRAT and

the PANCE exam, the standardized tests, were named the dependent variable (Mertler & Charles, 2008). After the applications were examined, the total number of subjects was 435; 51 in the group with health science associate degrees and 384 in the group with no associate degree in the health sciences.

Preexisting data sets from Nova Southeastern University's physician assistant programs were used. The sets used were the admission data from the CASPA and the supplemental applications from the classes of 2007, 2008, and 2009. The information contained in these data sets was the usual demographics as well as a detailed education history containing all degrees earned. There is also a comprehensive employment history that covers employment and volunteer work from secondary schools until the time the student is accepted into the physician assistant program. This isolated the subset of the population who started at a community college attaining an associate degree or a technical certificate (A.S. or A.A.S) in health science.

The performance of the students who have earned health science associate degrees was compared to the performance of the students who have a baccalaureate degree without any associate degree or after an A.A. degree. The applicant information was found in the Nova Southeastern University's Enrollment Processing System (EPS) within the "NetSearch" database. For each applicant who has matriculated in the NSU programs, both the CASPA and the NSU supplemental application are in the database as individually scanned documents for each applicant and each application. This information is stored locally as raw data. Therefore, it is not subject to the limitations encountered

when using a standardized or externally created database. All students accepted into the program can be counted and used as subjects. Using the “raw” or “first person” data source does not subject the data to limitations of already gathered or screened data and the researcher is not forced to omit the students who, for example, did not have social security numbers, transferred from another state, or came into the university in an unexpected way (Hagedorn, 2008).

Participants for this study. The programs that were accredited at NSU during these times were based at the main campus in Fort Lauderdale, Florida. The second program based at its inception in Naples, Florida, has subsequently moved to a permanent building in Fort Meyers, Florida, and the third is located in Orlando, Florida. All three programs are individually accredited by both the regional education accreditation body, the Southern Association of Colleges and Schools (SACS), as well as the Association for Reoccurring Accreditation of Physician Assistant Programs (ARC-PA). The fourth program, at Jacksonville, Florida has recently seated its first class and will not have a class graduating until August, 2011.

The population for this study is students who were accepted into the study year graduating classes. All students accepted into any Nova Southeastern University physician assistant programs during the study years, were subjects for this study. Information used as study data were taken directly from the applicants’ scanned documents. Student attrition was defined as students who did not perform to the program standards and removed from the program, or students who self-disenrolled for any reason. As an event, there should have

been the same percentage from each group who withdrew from the program and the effect on power should have been the same for each group.

Completion of the health science associate degree or not was the independent variable assigning the subjects to each group. Group one (1) was designated as the NSU physician assistant program applicants accepted into the programs who completed a health science associate degree at some time during their post-secondary education. Group two (2) was designated as the students who were accepted into the NSU physician assistant programs after completing an associate of arts degree for transfer, or completed a four-year degree only during their post-secondary education.

The study subjects were part of a larger subset of applicants for the over 250 seats available annually in Nova Southeastern University's four physician assistant programs. Each individual program sets application criteria for its own program. Each is similar with a few differences. Differences include minimum grade point average (GPA) and the level of some courses. The difference in the GPA requirements for the programs is that two of the programs use 2.9 on a 4.0 grade scale for their lower cutoff and the other program uses 2.8 on a 4.0 grade scale. Since the average GPA of the class in all three programs is over 3.1, these differences are thought not to affect the study appreciably. Differences in the prerequisite courses accepted for each program are determined by the admissions coordinator for that particular program. The amount of statistics credits is slightly different, and two of the programs have a genetics requirement. These differences in prerequisite programs, in all probability, would be distributed

evenly throughout the population and, therefore, each sample. In that case, these differences should not skew the results.

This sampling strategy was selected because of data availability of the NSU enrollment processing system database and because the student subjects can be searched using one of the search filters built into the database application. The secondary consideration for this strategy was that the application data is stored as scanned forms and is not subject to any previous filtering or data paring by the university or the programs.

Instruments and instrumentation. No new instruments or forms have been created to conduct this study. The data used in this study was a review of data gathered by the CASPA application process and the Nova Southeastern University supplemental application. The availability and adequacy of already available data were sufficient to perform this study.

The data retrieval software is already in place as the EPS software used by the university admissions department. The benefit of using the system already in place is that it stores the data as scanned application pages for both the CASPA and the NSU supplemental application. The raw data from admissions was available for analysis. Using first person data included in the applications along with documents checked by the applicant and the admissions officer avoids the use of previously filtered or sorted data. Previously filtered or sorted data could have resulted in items or subjects being omitted inadvertently from the data set along with the data being tainted or skewed by earlier manipulation. Also advantageous in using raw admissions data is that all the

applications meet the inclusion criteria for this study without a prior screening process that could have omitted some of the possible subjects or criteria. These were all limitations using the Transfer and Retention of Urban Community College Students (TRUCCS) project, the Florida Education and Training Placement Information Program (FETPIP), or the National Student Clearinghouse (NSC) (Hagedorn & Kress, 2008; Pfeiffer & Windham, 2008; Schonecker & Reeves, 2008).

Permissions and institutional research board (IRB). The University of South Florida as well as the Nova Southeastern University Institutional Research Board's regulations and protocols were followed during this study. This study was done with approval of the Institutional Research Boards (IRB) of both universities involved. Information was gathered by several methods. These include but were not limited to audio and video broadcasts, tape or digital recording, internet, print, archives, data sets from states, regions, or national, meetings, reports, and interviews. This may also have included reports from individuals, institutions, committees, or state departments. Communication may have been by electronic communication, telephone contact, or written requests. Case studies were not used, therefore, editorial privilege over specific facts and citations contained in the case studies that may be violations of privacy or could do harm to the subjects or family members or friends did not apply. Proper permission for data sets and reports was acquired prior to data access.

Applications were submitted to the Institutional Research Boards of both the University of South Florida and Nova Southeastern University immediately

after proposal defense. The application to the Nova Southeastern University IRB was necessary, as the subject data were gathered from the physician assistant classes graduating in 2007, 2008, and 2009 were also submitted. Permission forms were sent to the officers of primary responsibility for each agency that collected the data. This included the office of the dean of the College of Allied Health and Nursing, along with the request for permission to the Enrollment Processing System for access to the NetSearch database.

Data collection procedures. Nova Southeastern University's Student Services Department grants permission and access to the Enrollment Processing System's (EPS) database. The documents needed for this study are housed in that database as scanned documents. The specific area of access within the EPS database is the section labeled NetSearch. Faculty, administration, and admissions personnel are granted access to this file in conjunction with their usual duties. However, this access is usually limited (with the exception of the admissions personnel) to the single program where the person is employed. Special permission and a specific need were required to access student records across all four programs.

The subsequent step was to sort the students who have been accepted into each program by graduation year. The documents attached to each student were studied and items critical to this study were pared from the files. The documents pared from the applications were the student name, I.D. number, education history, scores on the PACKRAT exam taken in the clinical year, the date their degrees were awarded, and the student's first time scores on the

PANCE exam. Student's names and education histories were found on the CASPA application and the NSU supplemental application. A unique I.D. number is assigned as the applicants complete their NSU supplemental application. This is assigned at the time the admissions office receives the completed application along with the application fee. This number was masked during the study to avoid any breeches of record privacy or compromise of the student's identity. The student's PACKRAT exam scores are kept by the programs and become part of the student record. Graduation dates and degree confirmations are awarded for each student. Students who were accepted into the program but do not have a graduation date and degree congruent with the rest of the class are counted as those not completing the program. The final data segment for the study is the first time scores on the PANCE and those scores are also kept for each student as these pass rates must be displayed on each program's website. This is a requirement of the ARC-PA accrediting body.

The six data items that were gathered were tabulated in a spreadsheet or data table format using traditional office suite applications. Microsoft Access® or Excel® are two such applications and have the capability to import lists of data from the EPS database. Once the data were tabulated, the identifying data for each student was masked and given a random identifier to comply with privacy requirements. All Family Educational Rights and Privacy Act (FERPA) regulations were followed. This format was the final product of the data gathering and tabulation.

In order to build a profile of the test population, demographic data were also gathered to further describe the subjects. These were planned to be age, gender, ethnicity, science GPA, and overall GPA. These data items were not used in the analysis, but were reported as raw numbers, percentages, or both as descriptors.

The researcher was the only data gatherer and did not require any additional data collection tools or personnel. The data were gathered as soon as proposal defense was finished and took place over approximately 30 days to complete the evaluations of all the applications and collate the variables. It was a single site study using Nova Southeastern University College of Allied Health and Nursing Physician Assistant programs as the only data source with the Nova Southeastern University NetSearch database.

Procedures and data analysis. Data analysis was done by comparing the success rates of the group who had completed a vocational associate degree at some point in their postsecondary education to the group who have never had such a degree. Correlations and comparisons were drawn between each of the two groups and each of the measures of success named above.

The independent variable upon which the study was based is whether or not the subject had a vocational associate degree in the health sciences, or not. Once the subjects were divided into two groups, the initial analysis was a comparison of these proportions analyzed using a chi-square test (Glass, 1996). Grades earned by the students during the physician assistant program, are not part of the data gathered and were not used in this study.

The number of students who successfully complete the program in each group was also compared as a simple percentage or ratio of those attempting the measures of success and those who successfully completed these. This was a correlational study between the group who had completed an associate degree in the health sciences, and those who never have and their respective measures of success. The measures of success are (a) graduation, (b) PACKRAT scores, and (c) passing rates on the national certifying PANCE exam. In comparing scores between the two groups on the two standardized tests given during the program, the statistical method used was a comparison of serial measurements between two groups. In this case, an *analysis of variance* or ANOVA of the scores gave the best measure of comparison and evaluation. For the national certifying examination, the PANCE, again a chi-square test gave the best measure of statistical significance. For the test scores on the PACRAT and PANCE, the analyses followed a simple t-test or ANOVA (Triola, 2001) if the distribution were normal. If the distributions, however, are skewed, a Wilcoxon Rank-Sum Test for independent samples (Triola, 2001) was used for the analysis. Either of these methods could have been used depending on the distribution of the data and was decided upon after initial data gathering.

There was no more than a minimal risk to any of the participants and no participant had any time commitment. No individual student information was released. Therefore, the chance for emotional harm, breach of confidentiality, or privacy was almost non-existent except for an accidental disclosure for which precautions are in place. Again, not releasing individual information eliminates

psychological and emotional pain to the participant. No part of this study involved loss of subject time or pay (NSU IRB Application, 2009). The total number of subjects matriculating in the program during these three classes was estimated to be approximately 450 students. The actual number was 435 subjects. Data were masked and gathered from a secure server site. Findings are only reported in aggregate and the name of the university was designated as a private university physician assistant program in Florida. No student's names were used at all in the process. Other identifying information, such as student numbers, addresses, state of licensure, or medical practice location, was not used. The three programs involved are in different locations, but were not reported on separately. Since this is a record review, no subject was compensated nor given incentives. Studies done by records review negated the need for consent forms and a consent procedure to be created. The entire student subject body has graduated and permission or consent was not required. No subjects are minors.

Data were secured during electronic storage on Nova Southeastern University's secure servers with current secure socket layer (SSL) certificates in place and access to a virtual private network, creating a secure data repository. Any printed or other non-electronic data are stored in an office with a locked door and in a locked file cabinet. The student education center where any paper copies are stored has twenty-four hour on-site security guards.

The other measures of success in the program were the performance of the students in the comprehensive exam given during the program. This is the

PACRAT exam and is a measure of the general medical knowledge of each student. The PACKRAT is considered a preparatory exam for the national certifying exam, the PANCE from the NCCPA. In the Nova Southeastern University programs, the PACRAT is given once during the didactic year and once during the clinical year during one of the programs. In two others, it is only given during the clinical year. Therefore, for this study, only the PACRAT given during the clinical year was used as a data set. Since the computer interface architecture is the same for the Nova Southeastern University on-line testing as for the PACKRAT and PANCE, the students taking the PACKRAT twice gain no advantage.

Another measure of success, the PANCE, is the national certifying exam that, along with graduating from an accredited physician assistant program, qualifies the prospective physician assistant to apply for a license in every state. The respective physician assistant programs track the first time scores for this exam. The scores on these two exams were compared between the groups as a measure of success.

