Bethel University

Spark

All Electronic Theses and Dissertations

2018

The Relationship of Underrepresented Minority Status With Choice Process When Considering the Physician Assistant Profession

Christina Hanson
Bethel University

Follow this and additional works at: https://spark.bethel.edu/etd

Part of the Educational Leadership Commons

Recommended Citation

Hanson, C. (2018). *The Relationship of Underrepresented Minority Status With Choice Process When Considering the Physician Assistant Profession* [Doctoral dissertation, Bethel University]. Spark Repository. https://spark.bethel.edu/etd/264

This Doctoral dissertation is brought to you for free and open access by Spark. It has been accepted for inclusion in All Electronic Theses and Dissertations by an authorized administrator of Spark.

The Relationship of Underrepresented Minority Status with Choice Process when Considering the Physician Assistant Profession

by

Christina Beth Hanson

A dissertation submitted to the faculty of Bethel University in partial fulfillment of the requirements for the degree of Doctor of Education

St. Paul, MN
2018

Approved by:

Advisor: Diane Dahl, Ph.D., RN

Reader: Amy Bronson, Ed.D., PA-C

Reader: Wallace Boeve. Ed.D., PA-C

© 2018
Christina B. Hanson
ALL RIGHTS RESERVED

Abstract

Representation of African Americans, Latinos, Hispanics, Native Americans, and Alaskan Natives in the Physician Assistant (PA) profession is not growing at the same rate as in the general population, leaving these groups underrepresented in the PA profession. To increase the diversity of the PA profession, the diversity of matriculating PA students must first increase. The purpose of this study was to investigate the choice process of underrepresented minority (URM) and non-URM applicants and matriculants to PA school, to identify trends in the choice processes of URM individuals considering the PA profession. In this quantitative, retrospective study, chi-square analysis was performed using data from the 2016-2017 Centralized Application Service for Physician Assistants (CASPA) and the 2017 Matriculant Student Survey (MSS). Chi-square analysis was used to identify dependent relationships between URM status and responses on CASPA and MSS items regarding choice process when considering the PA profession. Data analysis revealed that URM participants were significantly less likely to report learning about the PA profession from a friend or relative ($p<0.001$), parent ($p<0.001$), or personal healthcare provider ($p=0.004$). When matriculants were asked when they decided to become a PA, URM matriculants were significantly more likely to report that they decided after receiving an associate's degree ($p<0.001$) or after receiving a bachelor's degree ($p=0.005$) and significantly less likely to report that they decided during high school/before college ($p<0.001$). Finally, several significant differences were identified between URM and non-URM ratings of potential influences in their choice processes as either absent, positive, negative, or neutral.

Dedication and Acknowledgements

I would like to express my heartfelt gratitude to my dissertation advisor, Diane Dahl, Ph.D., for her wisdom, mentorship, and grace throughout my dissertation journey. A special thanks to Wallace Boeve, Ed.D., and Amy Bronson, Ed.D., who have been by my side since my first day in PA education. I could not have asked for a better committee of advisors, colleagues, and friends.

I would like to thank the Physician Assistant Education Association (PAEA) and the American Academy of Physician Assistants (AAPA) for their support of my project through the AAPA-PAEA Research Fellowship. Special thanks to all of my mentors and supporters through the AAPA-PAEA Research Fellowship, including David Keahey, Rick Dehn, Noel Smith, Donovan Lassard, Alicia Quella, and Virginia Valentin.

Throughout my doctoral journey, I was so blessed by my supportive colleagues, friends, and family. Your encouragement carried me through, and your patience for my frequent stress and absence made this possible. Thank you to my parents who have encouraged and guided me for the past 35 years. To my husband, Mark, and my children, Svea, Gunnar, and Torsten, I am overwhelmingly blessed by your love, patience, and encouragement.

Table of Contents

List of Figures 8

List of Tables 9

List of Abbreviations 10

Chapter 1: Introduction 11

Background to the Study 13

Problem Statement 18

Theoretical Framework and Choice Process 22

Purpose 27

Research Questions 27

Significance of the Study 28

Nature of the Study 29

Definition of Terms 30

Organization of the Remainder of the Study 31

Chapter II: Review of Literature 32

Introduction 32

Unequal Representation in Medicine 32

Disparities in Healthcare 34

Diversity to Improve Healthcare 36

Physician Assistant Program Admissions 42

Barriers for Underrepresented Minority Applicants 46

Strategies to Increase Diversity in PA Education 47

Influences and Choice Process 53

Summary 54

Chapter III: Methodology 56

Introduction 56

Research Questions 56

Hypotheses 57

Research Method and Design 58

Theoretical Framework for Methodology 58

Variables 60

Categorization of Variables 62
Instrumentation and Measures *63*
Populations *66*
Data Collection *66*
Research Question #1 67
Research Question #2 67
Research Question #3 67
Research Question #4 68
Data Analysis Procedure *68*
Limitations and Delimitations of Methodology *71*
Ethical Considerations *73*
Chapter 4: Results **75**
Introduction *75*
Research Questions *76*
Response Rate and Participant Demographics *76*
CASPA Data 76
Matriculating Student Survey 77
Research Question One *78*
Research Question Two *81*
Research Question Three *84*
Research Question Four *87*
Absent 90
Positive Influences 93
Negative Influences 95
Neutral Influences 96
Question Four Summary 99
Results Summary *100*
Chapter V: Discussion **103**
Overview of the Study *103*
Research Questions *104*
Major Findings *104*
Research Questions One and Two 104
Research Question Four 108
Research Question Three 112
Implications and Discussion *114*

Limitations *116*
Response Bias 116
Researcher Bias 116
Confounding Factors 116
Population limitations 117
Recommendations *117*
Concluding Comments *119*
References **120**
Appendix A: Copy of CASPA and MSS Survey Items for this Study **132**
Appendix B: CASPA Release, Privacy, and Data Policies **136**
Appendix C: PAEA Informed Consent for Participation in MSS **139**
Appendix D: Complete Listing of Items Included on MSS **143**
Appendix E: IRB Approval **181**
Appendix F: Confirmation of Authorization to Obtain CASPA and PAEA Data **184**
Appendix G: Total and Expected Counts for Negative Ratings on the MSS **187**

List of Figures

1. Hadinger's Conceptual Model of Minorities in Medical School Admissions
2. Categorization of Variables for Research Questions Two and Three
3. Categorization of Variables for Research Question Four
4. Synthesis of Responses for Research Questions One and Two
5. Synthesis of Responses for Research Question Four

List of Tables

1. Sample chi-square analysis of an option for research question number three
2. Categorization of 2016-2017 CASPA participants
3. Categorization of 2017 MSS participants
4. Where CASPA Participants First Learned About the PA Profession
5. Chi-Square Analysis of Research Question One Responses
6. Most Influential Factor Bringing CASPA Participants to the PA Profession
7. Chi-Square Analysis of Research Question Two Responses
8. When Matriculants Decided to Become a PA
9. Chi-Square Analysis of Research Question Three Responses
10. Summary of Responses Related to Research Question Four
11. Participants who Reported that Influences Were Absent
12. Chi-Square Analysis of Absent Factors
13. Participants who Reported that Influences Were Positive
14. Chi-Square Analysis of Positive Influences
15. Participants who Reported that Influences Were Negative
16. Participants who Reported that Influences Were Neutral
17. Chi-Square Analysis of Neutral Influences
18. Research Summary
19. Most Frequent Responses for Research Questions One and Two

List of Abbreviations

AAMC: Association of American Medical Colleges

AAPA: American Academy of Physician Assistants

APRN: Advanced Practice Registered Nurse

CASPA: Centralized Application Service for Physician Assistants

HCOP: Health Careers Opportunity Program

HRSA: Health Resources & Services Administration

MSS: Matriculating Student Survey

NP: Nurse Practitioner

PA: Physician Assistant

PT: Physical Therapist

PAEA: Physician Assistant Education Association

URM: Underrepresented Minority

Chapter 1: Introduction

The United States is becoming increasingly diverse in regards to race and ethnicity. However, representation of African Americans, Latinos, Hispanics, Native Americans, and Alaskan Natives in the Physician Assistant (PA) profession is not growing at the same rate, leaving these groups underrepresented in the PA profession. As of 2017, 60.7% of all Americans reported a single race of non-Hispanic white, 13.4% self-reported as Black or African-American, 18.1% as Hispanic or Latino, and 1.3% as American Indian or Alaska Native (United States Census Bureau, 2017). In contrast, in 2017, 87.3% of practicing PAs were non-Hispanic white, 3.0% reported as Black or African American, 5.3% as Hispanic or Latino, and only 0.4% as American Indian or Alaskan Native (AAPA, 2017). This same report from the American Academy of Physician Assistants (AAPA) looked at the demographics of practicing PAs who had graduated in 2015 or 2016 and found that the numbers have not changed significantly, and in the case of African Americans, representation decreased. Of practicing PAs who graduated in 2015 or 2016, 87.0% reported as non-Hispanic white, 1.9% as Black or African American, 5.7% as Hispanic or Latino, and 0.3% as American Indian or Alaskan Native (AAPA, 2017).

The lack of diversity in the PA profession has implications for both individuals, and the healthcare system as a whole. Many studies have shown that medical providers who belong to an underrepresented minority (URM) racial or ethnic group are more likely to provide care for medically underserved populations, which improves access to medical care (Coplan, Cawley, & Stoehr, 2013; Komaromy, et al., 1996; Muma, Kelley, and Lies, 2010; Rabinowitz, Diamond, Veloski, & Gayle, 2000). Additionally, the quality

of medical care has been shown to improve when a patients are the same race as their medical provider, particularly for patients in URM racial or ethnic groups (Cooper, et al., 2003; Eskes, Salisbury, Johannsson, & Chene, 2013, Institute of Medicine [IOM], 2004; King et al., 2004; Laveist, Nuru-Jeter, & Jones, 2003; Street, O'Malley, Cooper, & Haidet, 2008; Traylor, Schmittdiel, Uratsu, Mangione, & Subramanian, 2010). Finally, increasing the diversity of a class of medical students has been shown to improve the cultural competency of all members of the class, regardless of their racial or ethnic background (Saha, Guiton, Wimmers, & Wilkerson, 2008).

Evidence that increasing diversity among medical providers increases access to care, improves quality of care, and enhances the cultural competency of care creates some of the primary arguments for increasing the diversity within the PA profession. In addition to the evidence of improved care, increasing diversity aligns with commitments of national PA organizations to improve equity in the profession, by providing opportunities for traditionally underrepresented ethnic and racial minorities to enter the profession. Both the AAPA and the Physician Assistant Education Association (PAEA) have recognized the importance of improving care through increasing provider diversity, as well as an ethical responsibility of the profession to include historically underrepresented racial and ethnic groups (AAPA, 2018a; PAEA, 2017a).

Many potential factors lead to the disparity in representation of certain racial and ethnic groups in the PA profession. This study focused on the admissions process to PA school, particularly factors that influence an individual's decision to pursue the PA profession through application to PA school. Because all PAs must first graduate from an accredited PA school to become licensed, PA schools act as a gatekeeper to the

profession. Admission to PA school is the first step towards enrolling in a PA program, and an individual must first decide to apply to PA school before acceptance and matriculation. Therefore, understanding of the current influences on potential applicants as they considered application to PA school is essential. This study will examine factors that impacted URM and non-URM applicants and matriculants to PA school as they learned about and decided to pursue application to a PA program and the PA profession. By identifying possible differences in how URM and non-URM applicants and matriculants made their decision, stakeholders in the PA profession, including individual schools as well as national organizations, can better identify strategies for educating and recruiting URM applicants to increase diversity in the profession.

Background to the Study

The Affordable Care Act designated three primary care professions capable of providing healthcare: physicians, PAs, and nurse practitioners (NPs) (AAPA, 2018c). As nationally certified and state-licensed medical professionals, PAs can evaluate patients, implement treatment plans, and prescribe medication in all fifty states, the District of Columbia, US territories, and the uniformed services (AAPA, 2018c). As of December 2016, more than 115,000 certified PAs practiced in the United States, working in virtually all medical specialties (AAPA, 2018c). The PA profession originated in 1967 as a way to license army medics to practice medicine in the United States, to address the physician shortage at the time (PA History Society, 2017). This new career option provided a faster, less expensive route to a meaningful role in medicine for veterans. Currently, the terminal degree to become a PA is a master's degree (AAPA, 2018c). The average duration of PA programs in the United States is 27 months, following completion

of a bachelor's degree (AAPA, 2018c). After graduation from an accredited PA program, candidates must pass the Physician Assistant National Certification Examination (PANCE) to become certified, making them eligible for state licensure and practice (AAPA, 2018c).

Physician assistants provide vital services to patients and fill an important role in the healthcare system. Everett, Schumacher, Wright, and Smith (2009) found that participants living in rural areas were more likely to have a PA or NP as their primary care provider as compared to metropolitan (>50,000 people) or micropolitan (between 10,000 and 50,000 people) residents. They also found that patients who were female, who were younger, and those who either did not have insurance or were on public insurance were more likely to report a PA or NP as their primary provider. When assessing for overall health, the researchers found that overall health status of participants was equivalent for patients of PAs, NPs, and physicians.

A review of the National Ambulatory Medical Care Survey, conducted by Staton, Bhosle, Camacho, Feldman, & Balkrishnan, found that patients who lacked insurance were more likely to see a PA than those with private insurance (2007). In addition, patients in rural areas were 102% more likely to visit a PA than patients in urban areas, and nonwhite patients were more likely to see a PA than were white patients. These findings demonstrated that PAs fill gaps in access to healthcare by caring for traditionally underserved populations.

Surveys consistently show that patients who utilize PAs for their medical care report high levels of satisfaction (AAPA, 2014; Cipher, Hooker, & Sekscenski, 2006). In 2014, the AAPA commissioned Harris Poll to survey adult patients in the United States

regarding their perceptions of PAs and the healthcare PAs deliver (AAPA, 2014). The poll surveyed 1,544 adults over the age of 18, and 680 of those reported interacting with a PA in the previous year (AAPA, 2014). Of those who had interacted with a PA, 93% reported that they viewed PAs as trusted healthcare providers, and 93% reported a belief that PAs are going to be part of the solution to address the shortage of healthcare providers (AAPA, 2014). These findings support previous research by Cipher, Hooker, and Sekscenski (2006), who reviewed 146,880 responses to the Medicare Satisfaction Survey from 2000 and 2001. They found that satisfaction ratings were consistent among the three main provider types, physicians, PAs, and NPs, which remained even with corrections for health status changes, age, gender, and wait times.

In addition to the benefits for patients, certification as a PA creates the opportunity for meaningful employment and upward mobility for individuals. According to the United States Department of Labor, Bureau of Labor Statistics (BLS) (2018), the average hourly pay for PAs in the United States in 2016 was $49.79, and the mean annual wage was $101,480. The BLS (2018) reported that the job outlook from 2016-2026 is 37% growth, which is significantly above average in comparison with other tracked occupations. According to the AAPA (2018c), three quarters of PAs receive multiple job offers upon passing their initial licensing and certification exams, demonstrating demand for newly trained PAs. In their Occupational Handbook, the BLS (2018) estimated that between 2014 and 2024, the demand for PAs will grow 30%, which is much faster than the average for all occupations.

One reason for the projected demand for PAs is a looming physician shortage in the United States. In 2016, the Association of American Medical Colleges (Association

of American Medical Colleges [AAMC], 2016) published a report estimating that there will be a shortfall of up to 90,400 physicians in the United States by the year 2025, with up to 35,600 of those open positions in primary care. An updated version of this report was published in 2018, and in the two years since 2016 the estimated physician shortage increased to between 42,600 and 121,300 by 2030, with up to 49,300 physicians needed in primary care (AAMC, 2018). This projected shortfall is largely the result of an aging population in the United States, resulting in more senior patients, who have a higher per capita consumption of health care. In addition to the aging patient population, approximately one-third of the current physician workforce will be 65 or greater in the next decade, and the number of physicians choosing to retire will have a significant impact on physician supply (AAMC, 2018). Between 2002 and 2016 a trend also developed where physicians worked fewer hours than previous generations of physicians, reducing the amount of full-time equivalent (FTE) physicians.

The AAMC (2018) physician demand and shortage estimates were calculated based upon current utilization rates of healthcare, which means they did not account for populations that are currently underserved. The Health Resources and Services Administration (HRSA) defines medically underserved populations as "specific sub-groups of people living in a defined geographic area with a shortage of primary health services" (HRSA, 2016). Examples of populations that meet these criteria include patients who are homeless, low-income, Medicaid-eligible, Native American, and migrant farmworkers. According to a special analysis included in AAMC's report (2016), if underserved patient populations had barriers to access removed, the United States would need up to 96,000 more medical providers today to fill all of the gaps.

In contrast to the findings regarding physicians, the 2016 AAMC report found that the supply of PAs was growing faster than the anticipated need, based upon current utilization models. By the year 2025, the supply of PAs is projected to grow by about 50% (AAMC, 2018; Hooker and Muchow, 2014). According to the Centralized Application Service for Physician Assistants (CASPA), the number of applicants to PA programs rose 10% between the 2014-2015 and 2015-2016 cycles and increased another 4.4% from 2015-2016 to 2016-2017 (CASPA, 2017b). In 2016, the AAMC report summarized these statistics by stating that there will be more PAs than what will be needed in the future. However, the report did not include any projections demonstrating how PAs could move into roles currently filled by physicians to help alleviate the projected physician shortage (AAMC, 2018).

In the 2018 updated report, the AAMC changed language around the ability of advanced practice registered nurses (APRNs) and PAs to help alleviate the shortage of medical care providers. The 2018 AAMC report included a new section that analyzed the impact of APRN and PA utilization on vacant physician positions. The 2018 AAMC report stated that no current literature exists to identify the percentage of open physician positions that could be filled by APRNs and PAs. However, according to the AAMC APRN and PA utilization projections, "each additional APRN or PA beyond the supply needed to maintain current staffing patterns will ease demand," (2018, p. 21) and in primary care PAs could ease provider demand as much as 50%.

Sargen, Hooker, and Cooper (2012) also performed a projection of provider shortages to 2025 and found that even if the supply of PAs and NPs continues to grow at the current rate, an overall shortage of medical providers will still exist by 2025. They

concluded that more providers would be needed, and the current rate of growth of PAs and NPs is not sufficient to fill the gap, although PAs and NPs are crucial to addressing the provider shortage problem.

The PA profession is growing, providing meaningful career opportunities for individuals to work and fill critical needs in the healthcare system. Unfortunately, the demographics of PAs show that URM racial and ethnic groups in the United States continue to be underrepresented in the PA profession. The proposed study attempted to address the issue of the low proportions of URM applicants to PA school by better understanding how they decide to apply, in an effort to understand the choice process of URM applicants to PA school.

Problem Statement

The United States population is becoming increasingly diverse in regards to race and ethnicity. As stated in the introduction, in 2017, 60.7% of Americans reported a single race of non-Hispanic white, 13.4% self-reported as Black or African-American, 18.1% as Hispanic or Latino, and 1.3% as American Indian or Alaska Native (United States Census Bureau, 2017). However, based upon current trends, projections estimate that by the year 2044, over fifty percent of Americans will belong to a minority group defined as any group other than non-Hispanic white (Colby & Ortman, 2015). Additionally, by the year 2060, almost twenty percent of the population will be foreign born (Colby & Ortman, 2015). As the racial and ethnic composition of the United States changes, the PA profession must adapt and address the changing needs of the country's healthcare system.

To monitor trends in the PA profession, as well as the ability of the PA profession to address healthcare needs in the United States, PAEA administers several surveys on a regular basis. One specific survey that is administered on a yearly basis to monitor trends among the students enrolling in PA school is the Matriculating Student Survey (MSS) (PAEA, 2018a). The MSS is sent annually to all PA students beginning their first year of PA school, in an effort to aggregate information about all PA students who matriculate in a given year. The survey includes demographic questions, as well as items asking matriculants about their educational background, perceived social support, financial situation, and factors which impacted their decision to apply to and enroll in a PA program. According to the 2016 MSS (PAEA, 2017b), 84.3% of students who entered PA school in 2016 were white, as opposed to the general population where the white segment of the population was 61.3%. In contrast, only 3.0% of matriculants self-reported as multi-racial, 2.6% as Black or African American, 8.3% as Hispanic, Latino, or Spanish, and 0.1% as American Indian or Alaskan Native. Although the self-reporting of multi-racial makes the statistics less precise, the discrepancy with the general population remains clear. Representation of URM individuals in PA education has not changed significantly in the last few years. In the 2012-2013 matriculating class, 2.83% of PA school applicants identified as Black or African American, 7.35% as Hispanic, and 0.21% as American Indian (CASPA, 2017a). The demographics from the 2016-2017 applicant pool have not changed significantly since 2012-2013, perpetuating the problems related to a lack of diversity in the PA profession.

One possible reason for the underrepresentation of certain minority groups in PA education is the racial composition of the pool of individuals who choose to apply to PA

school. Application to PA school is the first step in the "pipeline" to PA practice. Several events must occur for someone to become a practicing PA. An individual must first apply, then matriculate into an accredited PA program. Following successful completion of the program, that individual must then pass their certification examination, and obtain state licensure before practicing medicine. Understanding the pipeline to PA practice is important, as each step can create challenges for an individual wishing to become a PA. Because application to PA school is the first step in the pipeline, the demographic composition of the applicant pool for PA programs has a significant impact on the demographics of the profession.