One other important resource used in the study is the Enrollment Processing System / NetSearch (EPS/NS). This is the repository for all the application data for the students who have applied to the Physician Assistant Programs of the Nova Southeastern University. Data are stored for each applicant as scanned data sheets for each page of the prospective student's application packet.

This study followed student's progress from their application to physician assistant programs to graduation from the physician assistant program. Graduation from the master's degree physician assistant program was the endpoint determining success in the program. The scores on the PACRAT and PANCE standardized tests were also measures of success for the subjects. PACKRAT scores were used as an intermediate endpoint while the final endpoint was passing the PANCE exam.

Quantitative analysis. The comparison and data analysis were undertaken using off the shelf statistical software similar to but not necessarily the Statistical Package for the Social Sciences or SPSS. The comparisons used were a chi-square test, t-test, possibly logistic regression, and a Wilcoxon ranked sum test. From a preliminary look at the situation, this researcher was unable to predict the direction of the effect. Therefore, the p-value for a two-tailed test was used (Stevens, 1999).

The comparisons were assessed using a variation of the Tukey procedure for unequal sample sizes by a formula substitution described the Tukey - Kramer procedure (Stevens, 1999). This method compares multiple data sets of unequal sample size. That being the case, an effect size of .50 is a good outcome as it would be the smallest effect that would give a result detectable by the researcher (Stevens, 1999). The use of this effect size was developed by Cohen and recalled in several articles to add the appropriate validity to the study (Onwuegbuzie, 2003). This seemed best suited to a *latent effect* size determination for the qualitative portion (Tashakkori, 2003). The average power

value used and accepted for most studies was 0.8. This was used to determine the necessary sample size initially. However, with a subject population of 435 the power value manifested as acceptable (Stevens, 1999).

Reliability and validity. Possible breaches of validity include several possibilities. One such possibility is incomplete sample collection during the data collection phase of the study. Inaccurate tabulation during the specific categorical information gathering can also create inaccuracy. Students who have had to repeat portions of the program may not be included in the graduation data if they do not graduate by the 2008 graduation date. However, using the raw application data eliminates many threats to reliability and validity as the information used as the data source is constant and has not been filtered or otherwise interpreted in any way that might decrease the reliability or the validity of the source data.

Since the application documents for each student are the data source, the data gathering was as accurate as the gatherer. The data were blinded as to not violate any of the Family Educational Rights and Privacy Act (FERPA) or the Health Insurance Portability and Accountability Act (HIPAA) laws and errors may creep in during the assigning of random numbers to the student subjects to blind their names. A possible reliability threat would be if the CASPA data input were erroneous. This is unlikely since both the admissions department and the applicant are able to see the application after submission. Under these conditions, any corrections needed would likely be discovered by the applicant, and any irregularities once the application reached the admissions department

should be flagged and asked for correction by the admissions personnel. The researcher feels that these are very uncommon occurrences and should not have a significantly diminishing effect on the validity and reliability of the input data. Scanned copies of the application documents were used for the data gathering. Therefore any clerical errors or typographical errors in the CASPA application processing could manifest. The documents have also been scanned into the NetSearch database and again, any input errors may surface. In each of the prior two cases, the most common error would seem to be a document out of place. Since this did not occur, no subjects needed corrected or dropped from the study. If an entire application, both CASPA and the NSU supplemental application, was erroneously submitted, then that subject would have certainly been dropped from the study (Tashakkori, 1998). This did not occur and all subjects were included.

Grades earned during the program were not included as these were not associated with previous associate degrees and could act as confounders if the associate degree in the health sciences is also found to be an indicator of higher grades in the physician assistant program (R. Roetzheim, personal communication, October 24, 2009). Also, according to Dr. Roetzheim, the data analysis for the major questions was kept as simple as possible so that interfering factors are limited. To complete data analysis, further statistical procedures may be run on the data to detect interference from other data bits gathered incidentally and these may have more of a tendency to be unreliable.

Chapter 4

Results

Overview of Findings

This study was conducted to determine what effect adding another criterion to student selection could have on student success in physician assistant programs. Will applicants to the physician assistant programs who had earned an associate degree in the health sciences would outperform those who had no associate degree in the health sciences using the following milestones of success; graduation rates, the standardized test (PACKRAT), and performance on the national certifying exam taken after graduation. This study was unique, using only data from the prospective students' application packages as variables. Efficient selection adds benefit to both students and the institution. Better selection procedures will enhance the applicant selection process for physician assistant programs.

Site Description

The site for this study is a not-for-profit research university in the southeastern United States comprised of fourteen colleges and schools. There is an enrollment of over 27,000 students, approximately one-half of whom are part time. The physician assistant program is part of the College of Allied Health and Nursing. The three physician assistant programs studied were accredited in

1993, 2005, and 2007 by the Accreditation Review Commission on Education for the Physician Assistant (ARC-PA). Physician assistants are awarded a masters degree in Health Science for Nova Southeastern University accredited by the Southern Association of Colleges and Schools (SACS). Each physician assistant program in this study has been in continuous operation since its inception without a loss of accreditation.

The programs studied for this project were three of the ten physician assistant programs currently active in Florida. The students studied were those who were accepted in the classes for graduation years 2007 through 2009. Class size ranged from 40 to 90 depending on the program and year of acceptance. The study had a total study population of 435 subjects. It was noted that two of the cohorts studied were the first classes who had gone through two of the programs.

Data Collection and Processing

After the successful proposal defense, the application to each of the university's Institutional Review Boards (IRB) was submitted and approved. The subject university's enrollment processing system (EPS), stores scanned copies of each subject's original documents from the Centralized Application System for Physician Assistants (CASPA) and the university specific supplemental application. Therefore, they are a first person account of each application. The data were secured by a virtual private network with a password protected computer and removable media. Data transfer was done by a portable flash

memory drive kept in the presence of the researcher or in a locked office. All data were gathered and extracted by the author alone.

The following demographic data were extracted from the enrollment processing database. Subjects were identified by name, graduation year, and university identification number. Additional demographic data gathered at this time included age, gender, ethnicity, grade point average (GPA) in science and overall course work, Graduate Record Exam (GRE) scores, and evidence that the subject had an associate of science degree in the health sciences. The following data for the dependent variables were collected from the program directors and the associate dean: graduation rates, scores on the Physician Assistant Comprehensive Knowledge Rating Assessment Test (PACKRAT), the Physician Assistant National Certification Exam (PANCE) score, and the PANCE first time pass rate.

After the collation and data matching, the subjects from each program and year group were sorted by overall grade point average and assigned a study number. The student names and identification numbers were deleted and the students were given study numbers allowing each subject to be matched to their graduation year and program but not associated with subjects' age, name, and student number. Prior to assigning study numbers, the students were scrambled according to PANCE scores removing any alphabetical order to create the study sample population. This technique masked the data to avoid inadvertent release of sensitive student information. Next, all the year and program groups were placed on a single spreadsheet and sorted again by whether or not they had

completed an associate degree in the health sciences to finally organize the data set for analysis.

Population Descriptions

Total study population data. The total study population of 435 subjects included graduation years 2007 to 2009 from the three sites active at that time, including the two cohorts who were the first class through the program at two of those sites. The independent variable, an associate of science degree in the health sciences, divided the study population into two study groups. Those having an associate degree in the health sciences were considered as one group and those who did not have an associate degree in the health sciences comprised the second group. Data occurring before matriculation applied to every study subject and was compiled. Students who did not graduate, or take the PACKRAT or the PANCE, left data omissions for those items.

Data sets gathered as student information prior to matriculation are (a) whether or not the subject graduated, (b) if they have an associate degree in the health sciences, (c) age, (d) gender, (e) ethnicity, (f) science GPA, (g) overall GPA, and (h) GRE scores. Only one number was missing from the science GPA category while three were missing from the GRE category. These missing data points brought the number of subjects in these two categories to 434 and 432 respectively. These missing data are explained by the following. One student did his or her undergraduate postsecondary education in another country had only an overall GPA instead of both a science and overall GPA posted in their CASPA data. Secondly, not all the GRE scores were posted on the older

applications, and without contacting the students these data were not recoverable. Search of all the scanned documents contained in the student's file did not reveal these missing GRE scores. Therefore, three GRE scores were not available for the study. The programs do not keep the printed copies of the application data once a student begins the program and all archival admission data are in the enrollment processing system database. Other than these exceptions, each of the remaining 435 subjects had all of the items that were in place prior to matriculation.

Data sets that evidenced each subject's success in the different aspects of the program had more variability. Program completion rates for the subjects were complete and the total was 435 subjects who either graduated or did not. Not all students took the standardized tests, the PACKRAT and PANCE, and tabulating the missing data showed 415 subjects had a PACKRAT score and 410 had a PANCE score. Some subjects did not take the PACKRAT, but took the PANCE. This variability could be attributed to the circumstances leading to PACKRAT testing and the PANCE exam. The PACKRAT is given on only one day near the end of the clinical year. If a student is absent, and does not take the PACKRAT, there is no chance for a make-up exam. Absences could be attributed to any reason that might take a student out of class and may include illness, personal or family emergencies, or prior commitments. The PANCE is given only in two cycles during the year. Students who did not take the PANCE during the first testing cycle after graduation were not in the list of scores or pass/fail tables gathered from the programs. Subsequent PANCE attempts, or

taking the PANCE after the first testing cycle after graduation, were not counted and showed as a datum omission. There were a lower number of subjects who took the PANCE than took the PACKRAT. Taking the PANCE is left entirely to the subject, while the PACKRAT is given in the controlled situation of the clinical year of physician assistant education. Students who did not finish the program would likewise not be included in the PANCE scores. Data omissions in the areas of PACKRAT scores, PANCE scores, and the PANCE pass/fail sections are explained by looking at the numbers of subjects in the raw data categories.

Table 4.1 – Total numbers in each data set.

Data Description	Tot. Study Pop.	Group with A.S.	Group w/o A.S.
Number	435	51	384
Age	435	51	384
Gender	435	51	384
Ethnicity	435	51	384
Science GPA	434	51	383
Overall GPA	435	51	384
Graduation No.	435	51	384
PACKRAT Sc.	415	47	368
PANCE Sc.	410	47	363
PANCE P/F	410	47	363

In summary, the students who did not graduate from each group were included in the descriptive statistics of the study; age, ethnicity, education history, GPA in science and overall, and GRE scores. Those who did not finish the course of study left holes in the subsequent data sets of PACKRAT scores, PANCE scores, and PANCE pass rates. Omissions were considered to be small and randomly distributed across the population and were not considered. These “holes” in the data manifested as a different number of subjects (N) in the affected data sets.

Group Descriptions

Data descriptions. Data sets were formed from the study population and the final product was discussed as three groups. The first group discussed is the entire study population, defining the demographics and descriptive statistics of the entire study cadre. Students who earned an associate degree in the health sciences comprised the smaller of the two comparison groups. Students without an associate degree in the health sciences are the final group discussed and comprised the largest of the two comparison groups.

Total study population data. The study population was comprised of 435 subjects who graduated from 2007 to 2009 from the three programs then in existence. The initial ethnic classification was taken from the Area Health Education Centers (AHEC) questionnaires used for tabulation of student housing. This classification has eight categories, White, Black, Native American, Asian/Pacific Islander, Hispanic, Other, and Undeclared. Two subjects who did not declare their ethnicity were included in the Other group along with Native

Americans, Asian/Pacific Islanders and the subjects who described themselves as Other. Several of the eight groups were small; therefore, combining some similar groups gave a larger number of subjects in each of the remaining groups. The revised group list categories are White, Black, Hispanic, and Other. The ethnic distribution was described using the same four groups as above, White, Black, Hispanic, and Other. The four groups as follows were, 300 (69.0%) White, 27 (6.2%) Black, 56 (12.9%) Latino/Hispanic, and 52 (12.0%) Other. The study population gender distribution was 331 (76.1%) females and 104 (23.9%) males.

Table 4.2 - Ethnic and gender breakdown.

Category	Number (N)	Percent %
Female	331	76.1 %
Male	104	23.9 %
White	300	69.0 %
Black	27	6.2 %
Latino/Hispanic	56	12.9 %
Other	52	12.0 %

The average age was 25.70 with a range of 33 years (min. = 20, max. = 53), a median of 24 years, a mode of 23 years, and a standard deviation of 5.45. Overall GPA mean was 3.32, range was 2.45 - 4.00, the median was 3.32, the mode was 3.32, and the standard deviation was 2.91. Science GPA mean was

3.21, the range was 2.22 - 4.00, the median was 3.19, the mode was 2.80, and the standard deviation was 0.340.