The CASPA 2015-2017 Applicant Data Comparison (CASPA 2017b) provides a compilation of the demographic data of almost all applicants to PA school in the United States between 2015 and 2017. Review of this CASPA data shows that the composition of the applicant pool played a role in the lack of diversity of admitted classes during that timeframe. Between the 2015-2016 and 2016-2017 application cycles, 0.3% of applicants identified as American Indian, 6.2% as Black or African American, and 10.41% as Hispanic, indicating that all of these racial and ethnic groups were underrepresented in the applicant pool. The rates of representation for URM applicants were disproportionately low as compared to the general population in the United States in 2017 (United States Census Bureau, 2017), but were higher than the rates of representation in the matriculating cohort of PA students in the United States in 2017 (PAEA, 2017b). The lower representation of URM individuals among matriculants to PA school as compared to applicants suggests that barriers exist in the admission process for URM applicants. Disagreement persists as to which factors present the greatest challenges to URM

admission to PA school (Agrawal, Vlaicu, & Carrasquillo, 2005; Alexander, Chen, & Grumbach, 2009; DiBaise, Salisbury, Hertelendy, & Muma, 2015; Freeman, Landry, Trevina, Grand, & Shea, 2016; Hadinger, 2017). One factor that may create a barrier to URM applicants is the competitive nature of PA school admissions. In the 2016-2017 application cycle, 25,593 individuals applied to PA schools, and of those applicants, only 31.7%, or 8,106 students, ultimately enrolled in a PA program (CASPA, 2017d). With overwhelming numbers of qualified applicants, adjusting admissions protocols to improve diversity may not seem important, or even feasible for many schools.

Data from PAEA demonstrates that URM applicants are less likely than non-URM applicants to be accepted into PA school. Compounding this disparity, the relative representation of URM groups in the overall applicant pool for PA school is lower than that of the general population in the United States (CASPA, 2017d), suggesting that URM students are less likely to apply to PA school than non-URM students. To date, no specific research has been done to examine the choice process of URM students as they consider pursuing the PA profession through application to PA school. Understanding of the factors that affect decision making among potential applicants to PA school is imperative, particularly for URM populations. This study examined the choice processes of PA school applicants and matriculants, to identify factors that influenced their decision to apply to PA school. Additionally, the responses of URM and non-URM applicants and matriculants were compared to look for trends and differences in each group's choice process.

Theoretical Framework and Choice Process

The choice process used by prospective students as they select educational institutions and career paths has been studied since the late 1900s, resulting in several theories related to the processes and influences involved in these decisions. Hossler and Gallagher (1987) proposed a model of undergraduate student college choice comprised of three discreet phases: predisposition, search, and choice. Predisposition includes student aspiration, expectations, or plans for college, which can be strongly impacted by family background. In fact, Hossler and Gallagher found that parental encouragement and support was the most important contributor to a student's aspirations for postsecondary education. The search phase was constructed of several decisions including the methods that students use to gather information about colleges and financial aid. The final phase, the choice phase, was defined as the process of actually choosing a college and enrolling. Hossler and Gallagher found that the choice phase was primarily influenced by peers, high school teachers, and school counselors, unlike the earlier phases which are generally influenced by parents and family.

The model proposed by Hossler and Gallagher (1987) suggests that enrolling in an undergraduate school happens following a typical pattern of choices, informed by predictable patterns of influences. Following this model, several researchers have put forth theories about how these influences may vary depending upon an individual's background. One of the most widely accepted theories regarding patterns of influences is the student choice construct (Paulsen & St. John, 2002; St. John & Asker, 2001).

Paulsen and St. John (2002), and St. John and Asker (2001) defined the student choice construct, positing that educational attainment varies across racial and ethnic

groups as a result of habitus, a term credited to Bourdieu and Passeron (Bourdieu & Passeron, 1977). Bourdieu and Passeron described habitus as a system of class-specific dispositions and tendencies that shape an individual's actions and decisions. They theorized that society is structured so that these characteristics tend to reproduce and perpetuate themselves within groups of people, including groups based upon social class, religion, nationality, race, ethnicity, education, etc. Bourdieu and Passeron proposed that a person's habitus includes virtually every aspect of how they interact with others, including body language and posture, patterns of perception and classification, mental habits, and ultimate action. The theory of habitus has been criticized as being overly deterministic, but is widely cited in educational literature, and is one of the most common theories used to explain the longstanding persistence of social inequality (Edgerton & Roberts, 2014). Paulsen and St. John (2002) and St. John and Asker (2001) are widely credited with defining how the concept of habitus manifests itself in education. Their student choice construct states that an individual's choices regarding undergraduate schools and enrollment reflect their "situated context," and that options and pathways to undergraduate enrollment are highly individualized based upon each student's habitus and circumstances (Paulsen, 2014, p. 116).

Based on the research of St. John and colleagues (Paulsen & St. John, 2002; St. John & Asker, 2001), Perna (2004) looked at post-baccalaureate programs and further clarified the choice process of students considering graduate education, largely related to social and cultural capital. Based upon this and previous research, Perna later proposed four primary contexts which can influence the choice process of students: the student's school and community, the habitus of the student, the higher education system, and the

broader social, economic, and policy environment (Perna, 2006). Perna's research showed that an individual's contexts, including gender, race, and ethnicity, influence his or her decision to pursue a professional degree program. For example, she found that among women, identifying as African American was related to increased likelihood of pursuing a professional degree. However, for men, identifying as African American was unrelated to the odds of pursuing a professional degree. This model suggested that influences on the choice process vary significantly depending upon multiple factors, including gender, race, and ethnicity.

Recently, Hadinger (2017), utilized Perna's model to examine the choice process in applicants to medical school. She utilized the theories of Hossler and Gallagher (1987), Bourdieu and Passeron (1977), St. John (Paulsen & St. John, 2002; St. John & Asker, 2001), and Perna (Perna, 2004; Perna, 2006) to develop a qualitative study to further define potential influences on the choice process of potential medical school applicants. Hadinger interviewed URM medical students and asked about positive and negative influences on their application processes. The results of her qualitative research supported previously described theories, as URM students in her interviews identified guidance and social support, in addition to financial and academic factors as primary influences on their choice process. When discussing barriers, many of the URM students cited a lack of guidance and social support as the primary barriers in their process.

Based on the results of her interviews, Hadinger (2017) proposed a conceptual model to describe URM applicants' experiences in the admissions process for medical school, in an effort to identify more effective strategies for recruitment and retention of URM medical students. Her conceptual model (Figure 1) is framed using Hossler and

Gallagher's (1987) three-phase model of school choice, including predisposition, search and application, and choice. Within each of these phases, Hadinger proposed specific influences that are likely to shape that phase. Predisposition is impacted by motivators such as perceived fit, experience or knowledge, encouragement and role models, desire to help others, perceived benefits, and interest in science. The search/application phase is influenced by barriers and supports including access to information, guidance, social support, finances, academics, and persistence. Choice of a program is ultimately determined by the feedback of acceptance or rejection. In any of these phases, influences can positively or negatively affect applicants, and the absence of certain influences can create a barrier as well.

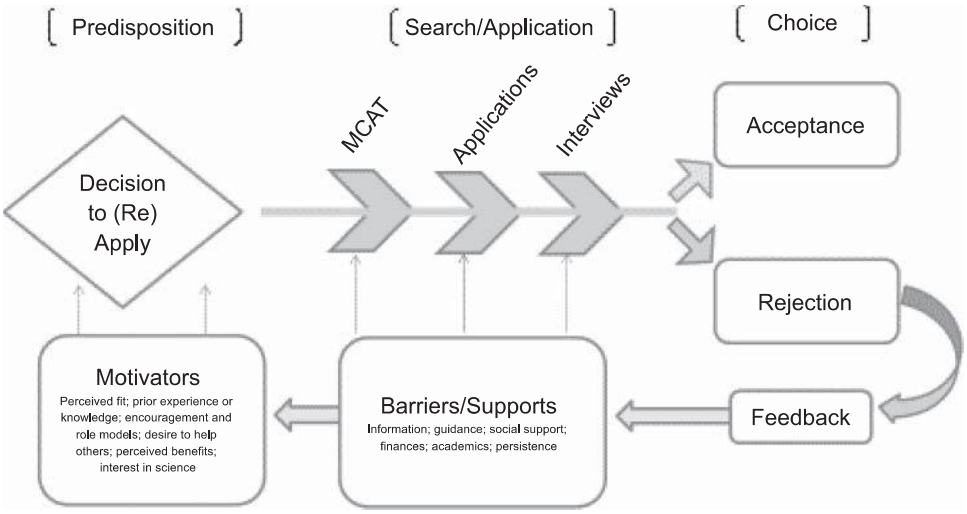

Figure 1. Hadinger's Conceptual Model of Minorities in Medical School Admissions (Hadinger, 2017)

In regards to PA education, very little research has been done on the choice process applicants use when deciding to apply to PA school. Klingler, Kaylor, Johannsson, and Schaat (2014) discussed the influences on student selection of a particular PA school, although this study did not consider race or ethnicity as a factor. A

recent study by Coplan, Bautista, and Dehn (2018), examined how specific characteristics of PA programs correlate with the diversity of their student body. The report contained descriptive statistics demonstrating that diversity has recently decreased in PA education, particularly for private universities and masters level programs. They also found that PA programs in the Western United States had the highest percentage of Hispanic students, and programs in the Southern United States had the highest proportion of black students. This study demonstrated that a variety of program-specific characteristics may influence students' decisions to enroll, but further research is needed to understand potential applicants' perceptions of these factors, and the influence various program characteristics have on choice process.

The student choice construct (St. John and Paulsen, 2002; St. John and Asker, 2001) was applied to the work of Perna (2006) and Hadinger (2017) and used in the development of the research questions for this study. Both Perna and Hadinger built upon the premise that potential applicants make their decision to apply to a school or professional program through a choice process, and they further clarified that the process can be influenced by many different sources including input from school officials, family, and friends, finances, and school characteristics. Additionally, both Perna and Hadinger found that the ways these influences ultimately impact an individual's choice process can vary significantly based on that person's gender, race, ethnicity, and social context. This study was designed to expand on their findings and examine how potential influences impacted the decision-making processes of recent applicants and matriculants to PA school, in an effort to expand understanding of the choice process for PA school, particularly for URM applicants.

Purpose

The purpose of this study was to examine the choice process of URM and non-URM applicants and matriculants as they considered the PA profession and application to PA school.

Research Questions

This study investigated the following research questions:

1. What difference, if any, exists between how URM and non-URM PA school applicants first learned about the PA profession?

   $H1_0$: No differences exist between how URM and non-URM PA school applicants first learn about the PA profession

   $H1_1$: Significant differences exist between how URM and non-URM PA school applicants first learn about the PA profession

2. What difference, if any, exists between URM and non-URM PA school applicants, in what they report as the most influential factor in bringing them to the PA profession/PA education?

   $H2_0$: No differences exist between URM and non-URM PA school applicants, in what they report as the most influential factor in bringing them to the PA profession/PA education

   $H2_1$: Significant differences exist between URM and non-URM PA school applicants, in what they report as the most influential factor in bringing them to the PA profession/PA education

3. What difference, if any, exists between when URM and non-URM PA school matriculants definitely decided to become a PA?

$H3_0$: No differences exist between when URM and non-URM PA school matriculants ultimately decide to become a PA

$H3_1$: Significant differences exist between when URM and non-URM PA school matriculants ultimately decide to become a PA

4. What differences, if any, exist between URM and non-URM PA school matriculants, in how they report various factors as absent, a negative influence, a positive influence, or neutral in their choice process when deciding to become a PA?

   $H4_0$: No differences exist between URM and non-URM PA school matriculants, in how they report various factors as absent, a negative influence, a positive influence, or neutral in their choice process when deciding to become a PA

   $H4_1$: Significant differences exist between URM and non-URM PA school matriculants, in how they report various factors as absent, a negative influence, a positive influence, or neutral in their choice process when deciding to become a PA

Significance of the Study

Currently, no research specifically addresses the choice process of URM students considering PA school. Hadinger (2017) recently identified factors that influence the choice processes of URM medical school applicants, providing some framework for examining PAs school applicants. The majority of research regarding barriers to URM student enrollment in PA school has been conducted by interviewing and surveying PA

program directors, faculty, and admissions staff about their perceptions. This study adds the unique and crucial perspective of URM students.

Additionally, this study included PA school applicants and matriculants, who had successfully navigated the process of applying to PA school. This methodology was based on Harper's anti-deficit achievement theory (2010). Much of the previous research done with URM medical students had been with aspiring students, still in their undergraduate years. By asking participants who had successfully applied and matriculated to PA school to reflect on their process, important information was gleaned concerning how to assist future applicants.

Finally, this study aimed to assist PA programs and educators in developing appropriate strategies to recruit diverse classes of PA students. By assessing the timeline in which URM and non-URM applicants and matriculants decided to pursue the PA profession, educators can improve the timing and delivery of support and information. Information about where URM students are likely to find positive and negative support is also helpful as PA educators work to improve recruitment initiatives.

Nature of the Study

In this quantitative, retrospective study, existing CASPA and MSS data was obtained from PAEA for analysis to address the research questions for this study. The data from CASPA and the MSS was collected through surveys of the entire population of PA school applicants and matriculants respectively, providing a comprehensive view of the demographics of these populations. Both sources also collected detailed information regarding choice processes of participants when considering the PA profession.

Definition of Terms

The following definitions were used and applied for the purposes of this study.

American Academy of Physician Assistants (AAPA)

The national professional society for PAs in the United States (AAPA, 2018a).

Applicant

An individual who completes and submits a formal application, in this case to a recognized PA school.

Centralized Application Service for Physician Assistants (CASPA)

The web-based application system established by PAEA, where applicants can complete a single PA school application, and submit it to any participating PA program (CASPA, 2018).

Matriculant

An individual who has been accepted to PA school, and has then registered and started courses in that school.

Physician Assistant Education Association (PAEA)

The national organization representing PA educational programs in the United States (PAEA, 2018b).

Underrepresented Minority (URM)

As defined by the AAMC (2003), "…racial and ethnic populations that are underrepresented in the medical profession relative to their numbers in the general population." This study will define URM applicants and matriculants as those who identify as black or African American, Hispanic or Latino, or American Indian or Alaska Native.

Organization of the Remainder of the Study

Chapter two will detail a review of the current literature related to needs and trends in the PA profession, PA school admissions processes, and URM choice process related to medical and PA school. The research design, methods, limitations, and ethical considerations will be explained in chapter three. Chapter four details the analysis of the data provided by PAEA and CASPA. The general conclusions, implications, and recommendations for future research are discussed in chapter five.

Chapter II: Review of Literature

Introduction

The first chapter of this study provided some background information to the problem of unequal representation of URM PA students and practicing PAs. This chapter synthesizes current literature assessing trends and needs in medicine related to diversity, the PA education admissions process, and URM choice process regarding medical and PA school.

Unequal Representation in Medicine

In regards to physician representation, the AAMC defines underrepresented in medicine as, "…racial and ethnic populations that are underrepresented in the medical profession relative to their numbers in the general population" (AAMC, 2018). According to the AAMC, populations currently considered underrepresented in medical school and medicine are African Americans, Mexican-Americans, Native Americans, and mainland Puerto Ricans. When discussing this study and the results, the term URM refers to individuals who self-identified in CASPA or the MSS as black or African American, Hispanic or Latino, and American Indian or Alaska Native. Throughout the literature review, terminology for each racial and ethnic group varies slightly, to accurately reflect the terminology used in each of the published studies being reviewed.

The AAMC does not include physicians of Asian descent in their definition of underrepresented in medicine. The rationale for not including Asians in the AAMC definition is that Asian physicians comprise a proportion of the total physician population similar to, or greater than, their representation in the general population. Therefore, they are not statistically underrepresented in the medical profession. Similarly, Asian PAs are

not considered underrepresented in the PA profession, as demonstrated by the fact that 9.3% of students who enrolled in a PA program in the 2016-17 class self-identified as Asian (CASPA, 2017d), in comparison to 5.7% of the national population that identified as Asian to the United States Census Bureau (United States Census Bureau, 2016). Therefore, respondents who identified as Asian on CASPA or the MSS were included in the non-URM group for data analysis in this study.

As stated in the introduction, the proportion of URM students applying to PA school has changed very little over the last few years (CASPA, 2017b), perpetuating the problem of inequity in the ethnic and racial diversity of the PA profession. In 2015, the Center for Health Workforce Studies at George Washington University published a report, which detailed recent shifts in racial and ethnic diversity for approximately forty health related occupations. The report found that the percentage of white PAs in the United States increased by 1.2% between 2004 and 2013, with non-Hispanic African Americans being most negatively impacted, with a 5.6% decrease in representation during the same timeframe (Snyder, Stover, Skillman, & Frogner, 2015). This overall decrease in the representation of African Americans in the PA profession correlated to an annual decrease of 0.495%, which was the highest rate of loss among all forty professions that the study examined.

These concerning trends have occurred despite awareness and action by the PA profession's national organizations over the last decade. The AAPA (2018a), the national organization for PAs, has four core values which are listed on their website: leadership and service, unity and teamwork, accountability and transparency, and excellence and equity. The fourth value of excellence and equity is further defined with the statement,

"We commit to the highest standards and seek to eliminate disparities and barriers to quality healthcare."

The vision of the PAEA is simply, "Healthcare for all" (PAEA, 2018b). In pursuit of this vision, each year the PAEA establishes an advocacy agenda to guide communication and partnerships with professional, governmental, and local stakeholders in the healthcare system. In the 2017-2018 PAEA Advocacy Agenda, one of the primary agenda items is student support, specifically to, "broaden access to the PA profession for veterans, diverse and/or disadvantaged applicants and students, and, in particular, students with strong backgrounds in rural and underserved communities" (PAEA, 2017a). In addition, PAEA has a Diversity and Inclusion Mission Advancement Commission (DIMAC), a working group of PA educators and stakeholders who collaborate to create educational materials and other tools to improve diversity in PA education (PAEA, 2017c). Despite awareness by leaders of the PA profession, representation of URM groups in the profession has not increased in recent years. The current study was intended to fill a gap in knowledge about best practices for recruiting URM applicants and to reverse the recent trend of decreasing diversity in the profession.

Disparities in Healthcare

The 2015 National Healthcare Quality and Disparities Report (United States Department of Health and Human Services, 2015) found that although the overall health of the American population has improved in recent years, minority populations continue to lag behind whites in many aspects of healthcare. Overall, they found that patients who belonged to racial and ethnic minority groups had lower access to care and received lower quality of care. LeBrun and Shi (2011) reviewed data from the Joint Canada-US

Survey of Health, which included more than 6,000 non-elderly adults in the United States and found that foreign-born adults in the United States were 48 percent less likely than native-born adults to have seen a medical provider in the preceding 12 months. The disparity was even greater for foreign-born non-white participants. Foreign-born Hispanics had 55 percent lower odds of having a regular medical provider than native-born non-Hispanic white patients.

A recent poll conducted by NPR, the Robert Wood Johnson Foundation, and the Harvard T.H. Chan School of Public Health (2017) surveyed 3,453 adults, including 802 African American participants, regarding their experiences with discrimination. The study revealed many issues with perceived discrimination. In the poll, 22% of African Americans reported that that they had avoided seeking healthcare, even when in need, due to fear of discrimination. Additionally, 32% of African Americans stated that they had experienced discrimination when going to a doctor or health clinic.

In addition to lower access to care and concerns about discrimination, several studies have demonstrated that URM patients have poorer health outcomes than their white peers (Denu, et al., 2016; Hauch, Al-Qurayshi, Friedlander, Kandil, 2014; Magnani, Norby, Agarwal, Soliman, Chen, Loehr, Alonso, 2016). Recent research in this area includes a study which reviewed 62,722 thyroid procedures in the Nationwide Inpatient Sample (NIS) from 2003 to 2009 (Hauch, Al-Qurayshi, Friedlander, Kandil, 2014). The NIS data showed that black and Hispanic patients were less likely to have access to high volume thyroid surgeons and facilities, leading to increased complications and longer lengths of stay in the hospital following surgery for these groups of patients. Another study of 15,080 patients with atrial fibrillation found that black patients were

more likely to have a stroke, heart failure, or congestive heart disease in the following years, with significantly higher mortality rates than white patients in the same cohort (Magnani, Norby, Agarwal, Soliman, Chen, Loehr, Alonso, 2016). Another 2016 study of 107 patients with inflammatory breast cancer found that African American and Hispanic patients were significantly more likely to be receiving treatment that did not meet current guidelines published by the National Comprehensive Cancer Network (Denu, et al.).

These studies provide just a few examples of poor health outcomes that disproportionately affect URM patients. These poor outcomes, in addition to the evidence of poor access to care for URM patients, and the frequency of perceived discrimination against URM patients, demonstrate the need for medical providers who will care for these underserved populations in a culturally-competent, non-discriminatory manner.

Diversity to Improve Healthcare

In 2004, the Institute of Medicine (IOM) published a study that linked disparities in care with the perceived ethnicity of patients. The report, titled "In the Nation's Compelling Interest: Ensuring Diversity in the Health Professions," also concluded that discordance of culture or ethnicity between a provider and their patient led to a decrease in the quality of care. Additionally, the IOM's (2004) research confirmed previous studies demonstrating that racial and ethnic minority healthcare providers are more likely to serve underserved medical communities and that racial and ethnic minority patients report higher satisfaction with minority healthcare providers. The IOM report also found that minority healthcare providers help reduce cultural and linguistic barriers to care and that diversity in healthcare training programs is associated with better educational

outcomes for all students enrolled. This section will examine these findings and demonstrate that research continues to support these claims.

A primary argument for increasing diversity among healthcare providers is the evidence that increased diversity improves access to care for patients. Multiple studies have demonstrated that medical providers who belong to a URM group are more likely to choose to practice medicine with medically underserved populations, improving access to care (Coplan, Cawley, & Stoehr, 2013; Komaromy et al., 1996; Muma, Kelley, and Lies, 2010; Rabinowitz, Diamond, Veloski, & Gayle, 2000). Rabinowitz, Diamond, Veloski, & Gayle (2000) surveyed a random sample of 2,955 allopathic and osteopathic generalist physicians who graduated from medical school between 1983 and 1984 to evaluate possible predictors of the physicians' care for underserved populations. They identified four common characteristics of generalist physicians who chose to care for underserved populations: being a member of a minority group, having participated in the National Health Service Corps, having a strong interest in practicing in an underserved area prior to attending medical school, and growing-up in an underserved area. Muma, Kelley, and Lies (2010) designed a similar study to identify common characteristics of PAs working with underserved populations. They surveyed a random sample of 10,500 PAs and found that the PAs most likely to care for underserved populations and/or work in primary care were those who were older, married, low income, and URM.

These findings were confirmed in 2013, when Coplan, Cawley, and Stoehr examined the characteristics of PAs working in primary care. This study utilized data from the 2009 AAPA Annual Census Survey, which surveyed all practicing PAs in 2009, with 19,608 of the 72,433 potential respondents choosing to participate. The researchers

found that the proportion of PAs going into primary care was steadily decreasing. When looking at personal characteristics of PAs in family practice, their results were virtually identical to Muma, Kelly, and Lies (2010), with the addition that Hispanic PAs were significantly more likely than all other groups to choose to practice in primary care than their Caucasian counterparts. Through the past twenty years, studies have consistently shown that URM medical providers, both physicians and PAs, are more likely to practice in underserved areas and to work in family practice (Coplan, Cawley, & Stoehr, 2013; IOM, 2004; Komaromy et al., 1996; Muma, Kelley, and Lies, 2010; Rabinowitz, Diamond, Veloski, & Gayle, 2000). By increasing the proportion of URM PAs, the profession can increase the number of providers willing to serve patients who desperately need them.

The case for increasing diversity in medicine can also be made by looking at the benefits of race-concordant and language-concordant care. Race-concordance is defined as a perceived similarity in race between a patient and their medical provider (Cooper, et al., 2003). Language-concordant care is when a provider speaks the patient's native language and does not require the use of an interpreter (Eskes, Salisbury, Johannsson, & Chene, 2013). Studies have demonstrated that patient-provider relationships are stronger, and patients report higher patient satisfaction and trust when receiving race-concordant and/or language-concordant care (Cooper, et al., 2003; Eskes, Salisbury, Johannsson, & Chene, 2013, Institute of Medicine [IOM], 2004; King et al., 2004; Laveist, Nuru-Jeter, & Jones, 2003; Street, O'Malley, Cooper, & Haidet, 2008; Traylor, Schmittdiel, Uratsu, Mangione, & Subramanian, 2010).

Cooper, et al. surveyed 252 adult medical patients, including 142 African-American patients and 110 white patients, before and after receiving care from a physician in a variety of primary care practices (2003). The researchers asked participants about their satisfaction with their care, and their perception of the physician's participatory decision-making skill. They found that race-concordant visits were longer and resulted in higher ratings by patients than did race-discordant visits.

A 2008 report confirmed these findings through a cross-sectional study of 214 patients and 29 primary care physicians from 10 different clinics (Street, O'Malley, Cooper, & Haidet). Patients were surveyed regarding their perceived similarity to their physician, their levels of satisfaction, their trust, and their intent to adhere to treatment. The researchers found that the physician-patient relationship was stronger when patients perceived themselves as similar to their physicians in regards to personal beliefs, values, communication, race, and ethnicity. Minority patients generally reported feeling less similar to their doctors during race-discordant visits than did white patients who were cared for by minority physicians, which suggested that race-discordance is more concerning for minority patients than white patients. In all groups, the perceived personal similarity between the patient and their physician was linked with higher ratings of trust, satisfaction, and intention to adhere to treatment, which demonstrated the importance of race-concordant care to all patients.

Eskes, Salisbury, Johannsson, and Chene (2013) examined the importance of language-concordant care by PAs. For their study, the researchers distributed a survey to 100 Spanish-speaking Hispanic patients in San Bernardino, California, asking them about language-concordance with their providers, as well as satisfaction with their care. On the

survey, 97% of respondents indicated that they experienced increased satisfaction with their medical care when their providers also spoke Spanish, and 83.7% reported that it mattered to them that their provider speak Spanish fluently.

These studies regarding patients' perceptions of their care, and their satisfaction with their provider are important, because patient satisfaction and trust have been associated with improved continuity of care and adherence to treatment (Bearder, Carter, & Harve, 2013, Fiscella et al., 2004). In addition to studies which confirm a perception of better care and satisfaction by patients receiving race-concordant and language-concordant care, several studies have shown that patients have objectively better medical outcomes when receiving race-concordant care (King et al., 2004; Laveist, Nuru-Jeter, and Jones, 2003; Traylor, Schmittdiel, Uratsu, Mangione, & Subramanian, 2010). Laveist, Nuru-Jeter, and Jones (2003), examined data from the 1994 Commonwealth Fund Minority Health Survey (MHS), which was a phone survey of 2,720 adults who comprised a representative sample of adults living in the United States. Their analysis found that patients who were of the same racial or ethnic group as their provider were more likely to utilize necessary health services, and less likely to delay seeking medical care when care was needed. The results were true even after adjusting for health status and other possible confounding factors.

King et al. (2004) found that race-concordance was associated with earlier initiation of protease inhibitors for HIV patients. King's study was conducted to address the disparities in mortality rates between African American and white patients, as African American patients at that time were much more likely to die from HIV and AIDS than white patients. King and colleagues looked at data from the HIV Cost and Services

Utilization Study, a cohort study of HIV-infected adults, performed through a nationally representative sample of 2,267 individuals. They found that the 341 African American patients with white providers reported the lowest access to care, and they received protease inhibitors later than white patients with white providers, or African American patients with African American providers.

A larger study of 131,277 adult diabetic patients in California (Traylor, Schmittdiel, Uratsu, Mangione, & Subramanian, 2010) examined the effects of race-concordance on medical care. After looking at clinical data, race and ethnicity of patients and providers, and patient and physician controls, they found that race-concordance for African American patients and language-concordance for Spanish-speaking patients were associated with increased adherence to the cardiovascular medications within their diabetes treatment regimen.

Another argument for increasing diversity in PA education is that diversity within a class of PA students improves the cultural competency of PA students as they prepare to enter the profession. Saha, Guiton, Wimmers, Wilkerson (2008), reviewed the responses of over 20,000 medical school graduates on the Graduation Questionnaire (GQ), which was administered by the AAMC between 2003 and 2004. They found that white students who graduated from medical schools in the two highest quintiles for student body diversity had 27-43% greater odds of rating their cultural competence as high, as compared with students in the lowest diversity quintiles. These same students also had 42-51% higher odds of having strong attitudes endorsing equitable access to care. This study supports previous research showing that all students benefit in regards to cultural awareness and competence when part of a more diverse student body.

The current body of research regarding diversity in healthcare confirms that racial and ethnic minority healthcare providers are more likely to serve underserved medical communities, race-concordance and language-concordance matters for patient satisfaction and outcomes, and diversity in a medical education program improves the cultural competency of all students in the class. The first step to increasing diversity within the PA profession is accepting more URM students to PA school. The following section examines the current state of PA school admission processes.

Physician Assistant Program Admission Processes

Becoming a PA first requires acceptance to an accredited PA program. From the 2012-2013 to the 2015-2016 matriculating classes, only 33-34% of all applicants to PA school ultimately matriculated into an accredited program (CASPA, 2017a). Given the limited seats available as compared to the number of applicants, the admissions process for PA school has become very competitive. The majority of PA schools use CASPA for their initial applications. In the 2017 cycle, 216 of the 226 programs, or 96%, utilized the CASPA system (CAPSA, 2017b). The cost of the CASPA application varies based upon the number of schools to which students apply. Application to the first two selected schools is included in the base fee of $175, and each additional school costs $50 (CASPA, 2017b). The average applicant applies to about 7 schools per year, leading to an average base cost of about $475 to CASPA.

In addition to the CAPSA application, many schools require a supplemental application, which may include essay questions, additional personal information, and/or additional fees that are sent directly to the school. This secondary application allows individual schools to ask questions that pertain directly to the school's mission and

admissions criteria. However, the added expense can create additional financial strain for potential applicants. Once an application is vetted, additional costs may arise related to preparation and travel to interviews as well as deposits to hold a seat in a program when the applicant is accepted. All of these fees together create a significant financial commitment for applicants, given that only about one out of three applicants will get a spot in a program (CASPA, 2017a). This required investment creates financial barriers that may impact an individual's choice process when considering application to PA school.

Admission criteria are currently determined by each individual PA program, with each program attempting to identify candidates who will be successful both academically and professionally. According to the AAPA (2018b), most PA programs require the same prerequisite courses as medical schools, which generally require students to take courses in basic sciences, behavioral sciences, and clinical medicine. The average PA program also requires that applicants have around three years of healthcare experience at the time of application. As candidates are evaluated, each school decides how to weight both cognitive and noncognitive factors. Cognitive factors are evaluated by using the applicant's grade point average (GPA) and standardized test scores. The most frequently used standardized test in PA school admissions is the Graduate Record Exam (GRE), and for medical school the standard admissions exam is the Medical College Admission Test (MCAT). Noncognitive attributes include a broad range of factors, including interpersonal skills, emotional intelligence, and personality traits (Jones, Simpkins, & Hocking, 2014).

The use of cognitive and noncognitive factors in the admission process for PA school is well documented. Jones, Simpkins, and Hocking (2014) reviewed publically available data regarding admissions criteria for all PA and physical therapy (PT) programs in the United States and found that the admissions processes among PA schools have significant variation, particularly as they relate to the use of noncognitive factors. The authors concluded that most programs appear to value the use of noncognitive factors when deciding who should become a PA, but no agreement exists regarding how noncognitive factors should be used. In 2013, McDaniel, Thrasher, and Hiatt surveyed all PA programs in the United States to determine the most commonly used noncognitive criteria. They found that the five most commonly cited noncognitive criteria used in PA admissions processes were career motivation, knowledge of the profession, maturity, professionalism, and interactions with faculty, staff, and interviewer(s). However, they did not look at how schools defined or measured these attributes, making it difficult to understand how noncognitive assessments ultimately impacted participants' admissions processes.

Nilson (2016) collected data from 146 PA students at a single university to examine whether personality traits as measured by the Big Five Inventory (John, Naumann, & Soto, 2008) were correlated with academic success for PA students. The study identified correlations between personality traits including conscientiousness, agreeableness, and extraversion, and markers of academic success such as preclinical GPA, clinical GPA, and passing the PANCE exam. Although Nilson's study did not demonstrate causation, the results did suggest that measurement of noncognitive factors may be a useful tool to predict academic success in PA students.

Unlike noncognitive factors, the use of cognitive factors in PA school admissions processes is virtually universal and supported in the literature. Higgens, et al. (2010) conducted a retrospective analysis of admissions factors in six PA programs, including both cognitive and noncognitive factors, to see if any were predictive of student performance on the PANCE. All graduates of PA programs must pass the PANCE to qualify for their national certification, which is a requirement to practice medicine as a PA, making this test a crucial step in the process of becoming a PA (AAPA, 2018c). The only admissions factors that were found to be predictive of PANCE performance were cognitive factors: GPA, GRE verbal score, and GRE quantitative score (Higgens, et al., 2010). Despite evidence that cognitive scores are useful in predicting success, one study found that GRE scores, a common cognitive factor, are frequently used incorrectly (Hocking & Piepenbrock, 2010). A 2010 study found that approximately 47% of PA programs in the United States were using the GRE for admissions (Hocking & Piepenbrock). However, only 40% of those programs were applying scores in accordance with guidelines established by Educational Testing Service (ETS), the company that publishes the GRE. Hocking and Piepenbrock found that 60% of programs were using GRE scores incorrectly by either requiring a minimum score or allowing other admissions exams to substitute for the GRE.

With significant variation among schools in the use of cognitive and noncognitive factors, applicants can have difficulty feeling confident in their own ability to meet admissions criteria, or accurately assessing their likelihood of being accepted to PA school. This lack of uniformity and clarity around the process complicates the process for all potential applicants. In addition to these difficulties experienced by all applicants to

PA school, URM applicants have been shown to experience additional barriers, making application even more challenging.

Barriers for Underrepresented Minority Applicants

While application to PA school is difficult for anyone, additional barriers may exist for URM applicants. Minimal research has been done to examine barriers specific to PA school applicants, but a body of literature has examined this topic for medical students. The following section will describe recent research on barriers for application to medical school, along with the few studies that have shown that similar barriers exist for PA school applicants. Understanding of existing barriers is necessary before discussing strategies to minimize barriers and increase the diversity of the PA school pipeline.

Studies have shown that both applicants and medical school faculty believe that barriers exist for URM applicants, but the groups differ in what they view as the most challenging hurdles (Agrawal, Vlaicu, & Carrasquillo, 2005; Alexander, Chen, & Grumbach, 2009; DiBaise, Salisbury, Hertelendy, & Muma, 2015; Freeman, Landry, Trevina, Grand, & Shea, 2016; Hadinger, 2017). In general, URM applicants and students report social support and financial resources as the primary barriers to admission to a health professions program. Freeman, Landry, Trevina, Grand, and Shea (2016) spoke with 82 URM college students to identify perceived barriers to pursuing a career in medicine. The students identified several barriers, including inadequate institutional resources, strained personal (financial) resources, inadequate guidance and mentoring, and societal barriers. Similarly, Hadinger (2017) asked 33 URM medical students who had enrolled in medical school to discuss their experiences with admissions barriers. The students reported lack of guidance and social support, financial barriers, and academic

factors as problems during their process of applying to and enrolling in medical school. In both studies, examples of social support barriers included a lack of access to information or mentoring, lack of feedback through the process, and lack of support from academic advisors.

Although URM college and medical students report the largest barriers as lack of support and financial constraints, faculty tend to describe academic factors as the largest barriers to URM medical student enrollment. Agrawal, Vlaicu, and Carrasquillo (2005) surveyed all allopathic and osteopathic medical schools in 2002 and found that faculty at the medical schools reported the largest perceived barrier to enrollment of URM students to be MCAT scores, followed by a lack of minority faculty and lack of minority role models. DiBaise, Salisbury, Hertelendy, and Muma (2015) repeated this study with faculty at PA schools for comparison and found that faculty perceived the largest barrier for URM admission to PA school to be GPA. This perception was supported by the work of Alexander, Chen, and Grumbach (2009), who reviewed the records of 15,000 college students enrolled in medical school prerequisite courses, referred to as gateway courses in this study. They found that when comparing across ethnic groups, URM students received significantly lower grades in their gateway courses to apply to medical school than the white students in their classes. Because GPA is a significant factor in the admissions process for medical schools, these lower grades in prerequisite courses created a barrier for URM students who went on to apply to medical school.

Strategies to Increase Diversity in PA Education

The actual impact of cognitive factors on an applicant's admission to medical or PA school is partially determined by how an individual school chooses to weigh

cognitive and noncognitive factors when considering applicants. As previously discussed, individual schools determine how to evaluate or score applicants to their own program, often assigning points to various admissions criteria, creating scores for individual applicants to identify the strongest candidates with the highest scores. Ballejos, Rhyne, and Parkes (2015) conducted a small study to model the potential effect of changing the relative weight of cognitive and noncognitive factors when scoring individual applications to a medical school in New Mexico. Between 2007 and 2009, the medical school increased the relative weight of noncognitive factors (background and diversity, interest and suitability for a career in medicine, problem-solving and communication skills, and letters of recommendation) compared to cognitive factors (GPA and MCAT scores) in admissions decisions.

They found that this change significantly increased the proportion of URM students who were accepted to medical school. By changing from a weighting of 50% cognitive points and 50% noncognitive points, to 35% and 65% respectively, the proportion of URM students accepted to the program increased from 24% of the class to 30%. All of the students admitted still met basic criteria, and the average GPA and MCAT scores of the admitted class were still in line with national averages. The findings from Ballejos, Rhyne, and Parkes (2015) demonstrated that admission rates of URM students could be increased without compromising the standards of the program.

McDaniel, Thrasher, and Hiatt (2013) discussed the use of noncognitive admissions factors in PA admissions, not to address diversity issues, but as a way to screen for skills that would be useful as a student and as a practicing PA. They performed a literature search to identify noncognitive factors that were reported as part of the

admissions processes for various health professions schools. Using this, they developed a survey incorporating the most frequently cited factors and sent it to all program directors of United States PA programs, asking them to rank the factors that were most valued in their program's admissions process. The 94 programs that responded all reported the use of noncognitive factors in their admission processes, the most influential being faculty/staff/interviewer interactions, career motivation, knowledge of profession, maturity, and professionalism. Although these study did not address the use of noncognitive factors to increase diversity, it confirmed that the use of noncognitive factors to influence PA admissions is common practice. Nilson (2016) demonstrated that personality traits measured using the Big Five Inventory were correlated with markers of academic success, providing a model for measuring noncognitive traits in applicants.

Another case study was published in 2012, detailing how the PA program at Chatham University implemented a holistic admission process, specifically to increase diversity in the classroom (Felix, et al.). This process included eliminating the interview from the process, and the introduction of a holistic credit system, where applicants received points for attributes that would suggest that they have pertinent life experience. These attributes included academic background and achievement, but also personal experiences with hardships and contact with other cultures, personal characteristics such as ethnicity, race, and socioeconomic status, and personal attributes including leadership, motivation, and maturity. Following implementation, the school found that their proportion of URM students did increase while maintaining high academic standards, as evidenced by an average overall and science GPA similar to CASPA averages. Although the legality of awarding admissions points based upon race and ethnicity has been

challenged in the past, a recent decision in Fisher v. University of Texas at Austin et al., 579 U.S. ___ (2016) upheld that admission officials may continue to consider race as one factor in the admission process to ensure a diverse student body.

While admission protocols are important in increasing the proportion of URM applicants who are accepted, these approaches to increasing diversity do not address the problem of the low numbers of URM college students or graduates who choose to apply to PA school in the first place. Targeted recruitment efforts have been utilized by individual schools as well as PA national organizations. Some examples of recruitment processes designed to increase diversity include targeted site visits, preadmission counseling, education regarding student loans, and presentations targeted to minority students (Agrawal, Vlaicu, & Carrasquillo, 2005; DiBaise, Salisbury, Hertelendy, & Muma, 2015).

Unfortunately, evidence suggests that effective recruitment strategies are under-utilized and poorly understood by both medical and PA programs. In their study regarding barriers and strategies for recruitment, Agrawal, Vlaicu, and Carrasquillo (2005) found that the only two strategies that medical school rated as "very effective" were having a URM student recruiter and using enrichment programs prior to application and matriculation for URM students. Enrichment programs can take many forms, but generally are additional training provided to potential students in an effort to better prepare them with skills and resources needed to successfully apply to and complete medical programs. Utilizing a summer enrichment program was the only strategy in the study that positively correlated with a school having a higher proportion of enrolled URM medical students. This finding aligns with previous research that has shown that

post-baccalaureate/pre-medicine enrichment programs improve recruitment and retention of URM medical students (Grumbach, & Chen, 2006; Strayhorn & Demby, 1999; Giordani, et al., 2001). However, only 66% of programs in Agrawal and colleague's (2005) study reported having any type of enrichment program, suggesting that recruitment strategies frequently do not align with best practices. When asked to rate their school's effectiveness in recruitment of URM medical students on a scale from one to ten, the average score that schools gave to themselves was 8/10. Unfortunately, these self-assessed scores correlated weakly with the actual percentage of URM students that enrolled in the school, suggesting a lack of self-awareness among schools about their effectiveness in recruiting URM students.

In their replication of this study using PA schools, DiBaise, Salisbury, Hertelendy, and Muma (2015) found that only four strategies were used by close to 50% or more of programs, which suggested that PA schools are even farther behind medical schools in their recruitment of URM students. As with medical schools, respondents from PA schools rated enrichment courses as the most effective strategy. However, only 9% of programs reported using enrichment courses. Overall, the PA programs were found to utilize recruitment strategies less frequently than medical schools, while reporting that financial barriers are a larger problem (DiBaise, Salisbury, Hertelendy, and Muma, 2015). One positive finding was that self-reported success in recruitment did correlate with increased URM matriculation into PA schools, suggesting that programs have accurate awareness of the effectiveness of their strategies. However, the low utilization of recruitment strategies seems to reflect a lack of action among PA programs in the United States.

Despite evidence that recruitment strategies are not routinely utilized by individual PA programs, PAEA has created programs at the national level to improve the diversity of the pipeline of prospective PA (PAEA, 2018f; Summer Health Professions Education Program, 2017). The PAEA has developed a program called Project Access (PAEA, 2018f), where practicing PAs and PA students speak with high school students from URM groups, encouraging them to consider the PA profession as a career. Additionally, PAEA has worked to promote participation in the Summer Health Professions Education program, a free, six-week academic enrichment program designed to improve access to information and resources for college students interested in a health profession career. Specifically, the goal of this program is to "strengthen the academic proficiency and career development of students underrepresented in the health professions and prepare them for a successful application and matriculation to health professions schools" (Summer Health Professions Education Program, 2017).

The United States government also sponsors programs called Health Career Opportunity Programs (HCOP) through grants from HRSA (HRSA, 2018). The HCOP grants from HRSA are available to schools training a variety of different health care profession students, including PA potential students. The purpose of the grant program is to fund academies that support students who come from disadvantaged backgrounds. Ultimately, the program is intended to increase the matriculation rate of these individuals into graduate medical programs. Although the grant does not specifically mention URM racial and ethnic minority groups, this grant has the potential to impact potential URM PA students in their choice processes.

Although PAEA has implemented strategies for recruitment of URM applicants at the national level, no published data exists regarding the success of these interventions at increasing the number of successful URM applicants to PA programs. However, both Project Access and HCOPs are included on CASPA, and Project Access in included on the MSS as potential influences that participants were asked to rate. This study analyzed the responses of URM and non-URM applicants and matriculants to Project Access, HCOPs, and many other influences to better understand the effectiveness of various recruitment techniques and information sources in improving the diversity of PA education. This research is important given that the literature suggests that recruitment techniques aimed at potential URM applicants to PA school have low utilization, poor alignment with evidence, and significant variation in implementation among schools.