Of the total study population, 420 (96.6%) completed the program and fifteen (3.4%) did not. As the independent variable, the group with an associate degree in the health sciences numbered fifty-one (11.7%) and the group without associate degrees in the health sciences numbered 384 (88.3%).

Table 4.3 – Total population description of continuous variables.

Data Item	Mean	Range	Range	Median	Mode	S.D.
Age (Yrs.)	25.70	33	20 – 53	24	23	5.45
GPA (OvrA)	3.32	1.55	2.45-4.00	3.32	3.32	2.91
GPA (Sci)	3.21	1.78	2.22-4.00	3.19	2.80	0.34

Those with an associate degree in the health sciences data. The composition of the group with associate degrees in the health sciences was fifty-one subjects. The ethnic distribution was described using the groups White, Black, Hispanic, and Other. The analysis showed 30 (58.8%) of the subjects were White, five (9.8%) of the subjects were Black, eight (15.7%) of the subjects were Latino/Hispanic, and the combined group described as Other totaled eight (15.7%) of the entire study population. The gender distribution in this group was thirty-four (66.7%) females and seventeen (33.3%) males.

The average age was 27.67 years with a range of 22 years, a median of 27.00 years, and a mode of 23 years. The science GPA averaged 3.20 points

with a range of 1.59 points. The median science GPA was 3.17 points, and the mode was 2.78 points. Overall GPA showed a mean of 3.26 points, with a range of 1.48 points, and a median and mode of 3.29 points and 2.86 points, respectively. The standard deviation for age was 5.22 years, science GPA 0.37

Table 4.4 – Subjects with A.S. /A.A.S. in the health sciences, description of variables.

Continuous.

Data Item	Mean	Range	Range	Median	Mode	S.D.
Age (Yrs.)	27.67	22	21 – 43	27.00	23	5.22
GPA (OvrA)	3.26	1.48	2.45 – 3.93	3.29	2.86	0.33
GPA (Sci)	3.20	1.59	2.30 – 3.89	3.17	2.78	0.37

Categorical.

Data Item				
Gender	Female	Male		
	34 (66.7%)	17 (33.3%)		
Ethnicity	White	Black	Latino/Hispanic	Other
	30 (58.8%)	5 (9.8%)	8 (15.7%)	8 (15.7%)

points, and overall GPA 0.33 points. This was the group with the smallest number of subjects, having 51 at onset. The group without associate degrees

was comprised of the difference between the total number of subjects and the group with associate of science degrees.

Those without an associate degree in the health sciences data. The group without associate degrees in the health sciences was the second largest group containing 384 subjects. The four ethnic groups were; White, Black, Hispanic/Latino, and Other. The ethnic distribution was 270 white (70.3%), 22 black (5.7%), 48 Hispanic (12.5%), and 44 others (11.5%). The gender distribution was 297 (77.3%) females and 87 (22.7%) males. The average age was 25.44 years, the range was 33 years, the median was 23.00 years, the mode was 23 years and the standard deviation was 5.43 years. The science GPA averaged 3.21 points, and the range was 1.78 points, the median was 3.19 points, the mode was 2.80 points, and the standard deviation was 3.36 points. Overall GPA mean was 3.33 points, range was 1.47 points, median was 3.32 points, mode was 3.32 points and the standard deviation was 2.85 points. The graduation rates, PACKRAT scores, PANCE scores and pass rates for each of the two study groups were compared to answer the research questions.

Graduation rates. Question 1 – Will physician assistant students who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science, A.A.S.) in the health sciences have statistically similar program completion rates as students who did not have such a degree?

Hypothesis 1 – Physician assistant students who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science,

A.A.S.) in the health sciences will have statistically better program completion rates than students who did not have such a degree.

Table 4.5 – Subjects without A.S. /A.A.S in the health sciences descriptive variables.

Continuous.

Data Item	Mean	Range	Range	Median	Mode	S.D.
Age (Yrs.)	25.4	33	20 – 53	23.00	23	5.43
GPA (OvrA)	3.33	1.47	2.53 – 4.00	3.32	3.32	0.29
GPA (Sci)	3.21	1.78	2.22 – 4.00	3.19	2.80	0.34

Categorical.

Data Item				
Gender	Female	Male		
	297 (77.3%)	87 (22.7%)		
Ethnicity	White	Black	Latino/Hispanic	Other
	30 (58.8%)	5 (9.8%)	8 (15.7%)	8 (15.7%)

The entire study population of 435 was included in this sample. In the two groups separated by the independent variable, the group who had an associate degree in the health sciences had a total of 51 subjects and the group without an associate degree in the health sciences contained 384 subjects. In the group with associate degrees in the health sciences, three (5.88 %) did not graduate

while 49 (96.1%) graduated. The group without an associate degree in the health sciences contained 384 subjects. Twelve (3.1%) did not graduate and 372 (96.9%) graduated. Comparing the two groups with a Peterson chi-square showed a value of 0.956 and a two-sided asymptotic significance of 0.328, not falling into the ninety-five percent confidence limit.

PACKRAT scores. Question 2 - Will physician assistant students who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science, A.A.S.) in health sciences have statistically similar scores on a standardized test, the Physician Assistant Clinical Knowledge Rating and Assessment Tool (PACKRAT), than those who have no associate degree in health science?

Hypothesis 2 - Physician assistant students who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science, A.A.S.) in health sciences will have statistically better scores on the standardized test, the Physician Assistant Clinical Knowledge Rating and Assessment Tool (PACKRAT).

Only PACKRAT results from the testing done in the clinical year were used in this study. Some of the subjects took the PACKRAT twice, once in their didactic year and once in their clinical year but scores earned by students in the didactic year were not used. Of the subjects who remained in the program and were present for the clinical year PACKRAT, 415 took the exam. Exam scores for the population showed a mean of 140.62 points, a median of 140.00 points, a mode of 134 points, and a range of 99 points (86-185). The standard deviation

was 18.63 with a bell shaped distribution curve. Forty-eight subjects who had an associate of science degree in the health sciences took the PACKRAT. This group had a mean of 136.51 points, a median of 134.00 points, a mode of 140 points, and a range of 75 points (101-176). Three hundred and sixty-seven subjects who did not have associate of science degree in the health sciences took the PACKRAT. The group had a mean of 141.14 points, a median of 141.00 points, a mode of 141 points, and a range of 99 points (86 - 185). Comparison of the two study groups with an independent samples t-test assuming equality of variances, showed a t-value of -1.674, a significance value of 0.095 at the 95% confidence level, a mean difference of -4.776, with a 2.853 standard error of difference. Unlike the PANCE exam that has a pass/fail cutoff score (350 points), there is no pass/fail cutoff with the PACKRAT scores.

PANCE scores. Question 3 - Will physician assistant program graduates who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science, A.A.S.) in health sciences have statistically similar scores on a standardized test, the Physician Assistant National Certifying Examination (PANCE), given to physician assistant students before they are eligible to apply for licensure?

Hypothesis 3 - Physician assistant program graduates who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science, A.A.S.) in health science will have a statistically better score on the standardized test, the Physician Assistant National Certifying Examination

(PANCE), given to physician assistant program graduates before they are eligible to apply for licensure.

The PANCE scores were unique in their cutoff value of pass or fail. The cutoff score was 350 points for this study population. PANCE score was a variable that had both properties of a continuous range and a bivariate category data set. The scores for the PANCE are a numerical continuous variable with a passing score of 350 points or above, making this aspect of the score a categorical variable. The data for each group were compared as a range of data and for the bivariate pass/fail aspect of the exam.

The PANCE was taken by 410 subjects during the first testing cycle. Some students who did not finish the program were not eligible for the exam and some of the graduates did not take the exam in the first testing cycle, excluding them from the results. The scores for the entire population showed a mean of 494.11 points, a median of 493.50 points, a mode of 464 points, a standard deviation of 113.20, a range of 657 points, with minimum and maximum scores of 200 and 857 points respectively.

The group with an associate degree in the health sciences totaled 47 subjects. Their mean PANCE score was 454.89 points, with a median of 459.00 points, a mode of 357 points, a standard deviation of 120.81 points, and a range of 504 points (239 – 743). The group without an associate degree in the health sciences totaled 363 subjects. The mean PANCE score in this group was 499.19 points with a median score of 498.00 points, a mode of 464 points, a standard deviation of 111.34 points, and a range of scores of 657 points (200 – 657). A t-

test was done comparing the mean scores of each study group as independent variables. The results of this data analysis assuming equal variance showed the difference was statistically significant with a p-value of 0.012 showing evidence the group with an associate degree in the health sciences did not perform as well on this measure of success as the group without the associate degree.

Similar results were found for the comparison of the PANCE pass/fail (350 point cutoff score) rates for the two groups. The group with an associate degree in the health sciences had a 76.6 % pass rate for the PANCE, while the group without an associate degree in the health sciences had a 90.1% pass rate. The pass/fail rate of the two study groups was compared using a Peterson's chi-square test (chi-square value = 7.506, p-value = 0.01, 95%CL) and showed a statistically significant difference.

The associate degree in the health sciences was not the only difference in the two groups. The other variables that showed difference were age, science grade point average, overall grade point average, and the sum of the verbal and quantitative GRE score. Of these items gathered as demographic data, comparison of means as independent samples showed statistical significance for two of the categories, age and GRE score. The other two, science and overall GPA did not show a statistically significant difference between the two groups.

The categories showing a statistically significant difference, age and GRE scores, were compared using a t-test for the two independent means of the subject groups. Analysis of the subject's age in the two groups showed the following. The group with associate degrees in the health sciences had a mean

age of 27.67 years, a median age of 27.00 years, a mode of 23 years, a standard deviation of 5.222 years, and a range of 22 years (21 – 42). The comparison group, those without an associate degree in the health sciences was the larger, and had a mean age of 25.44 years, a median age of 23.00 years a mode of 23 years, a standard deviation of 5.434 years, and a range of 33 years (20 – 53). Results of the comparison showed a t-value of 2.761, a p-value of 0.006 (95% CL) and a mean difference of 2.227.

The GRE scores were compared using a t-test to compare the means of each group. The group with an associate degree in the health sciences earned scores with a mean of 949.41 points, a median score of 940.00 points, a mode of 760 points, a standard deviation of 147.315 points and a range of 610 points (660 – 1270). The group without associate degrees in the health sciences had a mean score of 1006.04 points, a median score of 1020.00 points, a mode of 1070 points, a standard deviation of 147.433 points, and a range of 980 points (470 – 1450). Results of the comparison showed a t-value of -2.576, a p-value of 0.010 (95% CL) and a mean difference of -56.625.

A t-test for independent samples was used to compare the age and GRE scores of the two subject groups. The means of the ages of the two groups were 27.67 years for the group with the associate degree in the health sciences, and 25.44 years for the group without. The variances of each group were not equivalent with values of 27.27 and 29.53 respectively. Data analysis showed a t-value of 2.847 and a p-value of .002 showing a statistically significant difference between the two groups. The mean GRE score for the group with an associate

Table 4.6 – Subjects descriptive variable comparison.

Graduation rates	Graduated	Did Not Graduate	Total			
With A.S.	49 (96.1%)	3 (3.9%)	51			
Without A.S.	372 (96.9%)	12 (3.1%)	384			
Population	420 (96.6%)	15 (3.4%)	435			
PACKRAT Scores	No. of subjects	Mean	Median	Mode	S.D	Range
With A.S.	48	136.51	134.00	140	19.20	75 (101-176)
Without A.S.	367	141.14	141.00	134	18.52	99 (86-185)
Population	415	140.62	140.00	134	18.63	99 (86-185)
PANCE Scores	No. of subjects	Mean	Median	Mode	S.D	Range
With A.S.	47	454.89	459.00	357	120.81	504 (239-743)
Without A.S.	363	499.19	498.00	464	111.34	657 (200-857)
Population	410	494.11	493.50	464	113.20	657 (200-857)
PANCE Pass Rates	Passed	Did Not Pass	Total			
With A.S.	36 (76.6%)	11 (23.4%)	47			
Without A.S.	328 (90.1%)	36 (9.9%)	364			
Population	364 (88.6%)	47 (11.4%)	411			

degree in the health sciences 949.41 points and the mean score for those without was 1006.04 points. The variances of each group were equivalent at 21701.65 for the group with an associate degree in the health sciences and 21736.62 for the group without. These variances were equivalent resulting in a t-value of -2.576 and a p-value of .010 that showed a statistically significant difference in the means of the two groups.