Influences and Choice Process

Thus far, this chapter has reviewed statistics regarding the unequal representation of certain racial and ethnic groups in the PA profession and the ways that increasing diversity can improve the quality of healthcare for patients. The current status of PA school admissions including barriers for URM applicants and some of the strategies being implemented by individual programs and the PAEA to increase the diversity within PA education were also discussed. The literature cited in this chapter supports the concern that a lack of diversity among medical providers is a problem in healthcare, and that a dearth of data can be found regarding the effectiveness of current initiatives to improve diversity or new strategies that may be effective in recruiting URM applicants to PA school.

The goal of this study was to improve understanding of the choice process of potential URM applicants considering the PA profession, including the timing of their decision to become a PA and their perception of influences that impacted that decision. The exact CASPA and MSS survey items that were used to address the research question in this study were selected due to their alignment with previous research on the choice process of undergraduate, graduate, and medical students. Particularly, the factors for this study were selected to test the conceptual framework proposed by Hadinger (2017), which was based on the work of St. John (St. John and Paulsen, 2002; St. John and Asker, 2001) and Perna (2006). Hadinger's framework was developed following her qualitative research with URM medical students, where they discussed positive influences, as well as barriers to their medical school admission. Hadinger's Conceptual Model of Minorities in Medical School Admissions (Figure 1) contains several possible influences on the admissions process to medical school, under the categories of motivators and barriers/supports. The possible influences listed on CASPA and the MSS all fall into these boxes of Hadinger's model, as sources that can impact the choice process of potential applicants. This study analyzed URM and non-URM applicant and matriculants' perceptions of these influences to determine if Hadinger's model was applicable to PA school admissions.

Summary

Chapter two synthesized current literature assessing trends and needs in medicine related to diversity, as well as outlining the PA education admissions process. Within the PA school admissions process, several barriers exist to the matriculation of URM PA students. PAEA and other organizations are working to remove barriers and provide

assistance to potential URM PA students. Hadinger (2017) and Perna (2006) examined many of these barriers, as well as positive influences, to create the theoretical framework for this study. Chapter three will detail the methodology employed in this study to test the findings of Hadinger and Perna, and to improve understanding of the current choice process of URM applicants and matriculants to PA school.

Chapter III: Methodology

Introduction

The purpose of this study was to investigate the relationship between PA school applicant and matriculant self-reported URM status and their choice process when considering the PA profession. To assess these relationships, CASPA applicant data and MSS data were collected and analyzed. This chapter will cover the research method and design including theoretical framework for the methodology, explanation of variables, instrumentation and measures, data collection and analysis, limitations of the methodology, and ethical considerations related to this study.

Research Questions

The following research questions were addressed in this study:

1. What difference, if any, exists between how URM and non-URM PA school applicants first learned about the PA profession?
2. What difference, if any, exists between URM and non-URM PA school applicants, in what they report as the most influential factor in bringing them to the PA profession/PA education?
3. What difference, if any, exists between when URM and non-URM PA school matriculants ultimately decide to pursue a career as a PA during their educational process or careers?
4. What differences, if any, exist between URM and non-URM PA school matriculants, in how they report various factors as absent, a negative influence, a positive influence, or neutral in their choice process when deciding to become a PA?

Hypotheses

Based upon the theory of cultural capital and habitus as defined by Bourdieu (Bourdieu & Passeron, 1977), as well as recent qualitative research by Perna (2006) and Hadinger (2017), the researcher hypothesized that race and ethnicity impacted the choice process of URM students, creating differences in the process as compared to non-URM students. The specific hypotheses for each research question were:

$H1_0$: No differences exist between how URM and non-URM PA school applicants first learn about the PA profession

$H1_1$: Significant differences exist between how URM and non-URM PA school applicants first learn about the PA profession

$H2_0$: No differences exist between URM and non-URM PA school applicants, in what they report as the most influential factor in bringing them to the PA profession/PA education

$H2_1$: Significant differences exist between URM and non-URM PA school applicants, in what they report as the most influential factor in bringing them to the PA profession/PA education

$H3_0$: No differences exist between when URM and non-URM PA school matriculants ultimately decide to become a PA

$H3_1$: Significant differences exist between when URM and non-URM PA school matriculants ultimately decide to become a PA

$H4_0$: No differences exist between URM and non-URM PA school

matriculants, in how they report various factors as absent, a negative influence, a positive influence, or neutral in their choice process when deciding to become a PA

$H4_1$: Significant differences exist between URM and non-URM PA school matriculants, in how they report various factors as absent, a negative influence, a positive influence, or neutral in their choice process when deciding to become a PA

Research Method and Design

This study was a quantitative, retrospective analysis of existing data sets that had been collected by PAEA through CASPA applicant data and the MSS. In both survey instruments, participants were asked to provide demographic information including gender, race, and ethnicity. Participants were also asked several questions regarding their decision to pursue the PA profession through application to one or more PA programs. Appendix A contains the exact wording of the CASPA and MSS items that were analyzed for this study.

Theoretical Framework for Methodology

The population for this study was selected based on the anti-deficit achievement theory, proposed by Harper (2010). Harper's theory was developed following research with students of color in STEM undergraduate courses. The anti-deficit achievement theory emphasized the importance of examining how students of color persisted and succeeded in the STEM pipeline, as opposed to focusing on those who did not. Harper argued that the majority of research on students of color is focused on factors that cause them to do poorly. While research of unsuccessful students can be helpful, examining

factors that led to success is also necessary to create a roadmap for achievement. Harper interviewed 219 black male undergraduate students, all of whom had cumulative GPA averages over 3.0, leadership experience, and positive relationships with administrators who selected them. Harper identified programs, policies, and resources that had demonstrated effectiveness in helping black men achieve "desired educational outcomes" (p. 66). Using Harper's theory as a model, this study examined applicants and matriculants who had successfully navigated the process of applying to PA school. The current study design was designed to create a roadmap to success for potential PA applicants, providing insight into strategies and resources utilized by successful URM applicants and matriculants to PA school.

The research questions and hypotheses for this study were derived from the work of Perna (2006) and Hadinger (2017). Hadinger's Conceptual Model of Minorities in Medical Education (Figure 1) illustrates the choice process of URM applicants to medical school, highlighting the impact that various influences have on the choice process at multiple stages in the process. In Hadinger's discussion of her model , she suggested that quantitative studies of disaggregated data are needed to explore how applicants use various types of data in their choice processes. This study was designed as an extension of Hadinger's work, to provide insight through analysis of quantitative data collected by national PA organizations.

In addition to looking at individual influences on applicants and matriculants to PA school, this study examined the larger contexts of those influences. Perna (2006) proposed four primary contexts which can influence the choice process of students: the student's school and community, the habitus of the student, the higher education system,

and the broader social, economic, and policy environment. Using her contexts as a guide, this study grouped the individual influences included on CASPA and the MSS into five specific contexts or categories: personal relationships, professional experiences, academic experiences, media and information fairs, and resources from the PA professional organizations. By grouping potential influences into broader contexts, trends were identified related to broad spheres of influence, providing context for discussing systems that impact URM applicants and matriculants. The categorization of each individual variable is found in the next section.

Variables

The independent variables in this study were self-identification as a member of a URM racial or ethnic group, or a non-URM racial or ethnic group. On the CASPA applicant data, the options provided to participants that fit under the AAMC's definition of URM in medicine (AAMC, 2003) were black, American Indian, and Hispanic. On the MSS, the categories had slightly different titles: black or African American, American Indian or Alaskan Native, and Hispanic, Latino, or Spanish origin. Participants who selected any of these categories, either as a single option or in combination with another option, were included in the URM group for analysis in this study.

The dependent variables for this study were: how applicants first heard about the PA profession, the single factor that applicants listed as the most influential factor in bringing them to the PA profession/PA education, the point during their educational career that matriculants ultimately decided to pursue the PA profession, and the rating the impact of each possible source of influence on their own choice process when

considering the PA profession. The specific influences used for the final research question are listed below:

- AAPA website/literature
- PAEA website/literature
- PA program literature
- College/campus admissions department
- Public media (e.g., television, newspaper, radio)
- Social media (e.g., YouTube, Facebook)
- Project Access
- Previous healthcare experience
- Previous military experience
- PA program faculty or staff
- Friend
- Family member
- Career counselor/teacher (high school or college)
- Physician who treated me/my family
- Other physician acquaintance
- PA who treated me/my family
- Other PA acquaintance
- Other health professional
- Other, please specify

The last option on the list was "Other, please specify." This option was linked to an open text field on the survey which matriculants could choose to complete. The

option of "Other, please specify" was not included in this study for analysis due to the low number of participants who selected this option, as well as the fact that the text entered by participants frequently overlapped with other selections they had made (i.e. several participants wrote Physical Therapist in the open text field, while also selecting "Other Health Professional" as an influence).

When the MSS participants were asked to complete the MSS item regarding the influences listed above, they were asked to rate each influence by selecting from the following options: did not use/have, made me not want to become a PA, no influence on my decision to become a PA, made me want to become a PA. For the purposes of analyzing responses related to research question four, these options were recoded as absent, a negative influence, neutral, or a positive influence respectively.

Categorization of Variables. Using Perna's (2006) proposed contexts that influence URM choice process when considering graduate school, the dependent variables for research questions one, two, and four were categorized into five contexts for analysis: personal relationships, professional experiences, academic experiences, media and information fairs, and resources from PA professional organizations. The categorization of the variables from the CASPA question used to answer research questions one and two are found in Figure 2, and the categorization of the variables from the MSS item used to answer research question four are found in Figure 3.

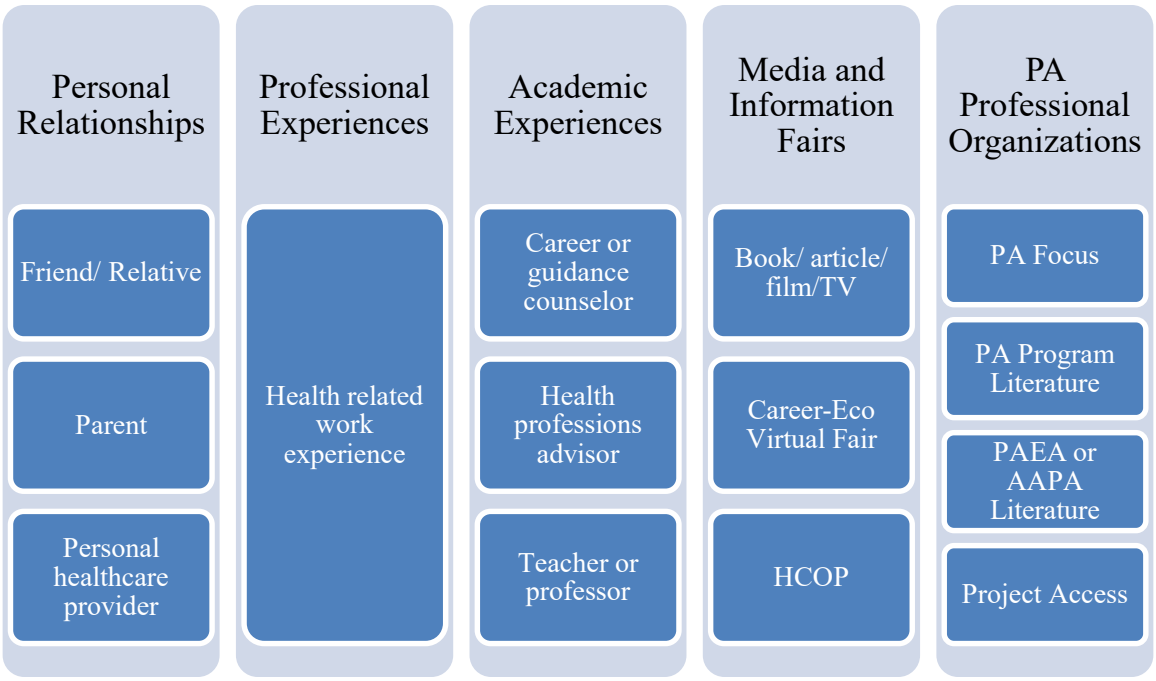

Figure 2. Categorization of Variables for Research Questions Two and Three

Instrumentation and Measures

For this study, data from CASPA and the MSS was utilized. Both sets of data are collected yearly and are specifically designed to collect information about the pipeline of students entering the PA profession. The data collected through these instruments allows for quantitative analysis of the entire pool of applicants and matriculants respectively. Although the information gained in these quantitative tools is less specific than in a qualitative study, the ability to survey all of the applicants and matriculants to PA school creates a unique opportunity to analyze the entire population of students entering the PA education pipeline. Both instruments include items that directly assess the applicants' and matriculants' choice processes when considering the PA profession as a career. Because both instruments collect demographic information, including race and ethnicity, the data can be analyzed to address the research questions in this study. The two instruments are

administered separately, and no individual identifier exists to allow researchers to link participants in the CASPA applicant data to those in the MSS.

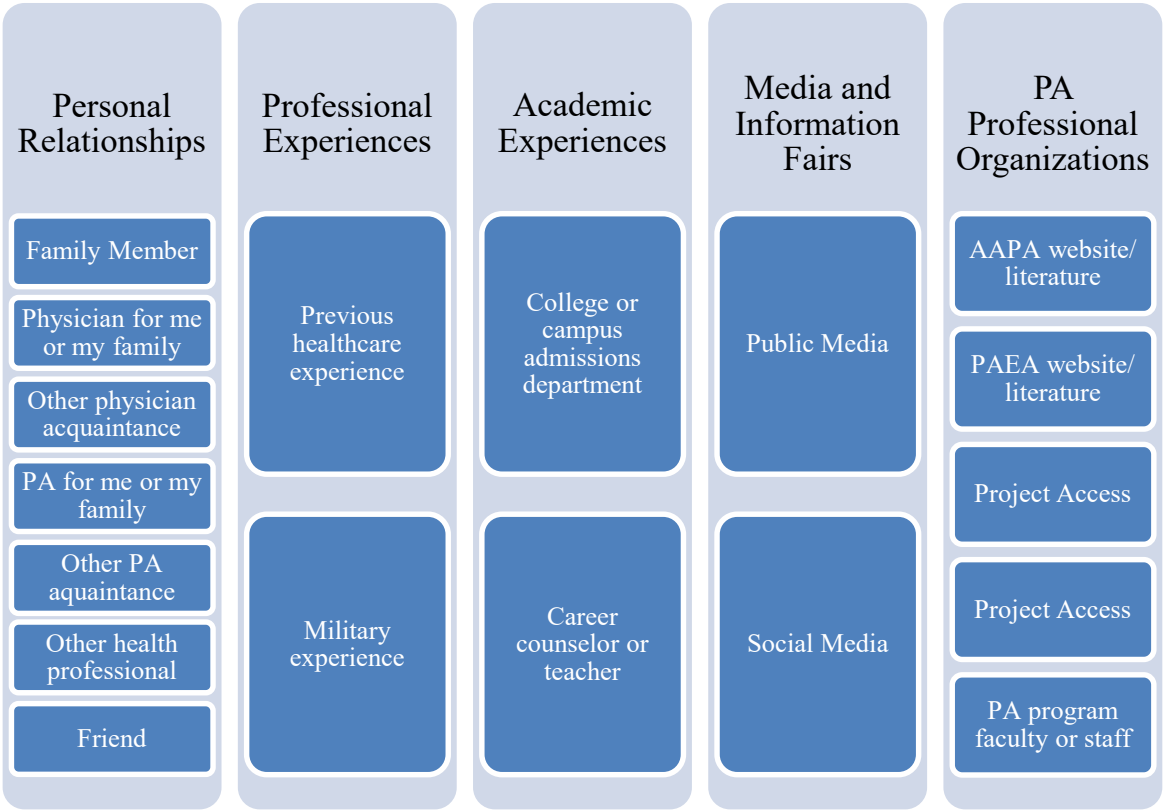

Figure 3. Categorization of Variables for Research Question Four

The first set of data came from the information that applicants supplied to CASPA (CASPA, 2018). CASPA is a website where applicants to PA school can complete a single application form and submit it to any participating PA program. The CASPA application is part of a larger system of centralized applications, provided by Liaison Centralized Application Service (CAS) (Liaison, 2017). CAS creates centralized applications for many types of programs in higher education including PT, athletic training, and nursing. Because the CAS system provides application templates to many different professional organizations, individual organizations like PAEA cannot edit the

items on the applicant data questionnaire. CAS includes questions asking applicants how they first learned about the PA profession and what the most influential factor was in their decision to pursue the PA profession, which were used to address research questions one and two in this study.

In 2017, 216 of the 226 PA programs in the United States utilized CASPA for their application process (CASPA, 2017b). All applicants were asked to complete the demographic and personal information utilized for this study. The average CASPA applicant in 2017 applied to approximately seven PA programs, but the CASPA system enables researchers to obtain individual level data without duplication, making it the best source of applicant data in PA education.

The second set of survey data utilized for this study was from the MSS administered by the PAEA (PAEA, 2017a). The MSS is an electronic survey of all PA students who matriculated into an accredited PAEA member program in a given calendar year and is conducted annually. To administer the 2017 MSS, PAEA emailed the program directors of accredited, PAEA member programs at the beginning of the month in which they were scheduled to matriculate students in 2017. Program directors were asked to forward the survey link to all students in their matriculating class. Program directors were also asked to provide PAEA with the number of students that matriculated into their program in 2017 to assist with calculating the response rate for the MSS. Participation in the MSS was optional, however PAEA did provide an incentive of entry into a drawing for a $250 gift card and for a complimentary registration to the 2018 PAEA Education Forum for any programs with a response rate of 80% or greater.

All of the 2016-2017 CASPA applicant data and 2017 MSS data was collected and stored securely by PAEA following survey administration. See Appendix B for the CASPA 2016-2017 Manual, pages 18 and 19, which outline CASPA policies regarding applicant data collection, storage, and usage. The complete manual can also be found on the CASPA website (CASPA, 2017c). Appendix C contains the consent form and description of data storage processes utilized for the MSS by PAEA.

Populations

The first two research questions for this study were addressed through items completed by participants in the 2016-2017 CASPA application cycle. The 2016-2017 cycle opened to PA school applicants on April 27, 2016 and closed on March 1, 2017. In the 2016-2017 cycle, 26,768 applications were submitted and all CASPA applicants had the option to respond to questions regarding their race and ethnicity, as well as the specific items used in this study that asked about their choice process.

For the 2017 MSS, 4,050 matriculants participated out of the estimated 9,626 students who matriculated that year, for an estimated response rate of 42.1% of all 2017 matriculants (PAEA, 2018c). Responses were received from matriculants of 163 different PA programs, resulting in 75.8% of the 215 eligible programs being represented in the survey results in 2017.

Data Collection

For this study, four items from the PAEA tools were specifically explored to answer the four research questions. This section will outline the questions and possible responses used for analyzing each item. The exact items utilized from each of the tools are listed in Appendix A, and the complete MSS with all survey items is in Appendix D.

Release of the items included on CASPA is restricted by CAS, therefore a complete listing could not be included with this paper.

Research Question #1: What difference, if any, exists between how URM and non-URM PA school applicants first learned about the PA profession? This question was addressed by analyzing an item in the CASPA application which asked all applicants, "How did you first hear about the PA profession?" The options for this question were: Parent, Another friend/relative, Personal healthcare provider for me or my family, Teacher or professor, Health professions advisor, Health related work experience, Book/article/film/television, PAEA or AAPA literature, PA program literature or faculty, Career or Guidance counselor, Career-Eco Virtual Fair, PA Focus, Project Access, or HCOP/Health Career Opportunity Program. Participants were only allowed to select one of the options for this item.

Research Question #2: What difference, if any, exists between URM and non-URM PA school applicants, in what they report as the most influential factor in bringing them to the PA profession/PA education? The second research question was addressed through the item on the CASPA application which asked applicants, "What was the most influential factor in bringing you to the PA profession/PA Education?" For this item, the participants were asked to identify the single most important influence in their decision. The options for this question are the same as the options for the item used for research question one.

Research Question #3: What difference, if any, exists between when in their education process or careers URM and non-URM PA school matriculants definitely decided to become a PA? The third research question was addressed on the MSS in an

item asking, “When did you definitely decide to become a physician assistant?” For this item, the possible responses on the 2017 MSS were: Before high school, during high school/before college, during the first two years of college, after receiving an associate's degree, during junior year in college, during senior year in college, after receiving a bachelor's degree, or after receiving an advanced degree. Participants were only allowed to select one response to best represent when they decided to pursue the PA profession.

Research Question #4: What differences, if any, exist between URM and non-URM PA school matriculants, in how they report various factors as absent, a negative influence, a positive influence, or neutral in their choice process when deciding to become a PA? The final research question was addressed on the MSS through a multi-part item which asked matriculants to rate a series of possible influences on their choice process in deciding to become a PA. The item created a more detailed set of responses than the item used from the CAPSA data for research question two, where participants only listed the single most important factor. The item on the MSS allowed participants to rate each possible factor as either absent, positive, negative, or neutral in their choice process. The specific language from this item is listed in Appendix A.

Data Analysis Procedure

All data related to the research questions for this study was analyzed using SPSS version 25. Chi-square tests of independence were performed to identify dependence between URM status and various aspects of the choice process when considering the PA profession. The chi-square test of independence is a statistical tool used to identify dependence between categorical variables, although it does not determine causation. The chi-square test of independence allows for testing of non-parametric data and accounts

for unequal group sizes, which was appropriate given the difference in size of the URM and non-URM groups for this study. Multiple assumptions must be met for a chi-square test of independence to be valid (McHugh, 2013). The first is that the study groups must be independent of one another, which is true of the URM and non-URM groups in this study. Another assumption that must be met for chi-square analysis is that the value of the expected count must be five or more in 80% of the cells, and no single cell can have an expected count of less than three. This assumption was not met for some of the data points in this study, which will be addressed in the results section.