Further analysis. Examining the comparisons between the two groups, the differences in the measures of success may not be explained using the independent variable only. Age and GRE scores demonstrated statistically significant differences when the two groups were compared, while the rest of the comparisons did not show significant differences. Therefore, a linear regression analysis was conducted in order to examine the effect of age and GRE scores, the dependent variables with statistically significant differences, on the measures of success used in this study. The measures used were completion rates, PACKRAT scores, and PANCE scores and pass rates. The associate degree in the health sciences was the independent variable used for the linear regression.

The defining objective in all physician assistant programs is passing the PANCE. Scores on the PANCE were chosen as the measure of success that lent itself to analysis of the effects of the statistically significant dependent variables. The linear regression was conducted using the PANCE score only as the pass/fail rates were secondarily dependent on the raw PANCE scores with the passing score being 350 or above. The variables with statistical significance were the subject's age and GRE (verbal + quantitative) score. The independent variable consistently used was the associate degree in the health sciences or no associate degree in the health sciences. The confidence limits were maintained at 95% throughout the entire study. The linear regression showed the beta for the group that did not have an associate of science in the health sciences was 0.079 with a 0.101 p-value. First, the age of the subject showed a beta of -0.091

and a 0.058 p-value. Second, the GRE scores showed a beta of +0.274 with a 0.000 p-value.

Table 4.7 – Linear regression data.

Constant	Beta	t-value	p-value
AS – 1 not -2	0.079	1.642	0.101
Age	-0.091	-1.899	0.058
GRE score (V+Q)	0.274	5.749	0.000

Having an associate degree in the health sciences did not significantly affect the PANCE scores. In fact, the group with no associate degree in the health sciences had an expected increase of 0.079 points in each point of PANCE score. The first variable with statistically different means, age of the subject, demonstrated an expected effect of -0.091 for each point of PANCE score with each year of age. The linear regression analysis for this variable had a p-value of 0.058 (95% CL). This approached statistical significance, but was not significant within the confidence limit for this study. As the subject's age increased by one year, the expected change in PANCE score would have been 0.091 points lower. The other statistically significant variable, the GRE score, showed for each point increase in GRE score, there was an expected increase in PANCE score of 0.274 points. The p-values demonstrated that there was not a statistically significant effect on the PANCE scores due to group difference. There was a minimally negative effect with subject's age, and a definite positive

relationship with the GRE scores. The intermediate measures of success, graduation rates and PACKRAT scores were not added to the linear regression because there were no statistically significant differences in these measures based on the membership in either of the two groups.

Conclusions for Chapter Four

Most of the dependent variables, when examined through the lens of the independent variable, did not contribute a statistically significant difference in the three major categories of physician assistant success, graduation rates, PACKRAT scores, and PANCE performance. The PANCE score was the only measure of success upon which two of the dependent variables could have had an effect. The two notable dependent variables that showed differences in the PANCE scores were the applicant's age and their GRE scores. Two separate analyses were done base on the PANCE scores. The numerical comparisons between the PANCE scores of the two groups were done on the actual numerical scores, a continuous variable. The PANCE pass rates are based on a numerical PANCE score, of 350 or above, a dichotomous variable, and whether a subject passed or not. The differences in PANCE scores and pass rates between the groups were significant (t-value -2.541, p-value 0.011, mean difference -44.299). This finding and reasoning was the prompt to continue the analysis beyond the comparison of means and use a linear regression to ascertain the effect that the age and GRE scores could have on the PANCE scores and secondarily the pass rate.

Next, chapter five will discuss the findings from the data and possible ramifications of the findings as they apply to the proposed rationale and significance of the study. These data and findings could add to the ability of programs to accept students who have the best chance of success and give each physician assistant program an advantage in keeping graduation rates, PANCE scores, and pass rates high, avoiding a loss of tuition revenue.

Chapter 5

Conclusions

The basic premise of this dissertation was that for students entering the masters degree program who had a prior associate of science degree in the health care field would, as a group, perform better on the three measures of success in the program than would the group who had not had a prior associate degree in the health sciences. The three measures of success were (a) graduation from the program, (b) performance on the standardized test given to most physician assistant students nationwide, the PACKRAT, and (c) performance on the national certification exam, the PANCE. This study asked three research questions concerning these measures of success.

Restated Research Questions

Question 1 – Will physician assistant students who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science, A.A.S.) in the health sciences have statistically similar program completion rates as students who did not have such a degree?

Question 2 - Will physician assistant students who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science, A.A.S.) in health sciences have statistically similar scores on a standardized test, the Physician Assistant Clinical Knowledge Rating and Assessment Tool (PACKRAT) than those who have no associate degree in health science?

Question 3 - Will physician assistant program graduates who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science, A.A.S.) in health sciences have statistically similar scores on a standardized test, the Physician Assistant National Certifying Examination (PANCE), given to physician assistant students before they are eligible to apply for licensure?

The study was completed at a not-for-profit university in the southeastern United States. Students were those accepted to the physician assistant program (a master's degree program) in the cohorts graduating in 2007 to 2009. Data were first person data from scanned documents of the applicant's admission packet and outcomes were gathered from source documents from the various sources that publish the graduation rates and test results.

Summary of Findings

Analysis of the data showed that success rates on the three measures of success correlated with none of the independent variables or most of the demographic data. Graduation rates were not statistically different for the group with an associate degree in the health sciences and the group without an associate degree in the health sciences. Likewise, there was a small difference in PANCE scores between those two groups that was again not statistically significant. PANCE scores were the only measure of success where a difference existed between the group with an associate degree in the health sciences and those without an associate degree in the health sciences. Here, increased age and higher GRE scores each had an effect on PANCE scores. As each subject's

age increased, PANCE scores decreased, and as each subject's GRE score increased, the PANCE scores increased. The negative effect of age was not as marked as the positive effect of the GRE scores and the age effect was not statistically significant. The basic premise of this study based on the research hypotheses was not supported by the data analysis.

The three research questions were designed to use milestones in physician assistant education and certification as metrics for physician assistant student success. The three milestones were based on national standards and have the least dependence on the idiosyncrasies of the individual programs, local curriculum, and faculty. Collection of the data, therefore, was not dependent on collated or previously processed documentation from each program, local exams, or faculty evaluations, which would have been more subjective. The application data were retrieved from scanned documents in the CASPA and supplemental applications archived in the university's enrollment processing system database as first person data. The PACKRAT data are kept on an electronic datasheet sent directly to the individual program directors and the associate dean of physician assistant programs directly from the testing service then released by the program directors and the associate dean. Graduation rates and PANCE scores with pass/fail rates came from data sent by the associate dean who has access to the NCCPA data for the programs overseen by him. It was important that all data used were from original source documentation. First person data sources and direct data releases add to the validity of the study compared to using previously tabulated or collated data taken from secondary sources

(Hagedorn & Kress, 2008; Pfeiffer & Windham, 2008; Shoenecker & Reeves, 2008). The drawback of this method, was that data had to be gathered from various sources and matched to each individual subject. Data items from separate data sources were matched to each individual student in a spreadsheet format and collated. The subjects were those 435 physician assistant students who matriculated in graduation years 2007 to 2009 from the physician assistant programs.

Discussion

Research question 1. Will physician assistant students who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science, A.A.S.) in the health sciences have statistically similar program completion rates as students who did not have such a degree?

Hypothesis 1 – Physician assistant students who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science, A.A.S.) in the health sciences will have statistically better program completion rates than students who did not have such a degree.

In answering the first research question, the data involved comparing the graduation rates of the two study groups. The graduation rates from the program were compared as a categorical value. The group with an associate degree in the health sciences had a of 94.2% completion rate while the group without the associates degree in the health sciences had a 96.9% completion rate. Comparison with a Peterson chi-square showed a value of 0.956 with one degree of freedom. Using a 95% confidence limit, the two-sided test p - value of

0.328 failed to demonstrate statistical significance. The hypothesis of the first question was that the group who had an associate degree in the health sciences would have a higher graduation rate than the group who did not have an associate degree in the health sciences. This comparison of percentages by the Peterson chi-square did not demonstrate statistical significance; therefore, the first hypothesis was not supported.

Research question 2. Will physician assistant students who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science, A.A.S.) in health sciences have statistically similar scores on a standardized test, the Physician Assistant Clinical Knowledge Rating and Assessment Tool (PACKRAT), than those who have no associate degree in health science?

Hypothesis 2 - Physician assistant students who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science, A.A.S.) in health sciences will have statistically better scores on the standardized test, the Physician Assistant Clinical Knowledge Rating and Assessment Tool (PACKRAT).

Two of the programs give the PACKRAT twice, but the score that each subject earned during the clinical rotation portion of the program was the only score used for this study. The groups were separated into those who had an associate degree in the health sciences and those who did not have an associate degree in the health sciences. The PACKRAT scores are a continuous variable only. There is no passing score, but the scores are tabulated as a percentile of

how each student did compared to a national norm consisting of the scores earned by everyone who took the test nationally during the testing cycle as the study subjects. The average score of the group with associate degrees in the health sciences was 136.4 points, while the average score of the group without that associate degree was 141.2 points. A t-test was used to compare the mean scores of both groups. This determination considered each group as an independent sample based on the fact that the groups were not tied to each other by time or events. The variance of the group with an associate degree in the health sciences and those without were 368.21 and 342.91 respectively. With equal variances not assumed, the standard error of difference was 2.961 and using a 95% confidence limit, the p-value was 0.123, demonstrating the difference was not statistically significant. These findings did not support the hypothesis for question two that the group with an associate degree in the health sciences would have a higher average score on the PACKRAT than would the group without an associate degree in the health sciences.

Research question 3. Question 3 - Will physician assistant program graduates who have attained an associate degree (i.e., associate of science, A.S.; associate of applied science, A.A.S.) in health sciences have statistically similar scores on a standardized test, the Physician Assistant National Certifying Examination (PANCE), given to physician assistant students before they are eligible to apply for licensure?

Hypothesis 3 - Physician assistant program graduates who have attained an associate degree (i.e., associate of science, A.S.; associate of applied

science, A.A.S.) in health science will have a statistically better score on the standardized test, the Physician Assistant National Certifying Examination (PANCE), given to physician assistant program graduates before they are eligible to apply for licensure.

Results on the PANCE were the third measure of success for the physician assistant students used in this study. PANCE scores are a continuous variable while pass rates are a categorical variable. The continuous variable counts the number of questions the examinee answers correct for a numerical score, while the categorical variable takes into account whether or not the candidate passed the exam. The passing score for the PANCE was 350 points and is needed for national certification and initial licensure. Those scoring 350 points or above passed the exam and were certified, while those who scored below that threshold had to retake the exam after the specified waiting period of ninety days.

Initially, the continuous variable of the numerical score was examined. Using a t-test to compare the means, the p-value was 0.020, not assuming equal variances. This finding demonstrated a statistically significant difference in the two outcomes. The results on the PANCE exam of the group without an associate degree in the health sciences were significantly higher than the group who did have an associate degree in the health sciences.

The second part of the measurement was the pass rate for the PANCE, a categorical variable. This variable was compared using a Peterson chi-square test. Of the subjects who did have an associate degree in the health sciences,

71.2% passed the exam. Of the subjects who did not have an associate degree in the health sciences, 85.1% passed the PANCE on the first time taking the exam. The Peterson chi-square determination showed a value of 7.313 with a significance value of 0.026 using a two-sided 95% confidence limit.

Comparisons of the results of the PANCE scores and the PANCE pass rates both demonstrated a significantly higher pass rate for the group without an associate degree in the health sciences.

This difference between the groups did not support the hypothesis for the third research question. In this case, as compared to the results for the first two research questions, this difference did not support the hypothesis and showed a statistically significant difference between the two subject groups. Passing the PANCE is perhaps the most significant measure of success as it leads to entry level in the physician assistant profession.

These findings support the study done by Cody et al. (2004) that showed physician assistant students who had jobs/careers in the medical field prior to entry to physician assistant school did not do as well as students who worked in nonmedical jobs prior to entry to the physician assistant program. Other findings in the 2004 Cody study showed that older students also did not do as well as younger students. Differences in achievement correlated to prior work experience and age, prompted further investigation. Linear regression analysis was used to examine any effect that the only two variables with statistical significance, the subject's age and GRE scores, may have on the PANCE score.

This analysis will be presented after the following discussion of the descriptive data.

Discussion and defense of the descriptive data. The descriptive data items gathered in this study were age, gender, ethnicity, science and overall GPA, and GRE scores. Frequencies and descriptive data analyses were performed on each of these items in the subject population and the two study subgroups. Age was the first to be examined as a separate descriptor. The average age of the total subject population (25.70 years) fell between the ages of the two subgroups. The average age of the group with an associate degree in the health sciences (27.67 years) was older than the age of the group without a degree in the health sciences (25.44 years). Prior research showed that younger students did better on the PANCE as well as in test scores during the first year of physician assistant school. A possible explanation for the age difference may be that the students who did earn a professional degree in the health sciences worked in their chosen field until making the decision to return to college to get their baccalaureate degree or complete the prerequisites for physician assistant school. The students without the associate of science in health sciences could have been early decision makers in choosing the physician assistant profession as their vocation (Cawley, 2004; Cody et al., 2004). This difference in age between the two groups existed with a statistically significant difference in each of the group's PANCE scores. For this analysis, the p-value was 0.006 indicating a statistically significant difference between the groups' PANCE scores. It was not possible to determine in this study, if the difference in PANCE scores

between the two groups was due to the earned associate of science degree in the health sciences or not, or the difference in the average age of the two groups.

Table 5.1 – Independent values t-test data (for equality of means)

	t	df	Sig. (2 tailed)	Mean Difference
PACKRAT	-1.565	57.491	0.123	-4.633
PANCE	-2.386	56.587	0.020	-44.299
Age	2.761	433	0.006	2.227
Sci. GPA	-0.188	61.283	0.852	-0.01032
Overall GPA	-1.472	60.296	0.146	-0.07140
GRE score V+Q	-2.578	64.154	0.012	-56.625

The only other statistically significant variable, their GRE scores, gathered from the application data provided by each student before they started matriculation, had no required minimum score needed to meet entrance requirements. The study population's mean GRE score was 999.35 points, the group with an associate degree in the health sciences mean GRE score was 949.41 points, and the group without an associate degree in the health sciences GRE score was 1006.04 points. The group with the lowest average age had statistically higher GRE scores on admission shown by the p-value for equal variances of 0.012. Younger students could have been more comfortable with test taking, especially if they had recently been in college and had taken

comprehensive tests more recently than the older students, or may have just been more comfortable with a testing environment that is more automated than the other, older group might have been.

Gender was another characteristic that was considered as a single variant. There are more women than men entering physician assistant programs nationwide, and the study university was no different. The study population included 331 women and 104 men, a 3.18 ratio. The group with an associate degree in the health sciences was comprised of 34 women and 17 men for a 2.00 ratio, while the final study group had 297 women and 87 men for a 3.41 ratio. The group with the oldest average age had a higher male percentage than the other two groups. Data analysis gave no clue to the reason why the group that was older with associate degrees in the health sciences would be more skewed toward men in the comparison group. One possible reason could be that men wanting to launch a career, began postsecondary education in a community college, and attained their associate degrees for the quickest possible entry into the labor force. For the younger population, those without an associate degree in the health sciences, it would appear these applicants were focused on the physician assistant career from their undergraduate studies and opted for entry into this graduate program instead of an early entry into the job market. This group, which had a higher ratio of women to men, entered physician assistant education earlier with less of a break from their undergraduate education.

Ethnicity was a category that needed modification prior to analysis to be more meaningful. There were seven categories gathered originally. In the

smaller study group, several categories were not large enough for meaningful analysis. The three largest categories were maintained as, White, Black, and Hispanic/Latino. The category titled Other was comprised of the subjects who described themselves as Other, including Native Americans, Asian/Pacific Islander and those describing themselves as “Undeclared”. The three largest categories remained intact and a fourth, with enough subjects for analytic purposes, added. The need to combine ethnic categories, would indicate there are not sufficient numbers of the smaller ethnic groups to represent the regional ethnic distribution. Low numbers of diverse ethnic groups may indicate the ethnic diversity in physician assistant student populations does not approach the diversity of the community or region. Searching out ways for physician assistant schools to increase access to ethnically diverse students should be ongoing throughout the admissions process.

Ethnic groups were compared using a Peterson chi-square test for analysis showing a p-value of 0.377 for the comparison, indicating no statistically significant differences in the ethnicity between the study groups. The group with the associate of science in the health sciences, interestingly, had the lowest percentage of Whites and higher percentages of the three other ethnic breakdowns than either the study population as a whole or the group without an associate degree in the health sciences raising what could be an important issue for further study.

Table 5.2 - Ethnic group distribution.

Ethnicity	Study Pop.	With A.S. in H.S.	No A.S. in H.S.
White	300 (69.0%)	30 (58.8%)	270 (70.3%)
Black	27 (6.2%)	5 (9.8%)	22 (5.7%)
Hispanic/Latino	56 (12.8%)	8 (15.7%)	48 (12.5%)
Other	52 (12.0%)	8 (15.7%)	44 (11.5%)
Total	435 (100.0%)	51 (11.7%)	384 (88.3%)

Reports on the state of the community college nationally bear out some possibilities on the topic of ethnicity in post-secondary education. Considering that students of diverse ethnicities often see the community college as their pathway to the higher education system, many of the subjects in this study may have gotten an associate degree in the health sciences as their first degree. In 2005, one in every five community colleges had minority students as over half of their student enrollment and conferred over 70% of all associate degrees, with health science degrees being the second most commonly earned degree (Provasnik & Planty, 2008). Taking these data into account, it would stand to reason that more of the students coming from the associate degree in the health sciences at a community college environment would be more ethnically diverse than students coming from a four-year institution. This is a possible explanation

of a higher ethnically diverse population in the group with an associate degree in the health sciences, even though the statistical significance was not shown.

Two other variables not demonstrating statistical significance were the undergraduate sciences and overall GPA. The group with an associate degree in the health sciences mean science GPA was 3.20 points, and the group without an associate degree in the health sciences' mean science GPA was 3.21 points. These data were clustered around the midpoint of the curve in the largest possible scale used. The program admission standards called for a minimum GPA of 2.8 to be considered at the time the subjects were accepted, with 4.0 (based on a 0.0 – 4.0 scale) used as the highest GPA possible. The range of GPA values revealed some of the subjects had science GPAs of 2.5, below the published minimum requirements, and were probably taken as exceptions by the programs, using other criteria for acceptance. The possible acceptance considerations for applicants falling below the grade point average threshold (2.8 points) were not available in the first person data used in this study. Comparing the two groups with a t-test for independent samples having unequal variances, the p-value was 0.852 using a 95% confidence limit, demonstrating no statistical significance.

The overall GPAs for the two study groups, upon analysis, demonstrated no statistically significant difference. The distribution curve had a range of 2.50 to 4.50, was bell shaped and not skewed. Again, there was one value below 2.5 points, showing that a student was accepted into a program with a GPA below

the minimum requirement. The program accepting this student possibly used other qualifications for acceptance that were not available for this study. In

Table 5.3 – Demographic data items.

Data item	Subgroup	With A.S. in H.S.	No A.S. in H.S.
Age (sig)		27.67 years	25.44 years
GRE score (sig)		949.41 points	1006.04 points
PACKRAT score		136.51 points	141.41 points
PANCE score		454.89 points	499.19 points
PANCE pass/fail		36/47 (76.6%)	328/364 (90.1%)
Gender	Female/Male	34/17 (2.00)	297/87 (3.43)
Ethnicity	White	30/51 (58.8%)	270/384 (70.3%)
	Black	5/51 (9.8%)	22/384 (5.7%)
	Hispanic/Latino	8/51 (15.7%)	48/384 (12.5%)
	Other	8/51 (15.7%)	44/384 (11.5%)
GPA	Science	3.20 points	3.21 points
	Overall	3.26 points	3.33 points
Grad rate		48/51 (94.1%)	372/384 (96.8%)

comparing the study groups, the group with an associate degree in the health sciences had an overall GPA of 3.26 points, while the group without an associate degree in the health sciences had an overall GPA of 3.33 points. Comparing the means using a t-test for independent samples, the p-value with inequality of

variances was 0.146 showing the difference in the values of the overall GPAs was not statistically significant.

Discussion of the findings. The only measure of success statistically different on group comparison, were the PANCE scores, and secondarily the PANCE pass rate. A linear regression was done keeping the independent variable the same as throughout the study. The only demographic variables with a difference between the two groups were age and GRE scores. The linear regression showed that there was a minimal positive effect for students who did not have an associate of science in the health sciences, a more pronounced negative effect for increasing age, and a statistically positive correlative effect with increased GRE scores.

Table 5.4 – Linear Regression Findings.

Model	Beta	t-value	p-value
1 (constant)		4.971	0.000
AS-1/Not-2	0.079	1.642	0.101
Age	-0.091	-1.899	0.058
GRE (V+Q)	0.274	5.749	0.000

These findings correlate with the study done by Cody et al. (2004) showing that older students, those with prior medical experience, or who did poorly on the PACKRAT, earned lower scores on the PANCE. In the present study, gender was not a significant factor, supporting a published study by

Hooker et al. (2004). The Hooker study showed that age was also not a significant factor, not supported by the present study. Age and gender were specifically addressed in a study by Aspry et al. (2004) correlating with the beta of -0.091 ($p = 0.058$) as found in this study although the beta was not statistically significant. Gender differences showed that as females aged, their decrease in PANCE scores was not as marked as the males, but both followed the same downward trend as age increased.

Two considerations emerged while examining the data. The finding that the group with an associate of science degree in the health sciences was older than the group without an associate degree in the health sciences, made it difficult to suggest which might be the cause of lower PANCE scores, age or an associate of science degree in the health sciences. The lower scores in this group may or may not be attributable to the age of the group rather than the attainment of an associate degree in the health sciences. The GRE scores were lower in the group with an associate degree in the health sciences than in the group without an associate degree in the health sciences. Comparing the means (with A.S. = 949.41 points vs. without A.S. = 1006.04 points) showed a statistically significant difference (p -value = 0.012). Whether the subject's age or the attainment of an associate degree in the health sciences was the primary contributor to these findings is not certain from the analysis performed in this study. A possible explanation of this phenomenon could be that the group with an associate of science in the health sciences had a prior career with more time elapsed since being immersed in an academic environment and further removed

from any testing environment, especially the structure of standardized or automated testing such as the GRE. The subjects in this group, being older, may have more necessary outside responsibilities or distractions than the students who entered directly from undergraduate education. Subjects with an associate of science degree in health science may have more chance to be involved in a home, family, and community. These factors could detract from pure study time and force this group to deal more with problems of daily living than the group without an associate degree in the health sciences.

The subjects with an associate degree in the health sciences may have begun a career in the health sciences, subsequently deciding to move to a different health care field or advance in their current field. Such movement may create problems on several levels for the potential applicant. They could be forced to return to school and earn their baccalaureate degree or take the necessary prerequisites for admission to a baccalaureate degree, forcing the potential applicant to interrupt their career or place in the workforce. If the applicant's prior career did not involve medical patient care, then again a paradigm shift could be necessary for the applicant. These situations could create enough difficulty or adjustment problems for the applicant in a career shift to experience limited success when they finally are accepted to a physician assistant program.

It would seem students who opted to either move to a different health care field or advance in their current employment would be older than those students to whom the physician assistant profession was the first choice. The population

of the two groups, both in gender and ethnic diversity were also different. With myriad data category differences between the two groups, examining these differences either singly or in combinations may yield more specific answers to the reasons for the differences. Sorting the study populations according to gender and ethnicity was not in the design of this study and was not undertaken at this time.