The CASPA and MSS data sets for this study were provided by PAEA following a data request completed by the researcher. Each data set contained de-identified data for every participant including their self-identified race and ethnicity, as well as their responses to questions about their choice process when considering the PA profession. The first step in organizing the data was to categorize participants as either URM or non-URM applicants or matriculants. When completing either survey, participants were allowed to select multiple race and ethnicity categories to best represent their racial and ethnic background. For this study, any participant who selected a single option or multiple options that included Black or African American, American Indian or Alaskan Native, or Hispanic, Latino, or Spanish in origin was included in the URM group. Any participant who selected only racial or ethnic identifications other than these URM groups, either as a single selection or in combination with other selections, was included in the non-URM group. Participants who did not respond to the race or ethnicity questions were excluded from analysis for this study.

In the next step of data organization, responses to the CASPA and MSS items related to the four research questions were recoded to indicate whether an individual selected a specific response or not. For example, in research question three, participants were asked when they definitely decided to become a PA, and they were provided with eight possible responses including before high school, during high school/before college, during the first two years of college, after receiving an associate's degree, during junior year in college, during senior year in college, after receiving a bachelor's degree, or after receiving an advanced degree. The data for this item was recoded into eight separate columns, indicating whether an individual participant selected a single option or not. Following this coding, eight separate chi-square tests were run to determine if a dependent relationship existed between URM status and the likelihood that an individual would select a specific option for this item. A sample chi-square is included below in Table 1. This procedure was completed for every possible response to each item being analyzed for this study to determine if a depended relationship existed between URM status and the likelihood than an individual would select each option on the surveys.

When working with large study populations, the results of a chi-square analysis are more likely to appear significant, creating error in interpretation (McHugh, 2013). To minimize this error, an alpha level of 0.01 was used to determine significance for each relationship analyzed in this study.

Table 1

Sample chi-square analysis of an option for research question number three

			Selected Before High School		
			Yes	No	Total
URM Status	Non-URM	Count	58	3462	3520
		Expected Count	58.0	3462.0	3520.0
		% within non-URM	1.6%	98.4%	100.0%
	URM	Count	8	479	487
		Expected Count	8.0	479.0	487.0
		% within URM	1.6%	98.4%	100.0%
Total		Count	66	3941	4007
		Expected Count	66.0	3941.0	4007.0
		% within URMFinal	1.6%	98.4%	100.0%

Limitations and Delimitations of Methodology

The methodology for this study resulted in several limitations and delimitations to this study. The first limitation was due to the participation rate for the MSS. Although the MSS was offered to the entire population of matriculating PA students, PAEA estimated that 42.1% of students that matriculated into a PA program in 2017 completed the 2017 MSS (PAEA, 2018c). Self-selection bias may have occurred, based on the individuals who chose to complete the MSS.

Another limitation was due to the terms used on the CASPA application and MSS, which may or may not have been understood by participants. Although many of the options would be well-understood, such as family, friend, or PA program literature, some response options on this item may not have been familiar to many participants, such as HCOP, Project Access, or PA Focus. A lack of understanding of these terms may have led participants to respond inaccurately.

A final limitation related to the data sets used for this study was that no consistent, unique identifier exists that would allow for linkage of respondents to the CASPA applicants data to those in the MSS. The two surveys are administered separately through separate organizations, and although some overlap likely occurred between individuals that applied to CASPA in 2016-2017 and those that matriculated to a PA school in 2017, no system existed to track the movement of individuals using these surveys. This study analyzed the applicant and matriculant cohorts separately, and although the results can be generalized to a degree, direct connections between the two groups could not be made.

The first delimitation to this study was related to the population for the surveys which only included individuals who had decided to pursue the PA profession. This study does not capture the factors that influenced individuals who considered the PA profession, but decided against pursuing the profession. Information regarding the choice process of individuals who were influenced away from the PA profession would provide very useful knowledge, and is a potential topic for a future study. A second delimitation that resulted from using large data sets provided by PAEA was that the researcher was not able to pilot or adjust the survey items. The items used for this study were selected because they closely related to the research questions for the study. A customized survey for this study would have allowed for alignment between the applicant and matriculant populations but the sample size would have been smaller than the population provided through CASPA applicant data the MSS.

The final delimitation was that the analysis of data only identified dependent relationships between URM status and choice process. The methodology and survey

instruments used did not allow for determination of causality or development of qualitative explanation for the relationships that were seen.

Ethical Considerations

During the data collection for CASPA and the MSS, the ethical principles of the Belmont Report were strictly followed (HHS, 1979). These principles include respect for persons, justice, and beneficence, with methods created to limit harm to the individual. All participants who provided data to the PAEA completed an informed consent document. The terms of use and consent form for the CASPA can be found in Appendix B, and the correlating information for the MSS is located in Appendix C. These documents clearly outline the potential risk of participation, the voluntary nature of the instruments, and the potential that data could be used for future research. All participants completed this electronic consent before completing their survey.

The PAEA owns and manages data from a variety of sources, including CASPA and the MSS. Data can be requested by researchers, however PAEA maintains strict standards to minimize risks related to data utilization. As stated on the PAEA Data Request and Sharing Policies website, PAEA enforces four "Guiding Principles" related to the dissemination of data and reports, designed to protect individuals who choose to participate in PAEA research:

- PAEA and the profession benefit from wide dissemination of educational research, aggregated program data, and aggregated data on faculty, applicants, students, and graduates

- Participation in PAEA surveys, compliance with additional requests for data and information, and membership entitle institutional and individual members in good standing access to reports and basic data
- Individual survey participant data must remain secure and not be distributed to individuals beyond the PAEA Research Team or to those entrusted with the data, such as PAEA-authorized contractors
- To protect sensitive information, such as faculty salaries and some demographics, data will only be reported if the aggregate data (i.e., the "n") exceeds four values. PAEA reserves the right to restrict access to certain fields that have the potential to associate sensitive data with an individual or institution (PAEA, 2018d)

Throughout the course of this study, data was stored on a locked computer and utilized only for this research study as described. Appendix E contains verification from Peter Jankowski, Bethel University IRB Chair, that this study met the criteria for Level 3 IRB approval through the Bethel University Ed.D. program director as well as the final IRB approval from Craig Paulson, Ed.D. program director. Appendix F contains the confirmation email from Donovan Lassard, Director of Research for PAEA, that the author was authorized to receive and analyze the data used in this study. Following completion of the study, the data remained in de-identified form on the researcher's password protected computer in accordance with PAEA's data storage requirements. A non-disclosure agreement (Appendix G) signed by the researcher and PAEA stipulates that the researcher will not copy or distribute the data without permission.

Chapter 4: Results

Introduction

The purpose of this study was to examine the choice process of URM and non-URM students as they considered the PA profession and application to PA school. The racial and ethnic compositions of the PA profession and recent matriculating classes of PA students show that Black, Hispanic, and Native American PAs continue to be underrepresented in the profession (United States Census Bureau, 2017; AAPA, 2017). The benefits of increasing diversity in the PA profession include improved access to care for underserved patient populations (Coplan, Cawley, & Stoehr, 2013; Komaromy et al., 1996; Muma, Kelley, and Lies, 2010; Rabinowitz, Diamond, Veloski, & Gayle, 2000), improved quality of care through race-concordant care (Cooper, et al., 2003; Eskes, Salisbury, Johannsson, & Chene, 2013, Institute of Medicine [IOM], 2004; King et al., 2004; Laveist, Nuru-Jeter, & Jones, 2003; Street, O'Malley, Cooper, & Haidet, 2008; Traylor, Schmittdiel, Uratsu, Mangione, & Subramanian, 2010), and increasing cultural competency among graduates of medical programs with higher rates of ethnic and racial diversity (Saha, Guiton, Wimmers, & Wilkerson, 2008).

For this study, CASPA and MSS data was analyzed to gain insight into the choice processes of applicants and matriculants to PA school. The population and research questions for this study were determined using Hadinger's Conceptual Model of Minorities in Medical School Admissions as a theoretical framework (Hadinger, 2017). Hadinger's model outlined types of influences that shape the choice process of URM applicants to medical school, and suggested that the influences on URM applicants can be different than influences on non-URM applicants to medical school. The current study

used Hadinger's framework and applied it to a new population, PA school applicants and matriculants, to determine if her framework was valid for a different population.

Research Questions

This study was designed to answer the following research questions:

1. What difference, if any, exists between how URM and non-URM PA school applicants first learned about the PA profession?
2. What difference, if any, exists between URM and non-URM PA school applicants, in what they report as the most influential factor in bringing them to the PA profession/PA education?
3. What difference, if any, exists between when in their education process or careers URM and non-URM PA school matriculants definitely decided to become a PA?
4. What differences, if any, exist between URM and non-URM PA school matriculants, in how they report various factors as absent, a negative influence, a positive influence, or neutral in their choice process when deciding to become a PA?

This chapter provides descriptive statistics and chi-square analysis of the CASPA applicant data and MSS data related to the research questions. Chi-square analysis for this study was performed using SPSS version 25.

Response Rate and Participant Demographics

CASPA Data. In the 2016-2017 CASPA cycle, 26,768 individuals submitted a CASPA application. Of those completed applications, 24,536 participants responded to the race and ethnicity demographic questions (91.7% response rate) making them eligible

for inclusion in the analysis for research questions one and two. In the 2016-2017 CASPA application cycle, 0.31% of respondents self-identified as American Indian, 6.1% as Black or African American, and 10.6% as Hispanic (CASPA, 2017b). Additionally, 3.19% selected multiple race and/or ethnicity identifications. Within the group of participants that identified with multiple racial or ethnic categories, 374 included at least one designation in a URM group. These participants were included with those who reported a single URM race or ethnicity, bringing the total number of URM participants in the 2016-2017 CASPA cycle to 2,912, comprising 18.4% of the total CAPSA applicant pool.

Non-URM participants in this study were defined as those who selected Non-Hispanic White, Asian, Hawaiian, Pacific Islander, or any combination of those options without the inclusion of a defined URM race or ethnicity. A total of 19,624 non-URM participants were eligible for inclusion in the study, comprising 73.3% of all applicants.

Table 2

Categorization of 2016-2017 CASPA participants

Self-Identified Race or Ethnicity Category	Total Number	% of All CASPA Participants
URM	4912	18.4
Non-URM	19624	73.3
No Response	2232	8.3
Total	26768	100.0

Matriculating Student Survey. In 2017, 4,050 PA school matriculants respondents to the MSS. Of the 4,050 matriculating PA students who completed the MSS, 4,007 answered the race and ethnicity questions (98.9% response rate) making

them eligible for inclusion in the analysis for research questions three and four. Among the 2017 MSS participants, 1.3% identified as American Indian or Alaskan Native, 3.7% as Black or African American, and 8.1% as Hispanic, Latino, or Spanish in origin (PAEA, 2018c). In addition, 3.4% of MSS participants selected multiple races and/or ethnicities (PAEA, 2018c). As with the CASPA applicant data, participants who made multiple selections were included in the URM category if they selected any race or ethnicity within the URM definition. This method of participant categorization led to a total of 487 participants in the URM group and 3,520 in the non-URM group, for a total of 4,007 eligible participants for research questions three and four.

Table 3

Categorization of 2017 MSS participants

Self-Identified Race or Ethnicity Category	Total Number	% of All CASPA Participants
URM	487	12.0
Non-URM	3520	86.9
No Response	43	1.1
Total	4,050	100.0

Research Question One

Research question one was: what difference, if any, exists between how URM and non-URM PA school applicants first learned about the PA profession? Based on a review of the literature, the null hypothesis was that no differences exist between how URM and non-URM PA school applicants first learned about the PA profession. The alternate hypothesis was that significant differences exist between how URM and non-URM PA school applicants first learned about the PA profession.

The data for this research question was taken from an item on the CASPA applicant data that asked participants to report the single source of information from which they first learned about the PA profession. In the 2016-2017 cycle, 21,282 participants were eligible for inclusion in the analysis for research questions one (79.5% of all CASPA applicants) because they completed both this CASPA item and the race and ethnicity data section. Among these eligible CASPA participants, 4,328 self-identified as URM participants and 16,954 as non-URM participants. Descriptive statistics regarding participants' responses are found in Table 4. Table 4 shows that the three most commonly cited sources of information for all participants were health related work, another friend or relative, and a personal healthcare provider. These three options combined accounted for 60.8% of all responses.

Table 4

Where CASPA Participants First Learned About the PA Profession

	URM	% of URM	Non-URM	% of Non-URM	Total	% of All Participants
Another friend/relative	887	18.1	4059	20.7	4946	20.2
Book/article/film/TV	59	1.2	175	0.9	234	1.0
Career or Guidance Counselor	99	2.0	377	1.9	476	1.9
Career-Eco Virtual Fair	6	0.1	14	0.1	20	0.1
HCOP	46	0.9	57	0.3	103	0.4
Health Professions Advisor	324	6.6	1065	5.4	1389	5.7
Health Related Work	1350	27.5	4745	24.2	6095	24.8
PA Focus	18	0.4	73	0.4	91	0.4
PA Program Literature	117	2.4	266	1.4	383	1.6
PAEA or AAPA Literature	14	0.3	43	0.2	57	0.2
Parent	221	4.5	1394	7.1	1615	6.6
Personal healthcare provider	710	14.5	3163	16.1	3873	15.8
Project Access	0	0	1	0	1	0
Teacher or Professor	477	9.7	1522	7.8	1999	8.1

Chi-square tests of independence were calculated to determine if a dependent relationship existed between URM status and whether applicants reported that each single source of information was the first place that they learned about the PA profession. Using an alpha value of 0.01, a dependent relationship was identified between URM status and eight of the fourteen possible sources of information (Table 5). Two of the options, Career-Eco Virtual Fair and Project Access, had expected counts of less than 5, making the results of the chi-square invalid. An expected count of less than five out of the 21,282 participants means that less than 0.00023% of participants were expected to select these options. Based on the low percentage of participants who selected these options, the researcher determined that no further statistical analysis of these two options was needed.

Chi-square analysis of the data showed that URM CASPA applicants were significantly more likely than non-URM CASPA applicants to report that they learned about the PA profession from a teacher or professor ($\chi 2$ (1, N=1999)=20.067, p=<0.001), health professions advisor ($\chi 2$ (1, N=1389)=10.054, p=0.002), health related work experience ($\chi 2$ (1, N=6095)=22.972, p=<0.001), PA program literature ($\chi 2$ (1, N=383) =26.937, p=<0.001), or an HCOP ($\chi 2$ (1, N=103)= 39.222, p=<0.001). In contrast, URM participants were significantly less likely than non-URM participants to report that they first heard about the PA profession from a parent ($\chi 2$ (1, N=1615)= 43.336, p=<0.001), another friend or relative ($\chi 2$ (1, N=4946)=16.833, p=<0.001), or a personal healthcare provider to them or their family ($\chi 2$ (1, N=38773)= 8.179, p=0.004). In total, URM and non-URM CASPA participants had significantly different responses related to eight of the twelve options that had enough responses to be analyzed by a chi-square test. This

supports the hypothesis that a difference exists between how URM and non-URM PA school applicants first learn about the PA profession.

Table 5

Chi-Square Analysis of Research Question One Responses

	URM	Expected Count	Non-URM	Expected Count	χ^2	df	P
Another friend/relative	887	990.2	4059	3955.8	16.833	1	**<.001**
Book/article/film/TV	59	46.8	175	187.2	3.981	1	.046
Career or Guidance Counselor	99	95.3	377	380.7	.184	1	.668
Career-Eco Virtual Fair	6	4	14	16.0	1.245	1	Not Valid
HCOP	46	20.6	57	82.4	39.222	1	**<.001**
Health Professions Advisor	324	278.1	1065	1110.9	10.054	1	**.002**
Health Related Work	1350	1220.2	4745	4874.8	22.972	1	**<.001**
PA Focus	18	18.2	73	72.8	.003	1	.954
PA Program Literature	117	76.7	266	306.3	26.937	1	**<.001**
PAEA or AAPA Literature	14	11.4	43	45.6	.736	1	.391
Parent	221	323.3	1394	1291.7	43.336	1	**<.001**
Personal healthcare provider	710	775.4	3163	3097.6	8.179	1	**.004**
Project Access	0	0.2	1	0.8	.250	1	Not Valid
Teacher or Professor	477	400.2	1522	1598.8	20.067	1	**<.001**

Research Question Two

Research question two was: what difference, if any, exists between URM and non-URM PA school applicants, in what they report as the most influential factor in bringing them to the PA profession/PA education? The null hypothesis was that no differences exist between URM and non-URM PA school applicants, in what they reported as the most influential factor in bringing them to the PA profession/PA education. The alternate hypothesis for this question was that significant differences exist

between URM and non-URM PA school applicants, in what they reported as the most influential factor in bringing them to the PA profession/PA education.

The data for this question was taken from an item on the CASPA application which asked participants to report the most influential factor in bringing them to the PA profession/PA education. The response rate for this item was slightly lower than that of the item used in research question one. In 2016-2017, 20,540 participants (76.7% of all CASPA participants) completed the CASPA race and ethnicity questions as well as this item, leading to 4,186 URM participants and 16,354 non-URM participants eligible for inclusion in the analysis for research question two. Descriptive statistics regarding responses for this item are reported in Table 6. This table shows that almost half of all applicants stated that health related work was the most influential factor bringing them to the PA profession. The next most commonly selected option was a personal healthcare provider, which was selected by 10.1% of all participants.

Table 6

Most Influential Factor Bringing CASPA Participants to the PA Profession

	URM	% of URM	Non-URM	% of Non-URM	Total	% of All Participants
Another friend/relative	355	7.2	1658	8.4	2013	8.2
Book/article/film/TV	29	0.6	93	0.5	122	0.5
Career or Guidance Counselor	45	0.9	143	0.7	188	0.8
Career-Eco Virtual Fair	0	0	0	0	0	0
HCOP	32	0.7	52	0.3	84	0.3
Health Professions Advisor	119	2.4	412	2.1	531	2.2
Health Related Work	2382	48.5	9588	48.9	11970	48.8
PA Focus	159	3.2	510	2.6	669	2.7
PA Program Literature	144	2.9	369	1.9	513	2.1
PAEA or AAPA Literature	23	0.5	76	0.4	99	0.4
Parent	233	4.7	900	4.6	1133	4.6
Personal healthcare provider	512	10.4	1973	10.1	2485	10.1
Project Access	0	0.1	5	0.0	8	0.0
Teacher or Professor	150	3.1	575	2.9	725	3.0

Chi-square tests of independence were used to analyze participants' responses, and the results are located in Table 7. As with the item in research questions one, Chi-Square analysis revealed an expected count of less than five for URM participants who stated that Projected Access was the most influential factor in their decision, making chi-square analysis invalid. The researcher determined that no further statistical analysis was needed, due to the small percentage of participants who selected this option.

Chi-square analysis of the data showed that URM CASPA applicants were significantly more likely than non-URM CASPA applicants to report that either a friend or relative (χ^2 (1, N=2013)=7.785, p=0.005), an HCOP (χ^2 (1, N=84)=17.200, p=<0.001), or PA program literature (χ^2 (1, N=513)=21.209, p=<0.001) were the most influential

factor in bringing them to the PA profession/PA education. The total number of participants who selected HCOP was 84 (0.3% of participants), and the total number that selected PA program faculty or literature was 513 (2.1% of participants), reflecting that even though significant differences existed between the groups' responses, these options were not commonly selected by either group.

Table 7

Chi-Square Analysis of Research Question Two Responses

	URM	Expected Count	Non-URM	Expected Count	χ^2	df	P Value
Another friend/relative	355	403.0	1658	1610.0	7.785	1	.005
Book/article/film/TV	29	24.4	93	97.6	1.077	1	.299
Career or Guidance Counselor	45	37.6	143	150.4	1.815	1	.178
Career-Eco Virtual Fair	0	0	0	0			Not Valid
HCOP	32	16.8	52	67.2	17.200	1	<.001
Health Professions Advisor	119	106.3	412	424.7	1.938	1	.164
Health Related Work	2382	2396.3	9588	9573.7	.210	1	.647
PA Focus	159		510			1	.014
PA Program Literature	144	102.7	369	410.3	21.209	1	<.001
PAEA or AAPA Literature	23	19.8	76	79.2	.641	1	.423
Parent	233	226.8	900	906.2	.221	1	.639
Personal healthcare provider	512	497.5	1973	1987.5	.589	1	.443
Project Access	3	1.6	5	6.4			Not Valid
Teacher or Professor	150	145.1	575	579.9	.210	1	.647

Analysis of the data revealed no factors on this CASPA item that URM participants were significantly less likely to select than non-URM participants, and three items that URM participants were more likely than non-URM participants to select. Results from data analysis support the hypothesis that a difference exists between what

URM and non-URM PA school applicants report as the most influential factor in bringing them to the PA profession/PA education.

Research Question Three

Research question three was: what difference, if any, exists between when in their education process or careers URM and non-URM PA school matriculants definitely decided to become a PA? Based on a review of the literature, the null hypothesis was that no differences exist between when URM and non-URM matriculants reported that they decided to become a PA. The alternate hypothesis was that significant differences exist between when URM and non-URM matriculants reported that they decided to become a PA.

The data for this research questions was taken from an item on the MSS, which asked participants, "When did you definitely decide to become a physician assistant?" On this MSS item in 2017, 3,930 of MSS participants (97.0% of all MSS participants) responded, giving a response rate of 98.1% of eligible participants. Descriptive statistics regarding participants' responses are found in Table 8. The descriptive statistics show that during the first two years of college was the most popular choice overall, with 25.8% of all participants reporting that this was when they decided to pursue the PA profession, and no dependent relationship was seen between URM status and this selection. The next most popular selection was after receiving a bachelor's degree, which was selected by 22.9% of all participants.

Table 8

When Matriculants Decided to Become a PA

	URM	% of URM	Non-URM	% of Non-URM	Total	% of All Participants
Before High School	8	1.6	58	1.6	66	1.6
During HS/Before College	48	9.9	647	18.4	695	17.3
During First Two Years of College	111	22.8	921	26.2	1032	25.8
After Receiving Associate's Degree	30	6.2	67	1.9	97	2.4
During Junior Year of College	67	13.8	542	15.4	609	15.2
During Senior Year of College	50	10.3	259	7.4	309	7.7
After Receiving a Bachelor's Degree	136	27.9	783	22.2	919	22.9
After Receiving an Advanced Degree	29	6.0	174	4.9	203	5.1

Chi-square tests of independence were calculated to determine if a dependent relationship existed between URM status and when matriculants reported that they decided to become a PA. Results of the chi-square analysis are located in Table 9. Using an alpha value of 0.01 to determine significance, a dependent relationship was identified between URM status and three of the eight possible options. On this item, URM participants were significantly more likely than non-URM participants to report that they decided to become a PA after receiving an associate's degree (χ^2 (1, N=97)= 32.817, p=<0.001), or after receiving a bachelor's degree (χ^2 (1, N=919)=7.814, p=0.005). URM participants were significantly less likely than non-URM participants to report that they decided to pursue the profession during high school/before college (χ^2 (1, N=1032)=21.684, p=<0.001).

Table 9

Chi-Square Analysis of Research Question Three Responses

	URM	Expected Count	Non-URM	Expected Count	χ^2	df	P Value
Before High School	8	8	58	58	.000	1	.993
During HS/Before College	48	84.5	647	610.5	21.684	1	<.001
During First Two Years of College	111	125.4	921	906.6	2.544	1	.111
After Receiving Associate's Degree	30	11.8	67	85.2	32.817	1	<.001
During Junior Year of College	67	74.0	542	535.0	.893	1	.345
During Senior Year of College	50	37.6	259	271.4	5.087	1	.024
After Receiving a Bachelor's Degree	136	111.7	783	807.3	7.814	1	.005
After Receiving an Advanced Degree	29	24.7	174	178.3	.910	1	.340

In total, significant differences existed between the responses of URM and non-URM participants for three of the eight possible options. This supports the hypothesis that a difference exists between when URM and non-URM matriculants to PA school report that they ultimately decided to pursue the PA profession.

Research Question Four

Research question four was: what differences, if any, exist between URM and non-URM PA school matriculants, in how they report various factors as absent, a negative influence, a positive influence, or neutral in their choice process when deciding to become a PA? Based on a review of the literature, the null hypothesis was that no differences exist between how URM and non-URM PA school matriculants reported various factors as absent, a negative influence, a positive influence, or neutral in their choice process. The alternative hypothesis was that significant differences exist between

how URM and non-URM PA school matriculants reported various factors as absent, a negative influence, a positive influence, or neutral in their choice process.

Data for question four was taken from a multi-part item on the MSS, which asked matriculants to rate 18 possible influences on their choice process when deciding to become a PA. The specific language from this item is listed in Appendix A. On the 2017 MSS, the response rates for each of the 18 options on this item ranged between 96.0% and 96.7% of the participants who also responded to race and ethnicity questions, making them eligible for inclusion in this study. The number of participants who selected each rating, along with total participant numbers and participation rate for each item can be found in Table 10. Table 10 provides an overview of participant responses, which will be further analyzed in subsequent sections of this chapter. In Table 10, it is clear that very few participants rated any of the potential influences as negative in their choice processes.

Table 10

Summary of Responses Related to Research Question Four

	Absent	Positive	Negative	Neutral	Total Participants	Participation Rate of Eligible MSS Participants
AAPA website/literature	1160	1001	6	1707	3874	96.7
PAEA website/literature	1352	843	4	1663	3862	96.4
PA Program literature	671	2127	12	1036	3846	96.0
College/Campus admissions department	543	2110	30	1175	3858	96.3
Public Media	764	1503	21	1575	3863	96.4
Social Media	805	1247	9	1805	3866	96.5
Project Access	2208	185	3	1450	3846	96.0
Previous Healthcare Experience	91	3626	22	132	3871	96.6
Previous Military Experience	3004	175	5	663	3847	96.0
PA Program Faculty/Staff	498	2770	15	580	3863	96.4
Friend	400	2656	21	792	3869	96.6
Family member	594	2265	52	940	3851	96.1
Career Counselor/ Teacher	1298	1139	40	1375	3852	96.1
Physician for me/my family	675	2111	39	1035	3860	96.3
Other physician acquaintance	675	2298	40	844	3857	96.3
PA for me/my family	820	2266	18	753	3857	96.3
Other PA acquaintance	548	2794	16	493	3851	96.1
Other health professional	667	2365	22	778	3832	96.6

Absent. For each of the factors that participants could rate in this MSS item, the first option they could select was that they "Did not use/have not heard of" each factor. For this study, the author coded the selection of "Did not use/have not heard of" as indicating that a factor was absent from an individual's choice process. Descriptive statistics of the number of participants who rated each item as absent in their choice process is located in Table 11. Table 11 shows that previous healthcare experience was the only factor that was rated as absent by less than 10% of all participants.

Table 11

Participants who Reported that Influences Were Absent

	URM	% of URM	Non-URM	% of Non-URM	Total	% of All Participants
AAPA website/literature	122	25.1	1038	29.5	1160	28.9
PAEA website/literature	144	29.6	1208	34.3	1352	33.7
PA Program literature	67	13.8	604	17.2	671	16.7
College/Campus admissions department	76	15.6	467	13.3	543	13.6
Public Media	109	22.4	655	18.6	764	19.1
Social Media	101	20.7	704	20.0	805	20.1
Project Access	259	53.2	1949	55.4	2208	55.1
Previous Healthcare Experience	23	4.7	68	1.9	91	2.3
Previous Military Experience	340	69.8	2664	75.7	3004	75.0
PA Program Faculty/Staff	76	15.6	422	12.0	498	12.4
Friend	54	11.1	346	9.8	400	10.0
Family member	87	17.9	507	14.4	594	14.8
Career Counselor/ Teacher	161	33.1	1137	32.3	1298	32.4
Physician for me/my family	91	18.7	584	16.6	675	16.8
Other physician acquaintance	91	18.7	584	16.6	675	16.8
PA for me/my family	103	21.1	717	20.4	820	20.5
Other PA acquaintance	84	17.2	464	13.2	548	13.7
Other health professional	96	19.7	571	16.2	667	16.6

Chi-square tests of independence were calculated to determine if a dependent relationship existed between URM status and whether MSS participants reported that a single influence was absent from their choice process. Using an alpha value of 0.01, a significant difference between the URM and non-URM participants was identified in two of the 18 possible factors. In their responses, URM participants were significantly less likely than non-URM participants to report that previous military experience was absent from their choice processes (χ^2 (1, N=3004)=7.846, p=0.005), and significantly more likely to report that previous health care experience was absent (χ^2 (1, N=91)=15.015, p=<0.001). Results of the chi-square analyses can be found in Table 12.

Table 12

Chi-Square Analysis of Absent Factors

	URM	Expected Count	Non-URM	Expected Count	χ^2	df	P Value
AAPA website/literature	122	141.0	1038	1019.0	4.095	1	.043
PAEA website/literature	144	164.3	1208	1187.7	4.316	1	.038
PA Program literature	67	81.6	604	589.4	3.550	1	.060
College/Campus admissions department	76	66.0	467	477.0	1.997	1	.158
Public Media	109	92.9	655	671.1	3.949	1	.047
Social Media	101	97.8	704	707.2	.146	1	.703
Project Access	259	268.4	1949	1936.6	.827	1	.363
Previous Healthcare Experience	23	11.1	68	79.9	15.015	1	**<.001**
Previous Military Experience	340	365.1	2664	2638.9	7.846	1	**.005**
PA Program Faculty/Staff	76	60.5	422	437.5	5.143	1	.023
Friend	54	48.6	346	351.4	.754	1	.385
Family member	87	72.2	507	521.8	4.059	1	.044
Career Counselor/ Teacher	161	157.8	1137	1140.2	.112	1	.737
Physician for me/my family	91	82.0	584	593.0	1.340	1	.247
Other physician acquaintance	91	82.0	584	593.0	1.340	1	.247
PA for me/my family	103	99.7	717	720.3	.160	1	.689
Other PA acquaintance	84	66.6	464	481.4	5.993	1	.014
Other health professional	96	81.1	571	585.9	3.758	1	.053

Positive Influences. Participants had the option to indicate that any of the 18 possible factors, "Made me WANT to become a PA." For this study, the author coded the selection of "Made me WANT to become a PA" as indicating that a factor was a positive influence on an individual's choice process. Descriptive statistics of the number of URM and non-URM MSS participants who rated each item as positive is located in

Table 13. The factor that was most commonly rated as positive was previous healthcare experience, with 90.5% of participants rating previous healthcare experience as a positive influence. The next factors that were most frequently rated as positive were PA program faculty or staff (69.1%) and other PA acquaintance (69.7%).

Table 13

Participants who Reported that Influences Were Positive

	URM	% of URM	Non-URM	% of Non-URM	Total	% of All Participants
AAPA website/literature	141	29.0	860	24.4	1001	25.0
PAEA website/literature	118	24.2	725	20.6	843	21.0
PA Program literature	265	54.4	1862	52.9	2127	53.1
College/Campus admissions department	241	49.5	1869	53.1	2110	52.7
Public Media	161	33.1	1342	38.1	1503	37.5
Social Media	153	31.4	1094	31.1	1247	31.1
Project Access	24	4.9	161	4.6	185	4.6
Previous Healthcare Experience	417	85.6	3209	91.2	3626	90.5
Previous Military Experience	38	7.8	137	3.9	175	4.4
PA Program Faculty/Staff	308	6..2	2462	69.9	2770	69.1
Friend	294	60.4	2362	67.1	2656	66.3
Family member	234	48.0	2031	57.7	2265	56.5
Career Counselor/ Teacher	133	27.3	1006	28.6	1139	28.4
Physician for me/my family	240	49.3	1871	53.2	2111	52.7
Other physician acquaintance	257	52.8	2041	58.0	2298	57.3
PA for me/my family	253	52.0	2013	57.2	2266	56.6
Other PA acquaintance	307	63.0	2487	70.7	2794	69.7
Other health professional	266	54.6	2099	59.6	2365	59.0

Chi-square analysis for each possible factor demonstrated that URM participants were significantly more likely than non-URM participants to report that they considered

their previous military experience (χ^2 (1, N=175)=15.666, p=<0.001) to be a positive influence on their decision to pursue the PA profession. Non-URM participants were significantly more likely than URM participants to say that the following sources of information were positive influences in their choice process: previous healthcare experience (χ^2 (1, N=3626)=15.252, p=<0.001), PA program faculty and staff (χ^2 (1, N=2770)=8.996, p=0.003), friend (χ^2 (1, N=2656)=8.677, p=0.003), family member (χ^2 (1, N=2265)=16.210, p=<0.001), or other PA acquaintance (χ^2 (1, N=2794)=11.751, p=0.001). Results of the chi-square analyses of absent factors can be found in Table 14.

Table 14

Chi-Square Analysis of Positive Influences

	URM	Expected Count	Non-URM	Expected Count	χ^2	df	P Value
AAPA website/literature	141	121.7	860	879.3	4.666	1	.031
PAEA website/literature	118	102.5	725	740.5	3.400	1	.065
PA Program literature	265	258.5	1862	1868.5	.395	1	.530
College/Campus admissions department	241	256.4	1869	1853.6	2.236	1	.135
Public Media	161	182.7	1342	1320.3	4.683	1	.030
Social Media	153	151.6	1094	1095.4	.023	1	.880
Project Access	24	22.5	161	162.5	.122	1	.727
Previous Healthcare Experience	417	440.7	3209	3185.3	15.252	1	<.001
Previous Military Experience	38	21.3	137	153.7	15.666	1	<.001
PA Program Faculty/Staff	308	336.7	2462	2433.3	8.996	1	.003
Friend	294	322.8	2362	2333.2	8.677	1	.003
Family member	234	275.3	2031	1989.7	16.210	1	<.001
Career Counselor/ Teacher	133	138.4	1006	1000.6	.339	1	.560
Physician for me/my family	240	256.6	1871	1854.4	2.573	1	.109
Other physician acquaintance	257	279.3	2041	2018.7	4.749	1	.029
PA for me/my family	253	275.4	2013	1990.6	4.775	1	.029
Other PA acquaintance	307	339.6	2487	2454.4	11.751	1	.001
Other health professional	266	287.4	2099	2077.6	4.441	1	.035

Negative Influences. Participants in the MSS had the option to indicate that any of the 18 possible factors, "Made me NOT want to become a PA." For this study, the author coded the selection of "Made me NOT want to become a PA" as indicating that a factor was a negative influence on an individual's choice process. Descriptive statistics

of the number of URM and non-URM MSS participants who rated each item as negative are located in Table 15.

Table 15

Participants who Reported that Influences Were Negative

	URM	% of URM	Non-URM	% of Non-URM	Total	% of All Participants
AAPA website/literature	2	0.4	4	0.1	6	0.1
PAEA website/literature	2	0.4	2	0.1	4	0.1
PA Program literature	2	0.4	10	0.3	12	0.3
College/Campus admissions department	5	1.0	25	0.0	30	0.7
Public Media	5	1.0	16	0.5	21	0.5
Social Media	3	0.6	6	0.2	9	0.2
Project Access	1	0.2	2	0.1	3	0.1
Previous Healthcare Experience	3	0.6	19	0.5	22	0.5
Previous Military Experience	1	0.2	4	0.1	5	0.1
PA Program Faculty/Staff	2	0.4	13	0.4	15	0.4
Friend	3	0.6	18	0.5	21	0.5
Family member	7	1.4	45	1.3	52	1.3
Career Counselor/ Teacher	9	1.8	31	0.9	40	1.0
Physician for me/my family	8	1.6	31	34.3	39	1.0
Other physician acquaintance	4	0.8	36	1.0	40	1.0
PA for me/my family	4	0.8	14	0.4	18	0.4
Other PA acquaintance	2	0.4	14	0.4	16	0.4
Other health professional	5	1.0	17	0.5	22	0.5

Table 15 shows that both URM and non-URM MSS participants had low numbers of reported negative influences. An assumption of the chi-square test is that the expected count for at least 80 percent of the categories must be five or greater. Out of the 18 possible factors, family member was the only category for which the expected counts

were above five, making it the only one that could be analyzed with a chi-square test of independence. Chi-square analysis of the responses regarding family members did not indicate a dependent relationship with URM status (χ^2 (1, N=52)=0.084, p=0.771). The response numbers and expected numbers for all participants who rated factors as negative can be found in Appendix G.

Neutral Influences. The final rating that participants could give to each potential influence was that it had, "No influence on my decision to become a PA." For the purposes of this study, selection of the response "No influence on my decision to become a PA" was coded as identifying a source of information as a neutral influence. Descriptive statistics of the number of URM and non-URM MSS participants who rated each item as neutral is located in Table 16. Only 3.3% of participants rated previous healthcare experience as neutral, which correlates with the previously noted finding that 90.5% of all participants rated previous healthcare experience as positive in their choice process.

Table 16

Participants who Reported that Influences Were Neutral

	URM	% of URM	Non-URM	% of Non-URM	Total	% of All Participants
AAPA website/literature	200	41.1	1507	42.8	1707	42.6
PAEA website/literature	197	40.5	1466	41.6	1663	41.5
PA Program literature	123	25.3	913	25.9	1036	25.9
College/Campus admissions department	139	28.5	1036	29.4	1175	29.3
Public Media	186	38.2	1389	39.5	1575	39.3
Social Media	206	42.3	1599	45.4	1805	45.0
Project Access	177	36.3	1273	36.2	1450	36.2
Previous Healthcare Experience	20	4.1	112	3.2	132	3.3
Previous Military Experience	80	16.4	583	16.6	663	16.5
PA Program Faculty/Staff	75	15.4	505	14.3	580	14.5
Friend	111	22.8	681	19.3	792	19.8
Family member	132	27.1	808	23.0	940	23.5
Career Counselor/ Teacher	155	31.8	1220	34.7	1375	34.3
Physician for me/my family	125.8	24.8	914	26.0	1035	25.8
Other physician acquaintance	105	21.6	739	21.0	844	21.1
PA for me/my family	100	20.5	653	18.6	753	18.8
Other PA acquaintance	67	13.8	426	12.1	493	12.3
Other health professional	93	19.1	685	19.5	778	19.4

As with negative influences, no dependent relationships existed between URM status and the likelihood that an individual would rate any influence as neutral. The results of the chi-square tests of independence for relationships between URM status and the rating of a factor as neutral can be found in Table 17.

Table 17

Chi-Square Analysis of Neutral Influences

	URM	Expected Count	Non-URM	Expected Count	χ^2	df	P Value
AAPA website/literature	200	207.5	1507	1499.5	.533	1	.466
PAEA website/literature	197	202.1	1466	1460.9	.252	1	.616
PA Program literature	123	125.9	913	910.1	.103	1	.748
College/Campus admissions department	139	142.8	1036	1032.2	.163	1	.686
Public Media	186	191.4	1389	1383.6	.288	1	.592
Social Media	206	219.4	1599	1585.6	1.689	1	.194
Project Access	177	176.2	1273	1273.8	.006	1	.938
Previous Healthcare Experience	20	16.0	112	116.0	1.149	1	.284
Previous Military Experience	80	80.6	583	582.4	.006	1	.940
PA Program Faculty/Staff	75	70.5	505	509.5	.384	1	.536
Friend	111	96.3	681	695.7	3.203	1	.073
Family member	132	114.2	808	825.8	4.104	1	.043
Career Counselor/ Teacher	155	167.1	1220	1207.9	1.522	1	.217
Physician for me/my family	125.8	125.8	914	909.2	.280	1	.597
Other physician acquaintance	105	102.6	739	741.4	.083	1	.774
PA for me/my family	100	91.5	653	661.5	1.102	1	.294
Other PA acquaintance	67	59.9	426	433.1	1.087	1	.297
Other health professional	93	94.6	685	63.4	.036	1	.849

Question Four Summary. In summary, no dependent relationships existed between URM status and an individual's rating of a particular factor as negative or neutral on their choice process. Significant differences did exist between URM and non-URM participants in their ratings of two of the eighteen factors as absent, and six of the eighteen as positive. These differences allow for the rejection of the null hypothesis and

indicate that the alternate hypothesis is correct, that significant differences exist between URM and non-URM PA school matriculants in how they report various factors as absent, a negative influence, a positive influence, or neutral in their choice process when deciding to become a PA.

Results Summary

Chapter four contained data analysis related to the four research questions that were investigated with this study. Data was collected from CASPA applicants and MSS participants, and was analyzed using SPSS version 25. Table 18 presents a summary of the research hypotheses and correlating study results.

Research question one assessed where PA school applicants reported that they first learned about the PA profession. On this item, URM applicants were significantly less likely than non-URM applicants to report learning about the profession from a friend or relative ($p<0.001$), parent ($p<0.001$), or personal healthcare provider ($p=0.004$). On the same item, URM applicants were significantly more likely than non-URM applicants to report learning about the profession from health related work experience ($p<0.001$), HCOP ($p<0.001$), PA program literature ($p<0.001$), teacher or professor ($p<0.001$), or health professions advisor ($p=0.002$).

Research question two assessed the most influential factor that PA applicants reported as bringing them to the PA profession/PA education. On this item, URM applicants were significantly more likely than non-URM applicants to say that the most influential factor for them was a friend or relative ($p=0.005$), HCOP ($p<0.001$), or PA program faculty or literature ($p<0.001$). Data analysis revealed no factors that non-URM participants were significantly more likely than URM participants to select.

Table 18

Research Summary

Hypothesis	Result
$H1_0$: No differences exist between how URM and non-URM PA school applicants first learn about the PA profession	Reject
$H1_1$: Significant differences exist between how URM and non-URM PA school applicants first learn about the PA profession	
$H2_0$: No differences exist between URM and non-URM PA school applicants, in what they report as the most influential factor in bringing them to the PA Chi-square profession/PA education	Reject
$H2_1$: Significant differences exist between URM and non-URM PA school applicants, in what they report as the most influential factor in bringing them to the PA profession/PA education	
$H3_0$: No differences exist between when URM and non-URM PA school matriculants decided to become a PA	Reject
$H3_1$: Significant differences exist between when URM and non-URM PA school matriculants decided to become a PA	
$H4_0$: No differences exist between URM and non-URM PA school matriculants, in how they report various factors as absent, a negative influence, a positive influence, or neutral in their choice process when deciding to become a PA	Reject
$H4_1$: Significant differences exist between URM and non-URM PA school matriculants, in how they report various factors as absent, a negative influence, a positive influence, or neutral in their choice process when deciding to become a PA	

Research question three was designed to identify when PA school matriculants decided to become a PA. On this item, URM matriculants were significantly more likely than non-URM matriculants to report that they decided after receiving an associate's degree ($p<0.001$) or after receiving a bachelor's degree ($p=0.005$). URM matriculants were significantly less likely than non-URM matriculants to report that they decided during high school/before college ($p<0.001$).

Research question four examined how a series of possible influences were reported to impact the choice process of PA school matriculants considering the PA profession. On this item, participants were asked to rate each of the possible influences

as either absent, positive, negative, or neutral in their choice process. On the MSS, URM matriculants were significantly more likely than non-URM matriculants to report that previous healthcare experience was absent from their choice process ($p<0.001$), and significantly less likely than non-URM participants to report that the military was absent ($p=.005$). Additionally, URM matriculants were significantly more likely than non-URM matriculants to rate the military as a positive influence ($p<0.001$). Non-URM matriculants were significantly more likely than URM matriculants to rate five of the options as positive influences: previous healthcare experience ($p<0.001$), PA program faculty and staff ($p=0.003$), friend ($p=0.003$), family member ($p<0.001$), or other PA acquaintance ($p=0.001$).