Conclusions

During the process of selecting physician assistant school applicants, the data items available to the selectors are those found in the CASPA application and in all likelihood, any subsequent supplemental application required by individual physician assistant programs. These data sets are the only information that the schools and the selection committees have at the time of student selection. The vast majority of studies on PANCE pass rates previously done used measures of student performance after acceptance to the program or a hybrid of pre-application factors coupled with program performance. It is too late for the selection process if the PANCE pass rate prediction is based on student performance after admission to the program. Variables showing significance in this study were gathered from the application as data existing prior to matriculation. Age was a negative predictor with an effect approaching significance ($\beta = -0.091$, $p = 0.058$) and GRE scores a positive predictor with a much more significant positive effect ($\beta = 0.274$; $p = 0.000$). GRE scores should probably make a difference in the acceptance process for physician assistant programs while the effect of age was not statistically significant. When examined

through the lens of this study, these findings should be tempered by the fact that many of the items gathered from the prospective student's application used as criteria for acceptance over other prospective students were not significant indicators of PANCE performance. The items showed not to be significant in this study could possibly have an effect when coupled with different independent variables or grouped in different combinations of dependent variables. These criteria, without statistically significant differences, as science and overall GPA, ethnicity, gender, or discontinuation rates, may be used with a different independent variable and grouped with different dependent variables for future projects.

Throughout the body of literature, for instance, age has been commonly studied, often paired with other variables both independent and dependent, usually PANCE performance, GPA, local test scores, or performance on standardized tests. When paring the GRE and age with the independent variable associate of science in health sciences or not, the results found in this study could possibly be reproduced. Selection of this particular item as the independent variable was done as a way to determine if prior experience with the health sciences or in the health care fields could make a difference in physician assistant school outcomes. Findings secondary to the selection of the independent variable show that the completion of an associate of science degree in the health sciences as opposed to not completing an associate of science degree in the health sciences did not affect the success rates of the subjects as measured in this study. There were demographic and prior performance factors,

namely age and GRE scores, which contributed more to the outcomes than did the attainment of an associate degree in the health sciences.

Implications

Impact on the application process, findings, and selection methods.

The results of this study should foster some changes in the way schools look at the prospective students. Originally, the implications were hypothesized to be positive but the original study hypotheses were not supported. Even so, these findings could lead to guideline refinements for student selection leading to several benefits for the institutions following them. More accurate selection criteria would include fewer students not completing the programs; therefore, less loss of tuition revenue, PACKRAT scores higher in comparison to the national average, more efficient use of the available seats in each program, and a better success rate for students taking the PANCE. The problem of students selected to physician assistant programs and not completing the program is a small one at present. The results of this study showed the students selected had over a ninety-five (95%) completion rate. The selection process now can be improved and changes made to use more accurate processes in the future, preparing for a time when the number of applicants per available seat decreases and the applicant consideration will need to be more accurate.

In this study, where the three hypotheses were not supported, negative implications could still benefit the selection process. Analysis of gender differences did not show a significant effect on physician assistant success rates. Women did experience less variability of the measures of success across the

age range of an effect than men (Aspry, 2004). Based on the results, higher than average GRE scores would be positive predictors of success. Since there was no determination of the correlation for a GRE absolute number, it may serve programs to add the GRE score to the ranking of the applicants during the admission process.

Age and GRE, therefore, should be considered as the primary variables in question for the findings of this study. The programs studied did not have a minimum GRE score for applicants, as well as there was no age range specified for the applicants. Anecdotally, many faculty members who sit on admissions committees wish to have a few students in each class with some life or work experience to temper the youth and inexperience of the majority of the younger students. If the results of this study are believed to have credence, then the older students taken should have relatively high GRE scores. Selecting by gender, ethnicity, and science or overall GPA should not make as much difference in the PANCE success rates for the individual programs as age and GRE scores. This would be the case for when federal equal opportunity and treatment guidelines should be followed and a consideration of a minimum science and overall GRE score, as requirements for acceptance, should be followed.

Recommendations for practice. Programs looking to accept the students with the best chance for success, both in program completion and PANCE pass rates, have a great deal of raw data to process. Focusing on certain high value data sets can streamline this process and decrease the

chance of inefficiency in the selection process and, secondarily, increase the retention of students and program completion rates, while decreasing the effect of non-completion on the financial bottom line for the institution.

Increasing the efficiency of the selection process would not necessarily change the minimum requirements for acceptance. Streamlining the choice of applicants would occur during the process where the applicants are ranked and selected. All the applicants not meeting the requirements should be culled out while the ones meeting the standards selected for further review. From this stack of candidates, the positive effect of the GRE score was more significant than any of the negative effects of any other factor. In an equal opportunity and treatment institution, the positive effect of the GRE score should stand alone. Programs, especially those who have no minimum GRE score as a cutoff, would be well served to rank their applicants by giving more weight to the GRE score. Favorable outcomes, as stated earlier, would be increased graduation rate, higher PACKRAT scores, and higher PANCE scores.

Using the findings of this study as one of the criteria for selecting students could have a positive impact on student success. Many other predictors of student success used mixed criteria, of which, only part of the data were available prior to admission. This meant that performance after entry into the physician assistant program was one of the other predictors (Asprey et al., 2004; Cawley, 2004; Cody et al., 2004; Hess, 2004; and Oaks et al., 1999). Using a student's performance in the program as a predictor is critical for early intervention in a student's career to identify who might not have been successful

without it. This, however, will not enable more efficient and accurate selection of students for programs using data that are available pre-admission that can help select students with the greatest chance of success without relying as much on performance after the program starts. An increase in success rates, especially graduation rates and PANCE pass rates, secondary to higher scores, can make a big difference to the institution, the students and after graduation, the patient population, and the medical community.

Recommendations for future research. The outcomes as discussed above could be further coupled to first person admission data by further separating the categories. A comparison of the age effect on PANCE scores after separating the subjects by gender would lend itself to supporting the study by Hooker (2004). Ethnicity would be an important study topic and should be handled the same way as age and GRE scores to provide the basis for more ethnic diversity in physician assistant programs. If there is an age, gender, or ethnic bias demonstrated in physician assistant programs today, data sets like this could help to break through those stereotypes. Seating classes with a diverse base of ethnicity could potentially help develop a population of health care providers who will work in the areas of our country that suffer a dearth of health care providers. Many areas do not have adequate numbers of health care providers possibly due to the reluctance of many graduates to move to that area or involve themselves in a culture that is unfamiliar to them. Studies using other types of first person data from the students are also a potential for further study, possibly essays, personal statements, undergraduate majors, or current

environment. Selecting students who were not successful in the physician assistant program and using their preadmission data could give insight into the reasons students may fail. Many items in the CASPA and supplemental applications were not used in this study but are available to future researchers and may lead to potential topics for further study. Academic rigor of the applicant's major field of study may give more clues to the potential success of the candidate, especially if coupled with the GPA for each student. For instance, a lower GPA in a field with more scientific rigor could make a candidate more suitable than a higher GPA in a non-scientific field. Grades in coursework done prior to post-secondary education for each applicant were not available. Examining test scores, course grades, and GPAs in high school could show why some students chose vocational education as their entry degree into post-secondary education rather than enrolling into a four-year degree directly after high school.

Further study should also be performed on programs in different settings. Category of institution may prove to be significant, as in state funded, not-for-profit, for-profit, or on-line/distance learning. The setting of the institution may also make a difference, urban, suburban, or rural institutions may attract different student demographics. Graduation rates and PANCE scores and pass rates were high in the study institution. Replicating this study in an institution with lower graduation rates and PANCE scores, could be valuable. There was at least one applicant selected whose admission data fell below the posted minimum standards for acceptance. An investigation of programs that accepted students

who did not meet their minimum requirements coupled with study of the students themselves for post-graduation outcome measures would lend insight to the qualities that the applicants demonstrated in order to be selected over someone who met all the requirements. With over two applicants per seat nationwide (Ruback et al., 2007), this would indicate that students who did not meet the minimum requirements were selected over those who did. The admission committee's notes and members' statements could make a valuable contribution to investigating the qualities that the program representatives perceived in order to accept the applicants who did not meet the minimum published standards.

Along with expanding the scope of the study, an adjustment in the hypotheses should be considered because none of the three study hypotheses were supported by the data. In newer attempts at examining first person admission data, hypotheses that suggest the outcomes of this and other studies (Cody et al., 2004) could be used as guidelines for creating hypotheses that more closely relate to the findings noted in this study.

Testing physician assistant students using the PACKRAT exam should be studied more closely. A difference in graduation rates and PANCE success rates among students who took the PACKRAT exam only once, near graduation, with those who took the PANCE twice could benefit physician assistant programs. Benefits would include cost savings for the programs that give the PACKRAT exam twice, eliminating one of the payments for the PACKRAT exam. The PACKRAT exam is a high stress environment for the students during a time when they have a full academic load, and this stress could be decreased for the

students who take it in their didactic year by eliminating one testing situation. The real benefits, if any, of taking the PACKRAT exam twice should be determined.

Another item that the data uncovered was that the ethnic and gender diversities were greatest in the group with the associate of science in the health sciences. According to Provasnik and Planty (2008), many community colleges have a high percentage of minority students and this may help to explain the increased ethnic diversity found in the group with an associate of science degree in the health sciences. Culturally and ethnically diverse health care practitioners can identify and communicate with the portions of our population that are most in need of health care. Study to discover how to select these practitioners from the community college educated applicants can produce greater numbers of health care providers with the best chance to assimilate into the cultural subgroups throughout the country. The practitioners themselves could benefit through the experience of practicing in non-traditional health care facilities while they have the possibility of having student loans repaid for working in underserved areas.

Gender makeup of the physician assistant profession has changed from the early days of the physician assistant profession where the first physician assistant class had all males (AAPA, 2009) to the present, where the majority of physician assistants in our country are female (Larson & Hart, 2007). The predominance of female practitioners creates a minority effect for the males in physician assistant school. No studies known to this researcher have been done to determine if this is a stress producing situation in physician assistant programs or not. It stands to reason that since more physician assistants are female, more

females will be found in physician assistant program faculty positions. It is not known if gender itself is a factor in physician assistant success and if a particular gender is favored either situationally or emotionally. Using gender as an independent variable in future studies could be valuable in analyzing potential effects of gender makeup on physician assistant student populations. After graduation, the effect of gender in hiring, job performance, and workplace satisfaction could be analyzed to determine the effects of gender distribution of physician assistant students. The issue of gender lends itself to further study, not only in the classroom, but in the workplace.

This study showed that a prior associate degree in the health sciences was not a predictor in success in physician assistant education. Many of the variables gathered from the admission data did not contribute significantly to success in the programs. A variable that did contribute significantly to a difference in outcomes between the two study groups were the student's GRE scores. Age could have also contributed to outcome differences, but statistical significance was not upheld. The study did show that older students as first time PANCE takers did not score lower than younger students, but not significantly lower. The GRE scores were a positive predictor in PANCE scores, as the higher the GRE, the higher the predicted PANCE score. Based on the data presented, with the three study hypotheses not supported, information gathered and conclusions reached are valuable. Especially so, for any physician assistant program seeking to refine the applicant acceptance process and increase the success rates in their programs. Finding that the independent variable and most

of the dependent variables did not contribute significantly to the measures of success of the subjects, using the subject's age or GRE scores, or both, could perhaps give more insight into criteria selection that will aid in physician assistant program's ability to choose applicants with the best chance of success.

Further examination of the data items, while grouping the variables differently, could provide data outcomes that may be more specific for the PANCE score outcomes as well as providing more evidence that could be used for applicant selection. Since all these data items are found on the applicants CASPA or supplemental application, they can be gathered by any of the physician assistant programs using the CASPA system. If data is grouped and analyzed differently, the base of studies using application data would be broadened.

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Appendices

Appendix A: University of South Florida IRB Approval Letter



DIVISION OF RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX (813) 974-5618

December 17, 2010

David Kotun
Adult, Career and Higher Education

RE: **Expedited Approval** for Initial Review
IRB#: Pro00002834

Title: Dissertation investigating “Success Rates of Physician Assistant Students Holding Associate Degrees Compared to Students with a Baccalaureate Degree as Their First Degree”

Dear David Kotun:

On 12/17/2010 the Institutional Review Board (IRB) reviewed and **APPROVED** the above referenced protocol. Please note that your approval for this study will expire on 12-17-10.

Approved Items:
Protocol Document(s):

[Success Rates of Physician Assistant Students with Associate Degrees](#)

11/16/2010 6:32 PM 0.01

Consent/Assent Documents:

Name	Modified	Version
Waiver of informed consent process.		

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The

IRB may review research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review category:

(5) Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis).