Data for the negative ratings in research question four showed that very few participants rated any factors as negative in their choice process. No significant differences existed between URM and non-URM participants' responses, and the only factor that had enough participants to be analyzed using a chi-square was a family member ($p=0.771$). Similarly, no significant differences existed between URM and non-URM participants in their ratings of each factor as a neutral influence.

The results of this study were presented in Chapter four. Chapter five discusses these results, their limitations, potential study implications, and recommendations for further study.

Chapter V: Discussion

Overview of the Study

The purpose of this study was to examine the choice process of URM and non-URM applicants and matriculants to PA school as they considered the PA profession. The racial and ethnic compositions of the PA profession and recent matriculating classes of PA students show that Black, Hispanic, and Native American PAs continue to be underrepresented in the profession (United States Census Bureau, 2017; AAPA, 2017). The benefits of increasing diversity in the PA profession include improved access to care for underserved patient populations (Coplan, Cawley, & Stoehr, 2013; Komaromy et al., 1996; Muma, Kelley, and Lies, 2010; Rabinowitz, Diamond, Veloski, & Gayle, 2000), improved quality of care through race-concordant care (Cooper, et al., 2003; Eskes, Salisbury, Johannsson, & Chene, 2013, Institute of Medicine [IOM], 2004; King et al., 2004; Laveist, Nuru-Jeter, & Jones, 2003; Street, O'Malley, Cooper, & Haidet, 2008; Traylor, Schmittdiel, Uratsu, Mangione, & Subramanian, 2010), and increasing cultural competency among graduates of medical programs with higher rates of ethnic and racial diversity (Saha, Guiton, Wimmers, & Wilkerson, 2008).

This study was designed using Hadinger's Conceptual Model of Minorities in Medical School Admissions as a theoretical framework (Hadinger, 2017). Hadinger's model outlined types of influences that shape the choice process of URM applicants to medical school, and suggested that the influences on URM applicants can be different than influences on non-URM applicants to medical school. The current study used Hadinger's framework and applied it to a new population, PA school applicants and matriculants, to determine if her framework was valid for a different population.

Chapter five provides an overview of the study, major findings, and an interpretation of the results using current literature as a context. Additionally, chapter five will address the implications and limitations of this study, as well as possible topics for future research.

Research Questions

This study was designed to answer the following research questions: (1) What difference, if any, exists between how URM and non-URM PA school applicants first learned about the PA profession? (2) What difference, if any, exists between URM and non-URM PA school applicants, in what they report as the most influential factor in bringing them to the PA profession/PA education? (3) What difference, if any, exists between when URM and non-URM PA school matriculants decided to become a PA? (4) What differences, if any, exist between URM and non-URM PA school matriculants, in how they report various factors as absent, a negative influence, a positive influence, or neutral in their choice process when deciding to become a PA?

The first and second questions were addressed using CASPA applicant data, and for the third and fourth questions, MSS data was analyzed for dependent relationships between URM status and individuals' responses. The data for all four research questions was analyzed with chi-square tests for independence, and significant relationships were defined by a resulting significance level of <0.01.

Major Findings

Research Questions One and Two. The results of research questions one and two reflected the responses of applicants to PA school when asked about the first place they learned about the PA profession and what the most significant influence was when

deciding to pursue the PA profession. Although these questions ask about different aspects of the choice process, they both assessed the same 14 possible influences or sources of information and the role those influences played in each individual's choice process. Hossler and Gallagher (1987) first identified the phases involved with choosing a college based upon specific influences. St. John and colleagues (Paulsen & St. John, 2002); St. John & Asker, 2001) expanded the model of Hossler and Gallagher to develop the student choice theory, which states that educational attainment varies across racial and ethnic groups as a result of habitus. The findings for research questions one and two supported the student choice theory, as influences were reported to be different for URM and non-URM applicants.

Figure 4 contains a visual representation of the responses to both questions. In Figure 4, the significant results from research questions one and two were categorized according to the five previously defined contexts, which were developed based on Perna's (2006) theoretical contexts with the addition of the PA profession as a unique source of information. This figure illustrates that URM applicants to PA school were significantly less likely to report that they learned about the PA profession from personal relationships including friend, parents, and healthcare provider. At the same time, URM applicants were more likely than non-URM applicants to report that a friend or relative was the most influential factor in their ultimate decision to pursue the PA profession. This combination of findings supports previous research identifying a lack of guidance and social support for URM individuals in their choice processes (Freeman, Landry, Trevina, Grand, & Shea, 2016; Hadinger, 2017). Freeman, Landry, Trevina, Grand, and Shea interviewed college students interested in medicine, and found that these

prospective students reported inadequate guidance, mentoring, and social support as barriers to applying to medical school. Hadinger (2017) interviewed URM medical students and found that they commonly cited a lack of guidance and social support as the primary barriers in their choice processes, but also identified guidance and social support as primary influences on their choice processes. Hadinger concluded that social support, often from personal relationships, is particularly crucial for URM applicants to medical school. The lack of perceived social support may be a contributing factor to the disproportionately low numbers of URM applicants to medical school.

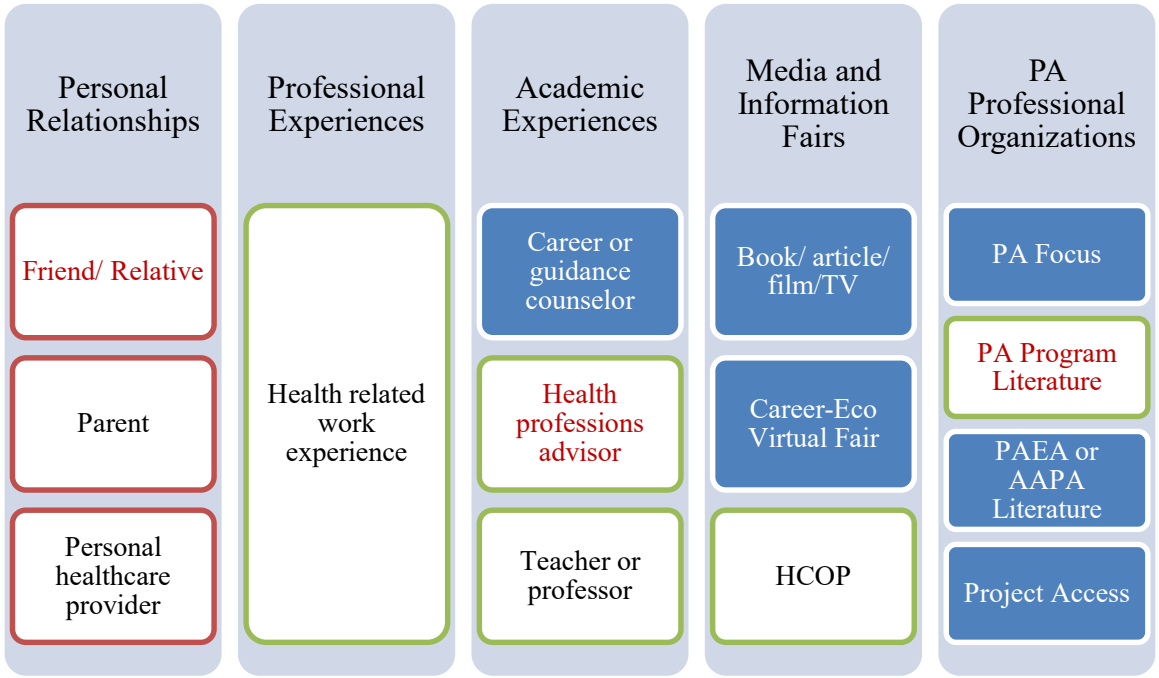

Figure 4. Synthesis of Responses for Research Questions One and Two

One notable finding in the data that was unrelated to the research questions for this study was the same three sources of information most commonly cited as the place that applicants first learned about the profession were also the three most commonly reported as the most influential factor in bringing them to the PA profession. Table 19 outlines the percentage of all participants who reported that health related work experience, another friend or relative, or a personal healthcare provider were part of their choice process.

Table 19

Most Frequent Responses for Research Questions One and Two

	Percentage of participants who reported as where they first learned about the PA profession	Percentage of participants who reported as the most influential factor in bringing them to the PA profession
Previous healthcare work experience	24.8	48.8
Another friend or relative	20.2	10.1
Personal healthcare provider	15.8	8.2

The three options in Table 19 were the most commonly selected options for both items on CASPA, which may indicate that a relationship exists between where an individual first learns about the profession and the likelihood that they will consider that influence to be the most important factor in their decision process. Table 19 also highlights that these three sources of information appear to have a large impact on applicants' choice processes, and are potential contact points that PA professional organizations could utilize to reach individuals who may consider the PA profession down the road. In particular, the fact that personal healthcare providers have a significant

impact on PA school applicants should be a reminder to practicing PAs that they can have an impact on their patients' career choices, which can be used to encourage and support URM patients. In a review of national healthcare data, Staton, Bhosle, Camacho, Feldman, & Balkrishnan (2007) found that nonwhite patients were more likely than white patients to see a PA as their healthcare provider, which also suggests that PAs can be positive influences for URM individuals.

Research Question Four. This section contains the discussion of the results for research question four which correlate to the results of research questions one and two. Research question four was designed to analyze the reported influences on the choice processes of matriculants to PA school, giving insights similar to those of research questions one and two, but with slightly different options and with a different population. The results for research question three will be covered following the discussion of question four.

Figure 5 represents the significant findings from the multi-part MSS item that asked students to identify each possibly influence as absent, positive, negative, or neutral in their choice process. This item contained 18 total options that participants could rate. Figure 5 illustrates that previous military experience is the factor with the most unique influence on URM matriculants to PA school. On the MSS, URM matriculants were significantly more likely than non-URM matriculants to report that previous military experience was both present in their choice process and that the military was a positive influence. The PA profession was first developed to train army medics into a medical profession (AAPA, 2018a), and historically strong ties between the military and many PA programs have been present (PA History Society, 2017). The data from question four

suggests that the military provides both information and a positive impression of the PA profession to URM military members, making the military a useful pathway for PA programs looking to recruit URM PA students.

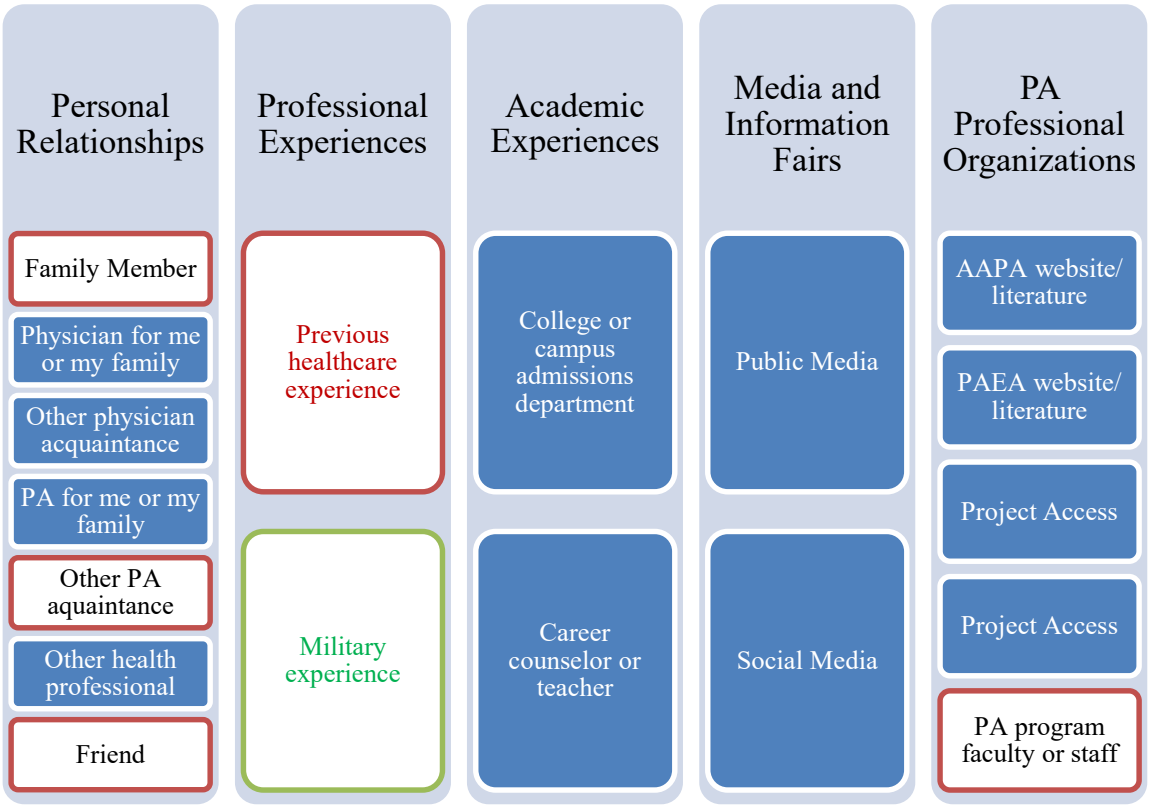

Figure 5. Synthesis of Responses for Research Question Four

Another distinct finding from the data for research question four was the low percentage of participants who ranked any of the 18 possible influences as negative. The choice of "family member" was the only option that had enough individual responses to meet the assumption of 80% of cells having an expected count of five, making it eligible

for analysis with chi-square. Analysis of the responses for the option of family member did not reveal any significant differences between the responses of URM and non-URM participants. The lack of negative ratings was likely related to the population that completed the MSS, which was comprised of individuals who had successfully matriculated into PA school. This population was selected intentionally, using Harper's anti-deficit achievement theory (2010). However, the limited population created the delimitation that individuals who ultimately decided not to pursue the PA profession were not included in the study. To learn about negative influences on choice process, a study would need to be done with a population including individuals who had not decided to apply to PA school. Just as no dependent relationships existed between URM status and negative ratings, no dependent relationships were seen among the neutral ratings. While respondents rated each possible source of information as neutral in their choice process, no significant differences existed between URM and non-URM participants.

The data related to positive influences for URM and non-URM matriculants to PA school did demonstrate several significant differences. As previously noted, the only influence that URM matriculants were more likely than non-URM matriculants to rate as positive was the military. In contrast, five of the 18 options were more likely to be rated as positive by non-URM matriculants than URM matriculants. Similar to the results for research questions one and two, three of the differences were seen for influences under the category of personal relationships. The lack of positive ratings from URM participants aligns with previous research identifying a lack of guidance and social support for applicants to medical school (Freeman, Landry, Trevina, Grand, & Shea, 2016; Hadinger, 2017). Hadinger found that even successful matriculants to medical were

less likely to report positive influences from personal relationships, just as the successful matriculants in this study reported less positive influences in their choice processes.

Previous health care experience was the only source of information that URM matriculants were both more likely to report as absent from their choice process, and less likely to rate as a positive influence. This combination of results may reflect issues with the general culture of medical practice, and the experience that URM employees and volunteers have in that setting. Results from research questions one and two demonstrated that previous healthcare experience was the most common initial source of information, as well as the most commonly selected choice for the most influential factor in all participants' choice processes. The combination of responses from URM participants related to their impressions and experiences in the healthcare environment suggest that further research is needed to understand the opportunities for and experiences of URM employees and volunteers in the healthcare setting.

A final concern regarding the results from research question four is the number of influences which were less likely to be perceived as positive for URM matriculants to PA school. On five out of the 18 potential influences (27.8%), URM matriculants were less likely to report that they were influenced positively as compared to non-URM matriculants. Although URM participants were not reporting these influences as being negative, the lack of positive ratings for five items correlates with Hadinger's findings (2017). Hadinger's qualitative research demonstrated that URM medical students frequently reported a lack positive influences including guidance and social support in their choice processes. In the PA school matriculant population, there appears to be significantly less positive influences impacting the choice processes of URM students.

In the past few years, PAEA has increased efforts to recruit diverse students through the development of Project Access (PAEA, 2018f) and promotion of Summer Health Professions Education programs (Summer Health Professions Education Program, 2017). Additionally, the United States government has developed HCOP programs to increase the participation of traditionally underrepresented students in medical programs (HRSA, 2018). Both Project Access and HCOPs were included as possible influences for MSS participants to rate. However, very few participants stated that either of these influences were present or positive in their choice processes. The lack of participants reporting Project Access or HCOPs as influences may reflect a lack of access to these programs, or may be the result of participants not recognizing the names of the programs to accurately report the impact of the programs. The findings of this study ultimately did not support the effectiveness of these programs, in contrast to several studies that have shown that post-baccalaureate/pre-medicine enrichment programs improve recruitment and retention of URM medical students (Agrawal, Vlaicu, and Carrasquillo, 2005; DiBaise, Salisbury, Hertelendy, and Muma, 2015; Grumbach, & Chen, 2006; Strayhorn & Demby, 1999; Giordani, et al., 2001).

Research Question Three. Research question three examined a different aspect of the choice process than questions one, two, and four by focusing on the timing of when PA school matriculants ultimately decided to become a PA. Descriptive analysis of the data for research question three showed that the most common times that matriculants reported deciding to become a PA were during the first two years of college (25.8%), after receiving a bachelor's degree (22.9%), and during high school/before college (17.3%). Understanding the timeline of decision-making by prospective students is

useful to PA programs and professional organizations that are trying to design recruitment strategies for prospective students. Although a large portion of successful matriculants (43.1%) had made the decision to become a PA before junior year of college, a total of 28.0% of all successful matriculants to PA school decided to pursue the profession after obtaining either a bachelor's or an advanced degree. Additionally, URM matriculants were significantly more likely to report that they decided to pursue the PA profession after obtaining either an associate's degree or a bachelor's degree, suggesting that PA programs should have strategies in place to recruit college graduates, particularly URM applicants, from the workforce. Additional research focused on recruiting applicants with completed degrees could aid PA programs in improving URM student recruitment.

Additionally, the data suggesting that URM applicants are significantly more likely to decide to pursue the profession later in their educational careers may have in impact on PA programs that have a pre-professional phase. Program that include pre-professional training are sometimes referred to as 3+2 or 4+2 programs (PAEA, 2017d), where the numbers refer to the number of years students spend in the undergraduate and graduate phases respectively. According to the PAEA Program Report 32 (PAEA, 2017d), 31 programs, or 14.8% of the accredited PA programs in 2016, reported having a pre-professional phase to their program. Programs with a pre-professional phase generally admit students to the PA program when they are applying for their undergraduate degree, typically right after high school. Students then progress through undergraduate courses, and once they successfully complete their undergraduate requirements, they move directly into the graduate phase of the program. While this

program design provides a clear pathway from high school to graduate school for students, PA programs should be aware that URM applicants are significantly less likely to have decided to pursue the PA profession by the time they complete high school. Admitting students to a pre-professional program immediately out of high school may create a system that is less likely to recruit URM applicants into PA school. Programs that are interested in developing a pre-professional phase for their programs may want to do further research into the impact that would have on the diversity of their program, and strategies that might help with intentional recruitment of URM PA applicants.

Implications and Discussion

The findings of this study provide insight into the choice processes of all PA school applicants, as well as some differences that may exist between the choice processes of URM and non-URM applicants and matriculants to PA school. The analysis of data from CASPA and the MSS suggest that differences exist that impact the choice processes of potential URM applicants to PA school. In particular, URM applicants and matriculants to PA school were less likely to report that they learned about the profession, or had positive influences from personal relationships during their choice process. At the same time, URM applicants reported that a friend or relative was the most impactful influence in their choice process, suggesting that personal relationships are very important in the choice process. Additionally, the military was shown to be a unique influence, both in its presence as an influence for URM applicants, and in their impression of the military as a positive influence. Overall, URM matriculants were less likely to rate several of the possible influences as positive, which may reflect a lack of positive influences in their choice processes as compared to non-URM matriculants.

Finally, URM matriculants were more likely to report that they decided to pursue the PA profession later in their educational careers than non-URM matriculants. All of these findings support previous theories and models, including Bourdieu's theory of habitus (Bourdieu & Passeron, 1977), Perna's contextual model of influences on URM choice process when considering graduate school (2006), and Hadinger's Conceptual Model of Minorities in Medical School Admissions (2017) which suggested that URM medical students experienced unique influences on their choice process when considering medical school.

The findings of this study lay groundwork for PA programs and professional organizations trying to understand the choice process of URM applicants and matriculants, to impact the development of strategies to increase the diversity of the PA profession. Looking at the applicant and matriculant data through the lens of the anti-deficit achievement theory (Harper, 2010), it appears that many successful PA school applicants and matriculants decide to pursue the profession later in their educational careers, suggesting that this can be useful pathway to the PA profession. Additionally, successful URM PA school applicants and matriculants reported learning about the profession from a variety of information sources, including professional experiences, academic experiences, media and fairs, and PA profession resources. Results suggest that investment in all of these types of resources can be beneficial when recruiting URM PA students. It also demonstrates that URM applicants are open to influences from a variety of sources. Further research into each of the dependent relationships identified in this study, to better understand causality and intervention strategies would be helpful to provide more practical guidance for PA programs and organizations.

Limitations

When considering the results and discussion of this study, some limitations should be considered. These limitations include response bias, bias of the researcher, confounding factors, and population limitations.

Response Bias. The data used for this study was limited by which individuals elected to complete optional survey items on CASPA and the MSS. Of the 26,768 CASPA applicants in the 2016-2017 cycle, 79.5% were eligible for inclusion in analysis for question one and 76.7% were eligible for inclusion in analysis for question two, based on completion of both the race and ethnicity items as well as the items related to the research questions. For the MSS, an estimated 42.1% of all matriculating PA students completed the MSS, and of those participants, 97.0% were eligible for inclusion for question three, and 96.0-96.8% were eligible for inclusion in the analyses of the various parts for question four. Self-selection bias may have led to a study population that is inherently more positive or negative toward the PA profession or the influences that were included in the surveys. The data and conclusions may have been different had there been a 100% response rate from applicants and/or matriculants to PA school.