Your study qualifies for a waiver of the requirements of informed consent process as outlined in the federal regulations at 45CFR46.116 (d) which states that an IRB may approve a consent procedure which does not include, or which alters, some or all of the elements of informed consent, or waive the requirements to obtain informed consent provided the IRB finds and documents that (1) the research involves no more than minimal risk to the subjects; (2) the waiver or alteration will not adversely affect the rights and welfare of the subjects; (3) the research could not practicably be carried out without the waiver or alteration; and (4) whenever appropriate, the subjects will be provided with additional pertinent information after participation.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval by an amendment.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-9343.

Sincerely,



John Schinka, PhD, Chairperson
USF Institutional Review Board

Cc: Various Menzel, CCRP
USF IRB Professional Staff

Appendix B: Nova Southeastern University IRB Approval Letter



MEMORANDUM

To: David E. Kotun, PA-C
Health Professions Division – College of Allied Health and Nursing

From: Ana I. Fins, Ph.D. *AK*
Chair, Institutional Review Board

Date: January 20, 2011

Re: *Dissertation Investigating "Success Rates of Physician Assistant Students Holding Associate Degrees Compared to Students with a Baccalaureate Degree as their First Degree"*
Research Protocol No. 12161005Exp.

I have reviewed the revisions to the above-referenced research protocol by an expedited procedure as well as additional revisions requested. On behalf of the Institutional Review Board of Nova Southeastern University, *Dissertation Investigating "Success Rates of Physician Assistant Students Holding Associate Degrees Compared to Students with a Baccalaureate Degree as their First Degree"* is approved in keeping with expedited review category #5. Your study is approved on **January 20, 2011** and is approved until **January 19, 2012**. Your waiver of the Informed Consent process and documentation of Informed Consent are granted in keeping with 45CFR46, 46.116(d) and 46.117(c). **However, you may not begin the study until we have a letter of approval from the University of South Florida IRB.** You are required to submit for continuing review by **December 19, 2011**. As principal investigator, you must adhere to the following requirements:

- 1) Waiver of the process of consent and signed documentation consent is granted in keeping with 45CFR46, 46.116(d) and 46.117(c).
- 2) **ADVERSE EVENTS/UNANTICIPATED PROBLEMS:** The principal investigator is required to notify the IRB chair of any adverse reactions that may develop as a result of this study. Approval may be withdrawn if the problem is serious.
- 3) **AMENDMENTS:** Any changes in the study (e.g., procedures, consent forms, investigators, etc.) must be approved by the IRB prior to implementation.
- 4) **CONTINUING REVIEWS:** A continuing review (progress report) must be submitted by the continuing review date noted above. Please see the IRB web site for continuing review information.
- 5) **FINAL REPORT:** You are required to notify the IRB Office within 30 days of the conclusion of the research that the study has ended via the IRB Closing Report form.

The NSU IRB is in compliance with the requirements for the protection of human subjects prescribed in Part 46 of Title 45 of the Code of Federal Regulations (45 CFR 46) revised June 18, 1991.

Cc: Dr. M. Samuel Cheng
Dr. Jaime Arango

Office of Grants and Contracts
Institutional Review Board
3301 College Avenue • Fort Lauderdale, Florida 33314-7796
(954) 262-5369 • Fax: (954) 262-3977 • Email: irb@nsu.nova.edu • Web site: www.nova.edu/irb

Appendix C: Sample CASPA Application

Instructions & FAQs > About CASPA/Overview

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INTRODUCTION TO CASPA

The Central Application Service for Physician Assistants (CASPA) simplifies the process of applying to physician assistant programs. By using CASPA, you are able to complete one application via our online website and send one set of documents to our centralized service. CASPA will verify your application for accuracy, calculate your G.P.A., and send your application to as many physician assistant programs you wish to designate who utilize our service. For a list of participating programs, look at the [Participating Programs](#) section.

BEFORE APPLYING TO CASPA:

Before creating an account, determine if you are eligible to apply, and ensure you are applying for the correct application cycle. Each PA program has different requirements and prerequisites for entry. Please contact the schools to which you are applying directly concerning their entry requirements. In addition, the application cycle refers to the time span in which your CASPA application is valid, not the academic year in which applicants will be admitted. Each PA program has its own start date; to determine exactly when a school's program will begin and to ensure you are filling out the correct application, we advise contacting the school directly.

The following steps are highly recommended BEFORE applying:

1. **Read through all of CASPA's policies, instructions, and Frequently Asked Questions at our site, <https://portal.caspaonline.org/>.**
2. Contact your schools to determine what types of references they require and line up references and their contact information
3. Request official copies of transcripts to be sent to you to aid you in filling out the coursework portion of the CASPA application (these can NOT be the same ones later sent to CASPA)
4. Compose your narrative in a word processor. Please note CASPA has a character limit of 5000 characters, including spaces, line breaks, etc. Please note that we have found that Notepad's character count to be more reflective of CASPA's than the system employed by Microsoft Word.
5. Research your school's deadlines. **Note that these may be different than the deadline to submit to CASPA.** Submission deadlines are posted under "Participating Programs."

CREATING AN ACCOUNT:

To create an account, click "Create New Account" beneath the login information on the CASPA homepage. Please be sure you are eligible to apply and are creating an account for the correct cycle before creating a new account. Please see the "Before Applying to CASPA" section of our instructions for detailed information. **YOU MAY ONLY CREATE ONE ACCOUNT PER APPLICATION CYCLE.** Creating more than one account will lead to delays and difficulty in

handling the receipt of your transcripts and letters of reference. **Any applicant who creates multiple accounts will have their duplicate accounts terminated, including any documents associated with those accounts.**

You will be asked to create a username, password and supply a valid e-mail address. You will also be asked to create a security question to help you retrieve your login information should you forget it. You will then be assigned a CASPA ID#. Be sure to retain all of this information. For your own security, do not share your password or account information with anyone.

COMPLETING THE APPLICATION:

Once you create an account with CASPA, you can access your application frequently in order to complete the required portion of the application. To ensure you complete the application correctly, please read through ALL Instructions and Frequently Asked Questions, as they will help guide you through each section of the application. After you have created and completed your application, you can e-submit it to CASPA for processing. Processing times vary, but can take up to FOUR WEEKS from the date your application becomes COMPLETE.

In order for CASPA to consider your application COMPLETE and process and mail your application to your schools, the following steps must all be completed.

1. All U.S. and English speaking Canadian official transcripts must arrive at CASPA
2. Two out of your three letters of reference must be received by CASPA
3. You must e-submit your online CASPA application
4. All application fees must be paid to CASPA

BEFORE YOU E-SUBMIT YOUR APPLICATION

- Use the Transcript Request Form to have all official transcripts sent to CASPA.
- Print your application for your records.
- Make sure all information is accurate. **Refunds cannot be made once your application has been submitted.**

We advise all applicants to **APPLY EARLY!** Submitting your materials early helps ensure timely processing and avoids costly delays. Generally, it takes **7–10 business days** for items such as transcripts, paper references, or mailed payments to be received by CASPA from the date they are mailed. Remember, **once your application is considered COMPLETE, it can take up to FOUR WEEKS for it to be processed and mailed to your programs**. Therefore, to ensure your application is mailed on time, ALL MATERIALS should arrive at CASPA four weeks prior to your earliest deadline.

Once the application is processed, it will be sent to your designated programs. The CASPA application will provide your designated programs with your complete biographical information and a detailed description of your academic history.

YOUR ACCOUNT HOMEPAGE

Once you create an application, you will come to the main page. You can now navigate through the application either by the top menu items or the Checklist. This page will also display the FAQs, Status of your application and Messages from CASPA. The Checklist allows you to navigate to each section and will have a green check once the section is complete. Once all items are

checked and completed, this is the page to e-submit your application.

My Profile

Use this section to change Account information (name change, email address, etc.) and change your password.

My Application

Use this section to access each section of your application. This is also available through the Checklist.

Reference Forms:

Reference forms are available either electronically or on paper form. Electronic references will be easier to track. If you use a paper form, make sure you use the form provided in this section. Please be aware that your G.P.A. will be calculated, but your application will not be considered complete and will not be sent to your designated programs until at least 2 of your 3 required references have been received in the CASPA office.

Applicant Information:

Use this section to input your Contact Information and Personal Data.

Additional:

This includes the following sections: Additional information, Health Related Experience, Patient Contact Experience, Other Employment and Community Service

Academic History:

You must complete the Institutions Attended section before you can enter your coursework. The coursework will be entered by the semester, quarter or term that you attended by creating a Session/Term. Under the Session/Term, you will enter each course taken or that you are planning to take. Enter any Health Related Training, such as CNA or CMA in this section.

Narrative:

Provide a narrative explaining why you are interested in becoming a PA. This is your opportunity to let the program or programs that you are applying to know a little more about you.

My Programs:

This is where you can designate which programs you would like your application to be sent to. You will have the ability to continue to designate programs after you have e-submitted your application.

Print

You will have the ability to print the coursework that you have entered, the other sections of your application, and the Transcript Request Form from the designated print area of the application before you e-submit the application to CASPA. You will also have the ability to print your paper reference requests from the Reference Forms section of the application. This form will be dynamically generated once you have entered the required information about your reference into the application.

Status

Use this section to view the status of your transcripts, tests and reference forms received by CASPA. Once you have e submitted your application and your application has been verified, you may view your GPAs and the dates your applications have been sent to designated programs.

Instructions

Use this section to access instructions for each of the application sections or use the instruction button available within each section.

Logout

This will close the application site.

FORGOTTEN PASSWORDS:

CASPA staff does NOT have access to your password information. To retrieve your password, please click "forgot password" under the login prompt. Please note that passwords and security question answers are case sensitive, so try several capital/lower case combinations. Also, please be certain you are attempting to log in to the 2012 portal (it should say 2011–2012 cycle at the top) and not the 2010–2011 portal. If you still cannot log into the portal, please e-mail CASPA a request to have your password reset along with your name and CASPA ID#. Your password will then be reset to a randomly generated password and your login information e-mailed to you. Once you login with this reset information, you will be able to change your password yourself to whatever you would like.

Instructions & FAQs > My Programs

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PRINT

CLOSE

In this section, you must indicate which schools you would like CASPA to send your application to. You can add as many programs as you like as long as their individual deadlines have not passed. Add a program by clicking blue plus sign next to "Update Designations" in the upper left hand corner. You should then select the check box to the left of each program you wish to apply to. You must select at least one program to submit your application to CASPA. If you have previously applied to any of the designated program(s), please indicate so using the check boxes provided on the right for the designated program(s) in question.

Consult the participating programs pages for program specific requirements. For course requirements and/or prerequisites, contact each program directly.

The fee for using CASPA is based upon the number of programs to which you choose to apply. Please see the "Application Fees" section of our FAQ for more detailed information.

You may edit your "My Programs" list until you e-submit your application. **Once you submit your application, you are committed to applying to the programs you have selected and NO programs can be removed. CASPA can NOT give a refund if a selection was made in error, nor can we transfer the payment to another designation.**

From the date your application is completed, it may take up to **FOUR WEEKS** to process and mail your application to your programs. All materials must be turned in to CASPA six weeks prior to your earliest deadline to ensure timely processing. **PLEASE RESEARCH ALL DEADLINE REQUIREMENTS PRIOR TO SUBMITTING YOUR APPLICATION.**

SUPPLEMENTAL APPLICATION LINKS:

Once you designate a program, some programs have provided a link to their Supplemental Application in the right-hand column by listing "YES →" Please click on the arrow link (→) to be taken to the program website to fill out the supplemental application. If a program requires a Supplemental Application but no arrow is provided, please go directly to the program website for instructions.

COMMON QUESTIONS:

Q: If the programs have different deadlines, will my application go out to all of them at once?

Q: Can I add more programs to apply to AFTER I submit my application?

Q: Can I apply to a program whose deadline has passed?

Q: My application was undelivered back to me to make changes. While it's open I would like to add more schools to apply to. Why can't I find the designations button?

MY TOOLS

- MY APPLICATION
- MY PROFILE
 - Account Information
 - Change Password
 - Change Security Question
 - Update AAMC ID
- PRINT APPLICATION
- MY MESSAGES
 - New Mail [1]

HELP

- FAQs
- Instructions
 - Before Applying
 - Participating Programs
 - Applicant Responsibilities
- CASPA Policies
- PAEA Home
- PAEA Program Directory
- Contact Us

Application > Contact Information

■ - Required Information

[INSTRUCTIONS FOR THIS SECTION](#)

Check if you have materials under another name

If so, indicate name
Last, First, Middle

Nickname

Preferred Mailing Address

Street 1 ■

Street 2
(e.g., apt #)

City ■

State ■

Zip Code ■
99999-9999

Country ■

Home Phone ■
999-999-9999

Work Phone
999-999-9999

Mobile Phone
999-999-9999

Permanent Address

Check if Permanent Address is the Same as the Preferred Mailing Address

Street 1 ■

Street 2
(e.g., apt #)

City ■

State ■

Zip Code ■
99999-9999

Country ■

Home Phone ■
999-999-9999

[CANCEL](#) [SAVE](#) [PRINT](#)

MY TOOLS

- MY APPLICATION
- MY PROFILE
 - Account Information
 - Change Password
 - Change Security Question
 - Update AAMC ID
- PRINT APPLICATION
- MY MESSAGES
 - New Mail [1]

HELP

- FAQs
- Instructions
- Before Applying
- Participating Programs
- Applicant Responsibilities
- CASPA Policies
- PAEA Home
- PAEA Program Directory
- Contact Us

Application > Personal Data

■ - Required Information

[INSTRUCTIONS FOR THIS SECTION](#)

Demographic Information

What is your Citizenship Status? ■

What is your Country of Citizenship? ■

Do you hold a Visa?

If you hold a Visa, please specify:

Physician Assistant students interact with patients from many backgrounds. Indicate any language(s) other than English in which you feel comfortable conversing.

In what state do you claim residency? ■

In what county do you claim residency? ■

Gender ■ Male
 Female
 Gender Variant
 Do Not Wish to Report

Date of Birth ■
MM/DD/YYYY

State of Birth ■

County of Birth ■

Country of Birth ■

Secondary School (High School) Name ■

Secondary School City ■

Secondary School State ■

Year of Graduation ■

Ethnicity, Race and Background

Physician Assistant programs fully recognize the importance of diversity in their student body and in the physician assistant work force. Accordingly, programs strongly encourage applications from persons from all socioeconomic, racial, ethnic, religious, and educational backgrounds and persons from groups underrepresented in health care.

Do you consider yourself to be of Hispanic origin? Yes, Spanish/Hispanic/Latino/Latina
 Please check all that apply below:

- Mexican, Mexican American, Chicano/Chicana
- Cuban
- Puerto Rican
- South or Central American
- Other Spanish culture or origin

If other, please specify:

- No, not Spanish/Hispanic/Latino/Latina

Which of the following best describe your race? Please mark one or more races.

- American Indian or Alaska Native

Please specify the name of your enrolled or principal tribe:

- Asian

Please check all that apply below:

- Asian Indian
- Cambodian
- Chinese
- Filipino
- Japanese
- Korean
- Malaysian
- Pakistani
- Vietnamese
- Other Asian

If other, please specify:

- Black or African-American

- Native Hawaiian or Other Pacific Islander

Please check all that apply below:

- Guamanian or Chamorro
- Native Hawaiian
- Samoan
- Other Pacific Islander

If other, please specify:

- White

Check if any of the following apply to you:

- I graduated from a high school from which a low percentage of seniors receive a high school diploma.
- I graduated from a high school at which many of the enrolled students are eligible for free or reduced price lunches.
- I am from a family that receives public assistance (e.g., Aid to Families with Dependent Children, food stamps, Medicaid, public housing) or I receive public assistance.
- I am from a family that lives in an area that is designated as a Health Professional Shortage Area or a Medically Underserved Area.
- I participated in an academic enrichment program funded in whole or in part by the Health Careers Opportunity Program.
- I am a high-school drop-out who received AHS diploma or GED.
- I am from a school district where 50% or less of graduates go to college or where college education is not encouraged.
- I am the first generation in my family to attend college (neither my mother nor my father attended college).

English is not my primary language.

By designating any of the above, you are considered to have met the criteria for educationally/environmentally disadvantaged as defined by the above guidelines.

To determine if you come from an economically disadvantaged background, you are asked to compare your parental family's size of household (number of exemptions listed on parent's Federal 1040 income tax forms) and adjusted gross income against the chart provided in the link below. The chart is based on 200 percent of Federal low-income poverty guidelines. You should use your parent's 2010 forms regardless of age.
Please [CLICK HERE FOR GUIDELINES](#).

Your parent's family income falls within the table's guidelines and you are considered to have met the criteria for economically disadvantaged.

Please check, if you agree:

What is the type of geographic area where you were raised?

Certifications

Highest Degree Earned To Date

Check if you have any professional certifications

Check if you have any professional registrations

Organization 1

Type of Certification/Registration

Date

MM/DD/YYYY

Certifying/Registering Organization

Organization 2

Type of Certification/Registration

Date

MM/DD/YYYY

Certifying/Registering Organization

Tests

Please indicate below the tests that you have taken, or plan to take. All official test scores, with the exception of the TOEFL, should be sent directly to the programs you are applying to.

GRC Taken Plan to take

ACT/SAT Taken Plan to take

AHPAT Taken Plan to take

TOEFL Taken Plan to take

MCAT Taken Plan to take

ISE

Taken Plan to take

If you have taken the GRE Exam, please list your scores here. You must also have official scores sent directly to the programs.

GRE Verbal

GRE Quantitative

GRE Analytical Writing

If you have taken the MCAT Exam, please list your most recent scores here. You must also have official scores sent directly to the programs.

MCAT Verbal Reasoning

MCAT Physical Sciences

MCAT Biological Sciences

MCAT Writing Sample

 CANCEL

 SAVE

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Application > Additional Information

Required Information

[INSTRUCTIONS FOR THIS SECTION](#)

Have you ever matriculated in or attended any PA education program? Yes No

Have you ever been disciplined for academic performance or conduct violations (e.g. academic probation, dismissal, suspension, disqualification, etc.) by any college or school? Yes No

Have you ever been convicted of a misdemeanor or felony? Yes No

Have you ever had any certification, registration, license or clinical privileges revoked, suspended or in any way restricted by an institution, state or locality? Yes No

If you answered Yes to any of the 4 previous questions, please provide a brief explanation.

600 character limit = approx. 100 words. Characters include spaces, carriage returns, numbers, letters, etc.

Have you had any US military experience? Yes No Currently Serving

AUTHORIZATION: Check to authorize CASPA to release information (including admissions status) to pre-professional health advisors to assist those advisors in counseling future applicants.

How did you first hear about the PA Profession/PA education?

What was the most influential factor in bringing you to the PA profession/PA education?

[CANCEL](#) [SAVE](#) [PRINT](#)

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Application > Health Related Training

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[ADD NEW ENTRY](#)

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Application > Narrative

■ - Required Information

[INSTRUCTIONS FOR THIS SECTION](#)

Personal Statement/Narrative. Please describe your motivation towards becoming a PA ■

5000 characters limit = approx. 625 words. Characters include spaces, carriage returns, numbers, letters, etc.

[X CANCEL](#) [SAVE](#) [PRINT](#)

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Application > Work and Volunteer Experiences

In this section you are to enter any of the following experiences:

- Patient Care Experience
- Other Health Care Experience
- Health Care Shadowing
- Research
- Community Service
- Other Work Experience
- Awards, Honors & Leadership

Be careful not to duplicate work experience hours in multiple sections. Report work experience in the section that **best describes** the type of experience. If the position duties encompass more than one section, enter the position in both sections and divide the hours and duties accordingly. (Example: a 40 hr/wk position with 10 hrs/wk of research and 30 hrs/wk of direct patient care would be entered under both research and patient care sections with the appropriate hours and duties listed within each section.) **Please be sure to read the instructions before entering your information.**

[+ ADD NEW ENTRY](#)

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Application > Institutions Attended

[INSTRUCTIONS FOR THIS SECTION](#)

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Application > College Degrees

Required Information

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[VIEW LIST](#)

Institution Attended

College	State	Start Date	End Date
UNIVERSITY OF SOUTH FLORIDA - TAMPA	Florida	January 2004	August 2011

Degree
If no Degree select "NO DEGREE"

Degree, if other:

Degree Status

Date Degree Earned or Anticipated:
Enter month Degree earned or expected, if applicable

Year
Enter year Degree earned or expected, if applicable

Major for Degree
Select course of study from the list that most closely matches your major

1st Major, if other:

Second Major or Minor for Degree
Select course of study from the list that most closely matches your major

2nd Major or Minor, if other:

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Application > Term Information

[VIEW COURSE LIST](#)

College:

Academic Status:

Term:

Term Type:

Year:

Session/Term Information Status: Completed Planned/In Progress

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Application > References

Required Information

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Reference Type: Paper
 Electronic
 For paper references, you must supply the Reference's mailing address below. For electronic references, the Reference's email address is required.

I waive my right of access to this reference: No
 Yes

Reference's Title (Dr., Mr., Ms., etc):

Reference's First Name:

Reference's Middle Name or Initial:

Reference's Last Name:

Reference's Occupation:

If other occupation, please specify:

Reference's Phone Number:
(xxx-xxx-xxxx)

Reference's Email Address:
Leave blank for paper reference

Confirm Email Address:

Reference's Street Address 1:

Reference's Street Address 2:

Reference's City:

Reference State:

Reference's ZIP:

Reference Country:

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Application > My Programs

[+](#) [x](#) UPDATE DESIGNATIONS

[FEE SCHEDULE](#)

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PLEASE NOTE: Once you designate a program, some programs have provided a link to their Supplemental Application in the right-hand column by listing "Yes →". Please click on the arrow link (→) to be taken to the program website to fill out the supplemental application. If a program requires a Supplemental Application but no arrow is provided, please go directly to the program website for instructions.

[PRINT](#)

About the Author

David E. Kotun, PA-C, MPAS is the Administrative Director of Clinical Education for the four Nova Southeastern University Physician Assistant Programs. His tasks involve, coordinating the clinical teams, rotations, computer tracking of clinical year students, and managing the student housing throughout the state. He has been in the current position for three years. Prior to that, he was the first Clinical Director for the Orlando Physician Assistant program at the program's startup. Prior, he was clinical faculty member at the University of South Florida College of Medicine for six years, teaching physician assistant, medical, nurse practitioner, medical, and clinical pharmacy students in the classroom and the family medicine clinic.

His Air Force career lasted twenty-seven years, beginning as a laboratory technician and a laboratory instructor at March A.F.B. in Riverside, California. From there, he went to the U.S.N. Nuclear Medicine School at Bethesda Naval Hospital in Bethesda, Maryland and served at David Grant U.S.A.F. Medical Center in San Antonio, Texas until 1983 when he was accepted into the U.S.A.F. Physician Assistant program at Sheppard A.F.B. in Wichita Falls, Texas. After his first duty assignment at Tyndall A.F.B. in Panama City, Florida, Professor Kotun and his family were sent overseas to England and Germany where he did family medicine at R.A.F. Bentwaters, United Kingdom, then to Sembach A.B.

and Ramstein A.B. Germany. He was a medical readiness instructor and evaluator as well as a North Atlantic Treaty Organization (N.A.T.O.) medical readiness inspector. He returned to Florida in 1998 as the clinical supervisor of the MacDill A.F. B. physician assistant program and retired in February 2000 as the interim primary care flight commander.

Professor Kotun graduated from the University of Oklahoma College of Medicine with a bachelor's degree as a Physician Associate in 1985, then from the University of Nebraska with a master's degree in Physician Assistant Studies in 1999. Prior education is an associate of science in Radiologic Technology from George Washington University in 1981 and he still holds an American Registry of Radiologic Technologists (A.R.R.T.) nuclear medicine certification. He has an associate of science in Laboratory Technology from the Community College of the Air Force awarded in 1982.

He has been on the Board of Directors for the Florida Academy for the last two years as the East Central Florida Regional Director. This is his second time on the Board of Directors. He has been a member of the Conference Planning Committee since 1999. He was also the Tampa, Florida area representative for the Florida Academy of Physician Assistants from 2001 through 2006. He is a Fellow Member of the Florida Academy of Physician Assistants, a Distinguished Fellow of the American Academy of Physician Assistants (AAPA), and a member of the AAPA Veteran's Caucus.

His office is located in Orlando and he resides in Kissimmee, Florida.