Researcher Bias. The researcher for this study does not belong to a URM racial or ethnic group, and approached the study design through the lens of a non-URM PA. Literature produced by URM researchers and medical professionals was used to provide a theoretical framework and background to the study, but the study design and data interpretation may have been impacted by the experiences of the researcher.

Confounding Factors. Another limitation of the findings from this study was the potential for confounding factors affecting outcomes. Examining the choice process of an

entire demographic of students is complicated, and a multitude of factors may influence an individual's choice to pursue a given profession. This study attempted to look for trends in the choice processes of PA school applicants and matriculants, but the author recognizes that there can be significant variation among individuals. Additional analysis controlling for confounding factors could be performed to better understand the impact on study outcomes.

Population limitations. This study compared URM participants as a single group against non-URM participants, which limits understanding of each individual URM racial or ethnic group. Just as study respondents had complicated combinations of factors that influenced their individual choice process, unique influences and factors affect sub-groups within the larger groups of URM and non-URM applicants and matriculants. Currently, the number of individuals in each separate URM racial or ethnic group are too small to analyze against the larger group of non-URM participants. If the proportion of URM applicants and matriculants increases in the future, it may be possible to look for factors that uniquely affect individual racial, ethnic, or cultural groups as they consider the PA profession.

Recommendations

The data from this study provides a foundation for understanding the choice process of PA school applicants and matriculants, particularly how the choice process may be different for URM applicants and matriculants. Based on the findings of this study, the following recommendations are provided:

- Additional research on new populations to determine the impact of negative influences on prospective applicants to PA school would improve the understanding of choice process.
- Qualitative analysis of the relationships identified between URM status and the choice processes of individuals would be a useful to better understand dependent relationships that were identified in this study.
- Further research is needed to understand the opportunities for and experiences of URM employees and volunteers in the healthcare setting, which may clarify the results from this study suggesting that URM matriculants were more likely to say that healthcare experience was absent, and less likely to say that it was a positive influence than non-URM matriculants.
- Additional research is needed to identify current and potential best practices for recruiting applicants, including applicants who are farther in their educational journey, including graduates of associate's and bachelor's programs.
- Additional research into the impact of having a pre-professional phase would have on the diversity of a PA program, and strategies that might help with intentional recruitment of URM PA applicants to these programs.
- Additional analysis of CASPA and MSS data to control for confounding factors to better understand the impact.
- If the proportion of URM applicants and matriculants increases in the future, representation of sub-groups within current racial and ethnic classifications

may be large enough to investigate factors that uniquely impact more specific racial and ethnic groups.

Concluding Comments

This study expands current understanding of how and when PA school applicants and matriculants decided to pursue the PA profession. The results of this study provide PA programs, professional organizations, medical clinics and systems, and individual medical providers with a better understanding of the current factors that impact the choice process of URM PA school applicants and matriculants. As the demographics of the population of the United States changes, the need for URM PAs will continue to grow. Understanding choice process and using that information to increase the diversity of the PA profession will be imperative to address the needs of the larger healthcare system in the future.

References

Agrawal, J.R., Vlaicu, S., & Carrasquillo, O. (2005). Progress and pitfalls in underrepresented minority recruitment: perspectives from the medical schools. *Journal of the National Medical Association 97*(9): 1226-31.

Alexander, C., Chen, E., & Grumbach, K. (2009). How leaky is the health career pipeline? Minority student achievement in college gateway courses. *Academic Medicine 84*(6): 797-802. doi: 10.1097/ACM.0b013e3181a3d948

American Academy of Physician Assistants [AAPA]. (2014). *Attitudes Toward Physician Assistants: A 2014 Survey by the American Academy of Physician Assistants*. Retrieved from https://www.aapa.org/wp-content/uploads/2017/01/AAPA-HarrisSurvey-Methodology-and-Tables.pdf

AAPA. (2017). *The PA pipeline to practice: PA workforce 2017 – an update*. Retrieved from http://paeaonline.org/research/the-pa- pipeline-to-practice-data-from-paea-nccpa-and-aapa/

AAPA. (2018a). *About AAPA*. Retrieved from https://www.aapa.org/about/

AAPA. (2018b). *How are PAs educated and trained?.* Retrieved from https://www.aapa.org/what-is-a-pa/#tabs-2-how-are-pas-educated-and-trained

AAPA. (2018c). *What is a PA?.* Retrieved from https://www.aapa.org/what-is-a-pa/

Association of American Medical Colleges [AAMC]. (2018). *Underrepresented in medicine definition*. Retrieved from https://www.aamc.org/initiatives/urm

AAMC. (2016). *The complexities of physician supply and demand: projections from 2014 to 2025*. Retrieved from https://www.aamc.org/download/458082/data/2016_complexities_of_supply_and_demand_projections.pdf

AAMC. (2018). *2018 Update: the complexities of physician supply and demand: projections from 2016 to 2030*. Retrieved from https://aamc-black.global.ssl.fastly.net/ production/media/filer_public/85/d7/85d7b689-f417-4ef0-97fbecc129836829/aamc_2018_workforce_projections_update_ april_11_2018.pdf

Ballejos, M.P., Rhyne, R.L., & Parkes, J. (2015). Increasing the relative weight of noncognitive admission criteria improves underrepresented minority admission rates to medical school. *Teaching and Learning in Medicine 27*(2):155-62. doi: 10.1080/10401334.2015.1011649.

Bearder, A., Carter, M., & Harve, A. (2013). The three "E's" of healthcare consumerism: empathy, engagement, empowerment. *Managed Care Outlook, 26*(23), 1-9. Retrieved from http://search.proquest.com/docview/1465226294?accountid=8593

Bourdieu, P., & Passeron, J. C. (1977). *Reproduction in education, society, and culture*. Beverly Hills, CA: Sage Publications.

Centralized Application Service for Physician Assistants [CASPA]. (2017a). 2013-2016 Cycles matriculant comparison report. Retrieved from http://paeaonline.org/caspa/program-resources/

CASPA. (2017b). *2015-2017 Cycles applicant comparison report*. Retrieved from http://paeaonline.org/caspa/program-resources/

CASPA. (2017c). *CASPA 2017-2018 Manual*. Retrieved from http://paeaonline.org/caspa/program-resources/

CASPA. (2017d). *The PA pipeline to practice: applicant and matriculant data from CASPA*. Retrieved from http://paeaonline.org/research/the-pa-pipeline-to-practice-data-from-paea-nccpa-and-aapa/

CASPA. (2018). *Welcome to CASPA*. Retrieved from https://caspa.liaisoncas.com/applicant-ux/#/login

Cipher, D.J., Hooker, R.S., Sekscenski, E. (2006). Are older patients satisfied with physician assistants and nurse practitioners? *Journal of the American Academy of Physician Assistants 19*(1):36, 39-40, 42-44.

Colby, S. & Ortman, J. (2015) *Projections of the size and composition of the US population: 2014-2060*. Retrieved from https://www.census.gov/content/dam/Census/library/publications/2015/demo/p25-1143.pdf

Cooper, L., Roter, D., Johnson, R., Ford, D., Steinwachs, D., & Powe, N. (2003). Patient centered communication, ratings of care, and concordance of patient and physician race. *Annals of Internal Medicine, 139*(11), 907-15.

Coplan, B., Bautista, T.G., & Dehn, R.W. (2018). PA program characteristics and diversity in the profession. *Journal of the American Academy of Physician Assistants*, *31*(3):38-46. doi: 10.1097/01.JAA.0000530295.15656.51.

Coplan, B., Cawley, J., & Stoehr, J. (2013). Physician assistants in primary care: trends and characteristics. *Annals of Family Medicine, ll*(l):75-79.

Denu, R.A., Hampton, J.M., Currey, A., Anderson, R.T., Cress, R.D., Fleming, S.T., Lipscomb, J., Sabatino, S.A., Wu, X., Wilson, J.F., Trentham-Dietz, A. (2016). Influence of patient, physician, and hospital characteristics on the receipt of guideline-concordant care for inflammatory breast cancer. *Cancer Epidemiology*, *40*:7-14.

DiBaise, M., Salisbury, H., Hertelendy, A., & Muma, RD. (2015). Strategies and perceived barriers to recruitment of underrepresented minority students in physician assistant programs. *Journal of Physician Assistant Education 26*(1): 19-27. doi: 10.1097/JPA.0000000000000005

Edgerton, J.D., & Roberts, L.W. (2014). Cultural capital or habitus? Bourdieu and beyond in the explanation of enduring educational inequality. *Theory and Research in Education, 12*(2): 193-220.

Eskes, C., Salisbury, H., Johannsson, M., & Chene, Y. (2013). Patient satisfaction with language--concordant care. *The Journal of Physician Assistant Education, 24*(3), 14-22.

Everett, C.M., Schumacher, J.R., Wright, A., & Smith, M.A. (2009). Physician assistants and nurse practitioners as a usual source of care. *Journal of Rural Health, 25(*4): 407-414.

Felix, H., Laird, J., Ennulat, C., Donkers, K., Garrubba, C., Hawkins, S., & Hertweck, M. (2012). Holistic admissions process: an initiative to support diversity in medical education. *Journal of Physician Assistant Education, 23*(3): 21-7.

Fiscella, K., Meldrum, S., Franks, P., Shields, C. G., Duberstein, P., McDaniel, S. H., & Epstein, R. M. (2004). Patient trust: Is it related to patient-centered behavior of primary care physicians? *Medical Care, 42*(11), 1049-1055. doi:10.1097/00005650-200411000-00003

Fisher v. University of Texas at Austin et al., 579 U.S. ___ (2016). Retrieved from https://www.supremecourt.gov/opinions/15pdf/14-981_4g15.pdf

Freeman, B.K., Landry, A., Trevino, R., Grande, D., & Shea, J.A. (2016). Understanding the leaky pipeline: perceived barriers to pursuing a career in medicine or dentistry among underrepresented-in-medicine undergraduate students. *Academic Medicine 91*(7): 987-93. doi: 10.1097/ACM.0000000000001020

Giordani, B., Edwards, A.S., Segal, S.S., Gillum, L.H., Lindsay, A., & Johnson, N. (2001). Effectiveness of a formal post-baccalaureate pre-medicine program for underrepresented minority students. *Academic Medicine 76*(8): 844-8.

Grumbach, K., & Chen, E. (2006). Effectiveness of university of California postbaccalaureate premedical programs in increasing medical school matriculation for minority and disadvantaged students. *JAMA, 296*(9), 1079-1085.

Hadinger, M. A. (2017). Underrepresented minorities in medical school admissions: A qualitative study. *Teaching and Learning in Medicine, 29*(1), 31-41. doi:10.1080/10401334.2016.1220861

Harper, S. R. (2010). An anti-deficit achievement framework for research on students of color in STEM. In S. R. Harper & C. B. Newman (Eds.), *Students of color in STEM: Engineering a new research agenda. New Directions for Institutional Research* (pp. 63-74). San Francisco: Jossey-Bass.

Hauch, A., Al-Qurayshi, Z., Friedlander, P., Kandil, E. (2014). Association of socioeconomic status, race, and ethnicity with outcomes of patients undergoing thyroid surgery. *JAMA Otolaryngology - Head and Neck Surgery 140*(12):1173–1183. doi:10.1001/jamaoto.2014.1745

Health Resources & Services Administration [HRSA]. (2016). *Medically underserved areas and populations*. Retrieved from https://bhw.hrsa.gov/shortage-designation/muap

HRSA. (2018). Health career opportunity program: the national HCOP academies. Retrieved from https://bhw.hrsa.gov/fundingopportunities/default.aspx?id=9b288889-b486-4e9d-a02a-2dd9d80a9ccc

Higgins, R. J., Moser, S., Dereczyk, A., Canales, R., Stewart, G., Ruback, T., Schierholtz, C., McDaniel, J., Van Rhee, J., Arbuckle, S. (2010). Admission variables as predictors of PANCE scores in physician assistant programs: A comparison study across universities. *Journal of Physician Assistant Education, 21*(1), 10-17.

Hocking, J., & Piepenbrock, K. (2010). Predictive ability of the graduate record examination and its usage across physician assistant programs. *The Journal of Physician Assistant Education 21*(4), 18-22.

Hooker, R., & Muchow, A. (2014). Supply of physician assistants: 2013-2026. *Journal of the American Academy of Physician Assistants 27*(3), 39-45. doi: 10.1097/01.JAA.0000443969.69352.4a

Hossler, D., & Gallagher, K. S. (1987). Studying college choice: A three-phase model and the implications for policy-makers. *College and University, 2*: 207-221.

Institute of Medicine [IOM]. (2004). In the nation's compelling interest: ensuring diversity in the health-care workforce [Report]. Retrieved from https://www.ncbi.nlm.nih.gov/ books/NBK216009/

John, O., Naumann, L. P., & Soto, C. J. (2008). Paradigm shift to the integrative big-five trait taxonomy: History, measurement, and conceptual issues. In O. P. John, R. W. Robins, & A. Pervin (eds.), handbook of personality: Theory and research (pp. 114-158). New York, NY: Guilford Press.

Jones, P.E., Simpkins, S., & Hocking, J.A. (2014). Imperfect physician assistant and physical therapist admissions processes in the United States. *Journal of Educational Evaluation for Health Professions, 11*:11.

King, W.D., Wong, M.D., Shapiro, M.F., Landon, B.E., & Cunningham, W.E. (2004). Does racial concordance between HIV-positive patients and their physicians affect the time to receipt of protease inhibitors? *Journal of General Internal Medicine, 19*(11): 1146-1153.

Klingler, G., Kaylor, M., Johannsson, M., & Schaat, B. (2014). Factors influencing physician assistant program choice among pre-physician assistant students. *The Journal of Physician Assistant Education 25*(3), 26-30.

Komaromy, M., Grumbach, K., Drake, M., Vranizan, K., Lurie, N., Keane, D., & Bindman, A.B. (1996). The role of black and Hispanic physicians in providing health care for underserved populations. *New England Journal of Medicine, 334*(20): 1305-1310.

Laveist, T., Nuru-Jeter, A, & Jones, K.E. (2003). The association of doctor-patient race concordance with health services utilization. *Journal of Public Health Policy, 24*(3): 312-323.

Liaison. (2017). *Centralized Application Service*. Retrieved from https://www.liaisonedu.com/centralized-application-service/

Lebrun, L.A., & Shi, L. (2011). Nativity status and access to care in Canada and the US: Factoring in the roles of race/ethnicity and socioeconomic status. *Journal of Health Care for the Poor and Underserved, 22*(3), 1075-1100.

Magnani, J.W., Norby, F.L., Agarwal, S.K., Soliman, E.Z., Chen, L.Y., Loehr, L.R., & Alonso, A. (2016). Racial differences in atrial fibrillation-related cardiovascular disease and mortality: the atherosclerosis risk in communities (ARIC) study. *JAMA Cardiology, 1*(4):433–441. doi:10.1001/jamacardio.2016.1025

McDaniel, A., Thrasher, T., & Hiatt, T. (2013). The use of noncognitive factors in physician assistant admissions. *Journal of Physician Assistant Education, 24*(1), 15-23.

HcHugh, M.L. (2013). The chi-square test of independence. *Biochemical Medicine 23*(2):143-9. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/23894860

Muma, R.D., Kelley, J., & Lies, S. (2010). Relationships of demographic back ground and practice setting among practicing physician assistants in the United States. *Journal of Physician Assist Education 21*(2):15-21.

Nilson, W.A. (2016). *Big five personality traits and other predictors of academic success in physician assistant studies* (Unpublished doctoral dissertation). Bethel University, St. Paul, MN.

NPR, Robert Wood Johnson Foundation, & Harvard T.H. Chan School of Public Health (2017). *Discrimination in america: experiences and views of african americans*. Retrieved from https://www.rwjf.org/content/dam/farm /reports/reports/2017/rwjf441128

PA History Society. (2017). *Timeline*. Retrieved from https://pahx.org/timeline/

Paulsen, M. B., & St. John, E. P. (2002). Social class and college costs: Examining the financial nexus between college choice and persistence. *Journal of Higher Education, 73*(2), 189-236. doi:10.1353/jhe.2002.0023

Paulsen, M. (2014). Higher education: handbook of theory and research: volume 29. Springer: New York.

Perna, L. W. (2004). Understanding the decision to enroll in graduate school: Sex and Racial/Ethnic group differences. *The Journal of Higher Education, 75*(5), pp. 487- 527.

Perna, L. W. (2006). Studying college access and choice: A proposed conceptual model. In J. C. Smart (Ed.), *Higher education: Handbook of theory and research* (pp. 99-157). The Netherlands: Springer.

Physician Assistant Education Association [PAEA]. (2017a). *2017-2018 PAEA Advocacy Agenda*. Retrieved from http://paeaonline.org/advocacy/advocacy-agenda/

PAEA. (2017b). By the Numbers: Student Report 1. Washington, DC: PAEA. doi: 10.17538/SR2017.0001

PAEA. (2017c). *PAEA's diversity and inclusion initiatives: a status report*. Retrieved from http://paeaonline.org/?s=DIMAC

PAEA. (2017d). Program Report 32: Data from the 2016 Program Survey. Retrieved from https://paeaonline.org/wp-content/uploads/2018/08/ProgramReport32_2017_3.pdf. doi: 10.17538/PR32.2017

PAEA. (2018a). *2016 Matriculating Student Survey*. Retrieved from http://paeaonline.org/research/survey-instruments/

PAEA. (2018b). *About PAEA*. Retrieved from http://paeaonline.org/about-paea/

PAEA. (2018c). *By the Numbers: Student Report 2: Data from the 2017 Matriculating Student and End of Program Surveys*. Retrieved from https://paeaonline.org/wp-content/uploads/2018/07/student-report2-20180717.pdf. doi: 10.17538/SR2018.0002

PAEA. (2018d). *PAEA data request and sharing policies*. Retrieved from http://paeaonline.org/research/paea-data-request/

PAEA. (2018f). Project access toolkit. Retrieved from https://paeaonline.org/project-access-toolkit/

Rabinowitz, H.K., Diamond, J.J., Veloski, J.J., & Gayle, J.A. (2000). The impact of multiple predictors on generalist physicians' care of underserved populations. *American Journal of Public Health, 90*(8): 1225-1228.

Saha, S., Guiton, G., Wimmers, P.F., Wilkerson, L. (2008). Student body racial and ethnic composition and diversity-related outcomes in US medical schools. *JAMA 300*(10):1135-1145. doi:10.1001/jama.300.10.1135

Sargen, M., Hooker, R.S., & Cooper, R.A. (2011). Gaps in the supply of physicians, advance practice nurses, and physician assistants. *Journal of the American College of Surgeons. 212*(6): 991-999.

Snyder, C.R., Stover, B., Skillman, S.M., & Frogner, B.K. (2015). Facilitating racial and ethnic diversity in the health workforce. *University of Washington Center for Health Workforce Studies [Report]*. Retrieved from http://depts.washington.edu/uwrhrc/uploads/FINALREPORT_Facilitating%20Diversity%20in%20the%20Health%20Workforce_7.8.2015.pdf

Staton, F.S., Bhosle, M.J., Camacho, F.T., Feldman, S.R., & Balkrishnan, R. (2007). How PAs improve access to care for the underserved. Journal of the American Academy of Physician Assistants, 20(6): 32-40.

St. John, E. P., & Asker, E. H. (2001). The role of finances in student choice: A review of sex and racial/ethnic group differences. In M. B. Paulsen, & J. C. Smart (Eds.), *The finance of higher education: Theory, research, policy, and practice* (pp. 419-438). New York, NY: Agathon Press.

Strayhorn G., & Demby K. (1999). Do pre-admission programs make a difference in the enrollment of underrepresented-minority students at U.S. medical schools? *Academic Medicine 74*(4): 431-4.

Street, R.L., O'Malley, K.J., Cooper, L.A., & Haidet, P. (2008). Understanding concordance in patient-physician relationships: personal and ethnic dimensions of shared identity. *Annals of Family Medicine, 6*(3), 198-205. doi: 10.1370/afm.821

Summer Health Professions Education Program. *About*. Retrieved from http://www.shpep.org/about/

Traylor, A.H., Schmittdiel, J.A., Uratsu, C.S., Mangione, C.M., & Subramanian, U. (2010). Adherence to cardiovascular disease medications: does patient-provider race/ethnicity and language concordance matter? *Journal of General Internal Medicine, 25*(11): 1172-7. DOI: 10.1007/s11606-010-1424-8

United States Census Bureau. (2017). *Quick Facts*. Retrieved from https://www.census.gov/quickfacts/fact/table/US/PST045217#

United States Department of Health & Human Services [HHS]. (1979). *The Belmont Report* [Report]. Retrieved from http:// www.hhs.gov/ohrp/humansubjects/guidance/belmont.html

United States Department of Health & Human Services. (2015). *2015 National Healthcare Quality and Disparities Report*. Retrieved from https://www.ahrq.gov/research/findings/nhqrdr/nhqdr15/index.html

United States Department of Labor, Bureau of Labor Statistics. (2016). Occupational handbook: physician assistant. Retrieved from https://www.bls.gov/ooh/healthcare/physician-assistants.htm

Appendix A

Copy of CASPA and MSS Survey Items Utilized for this Study

Copy of CASPA and MSS Survey Items Utilized for this Study

CASPA Applicant Data

1. How did you first hear about the PA profession?
   - Parent
   - Another friend/relative
   - Personal healthcare provider for me or my family
   - Teacher or professor
   - Health professions advisor
   - Health related work experience
   - Book/article/film/television
   - PAEA or AAPA literature
   - PA program literature or faculty
   - Career or Guidance counselor
   - Career-Eco Virtual Fair
   - PA Focus
   - Project Access
   - HCOP/Health Career Opportunity Programs

2. What was the most influential factor in bringing you to the PA profession/PA Education?
   - Parent
   - Another friend/relative
   - Personal healthcare provider for me or my family
   - Teacher or professor
   - Health professions advisor
   - Health related work experience
   - Book/article/film/television
   - PAEA or AAPA literature
   - PA program literature or faculty
   - Career or Guidance counselor
   - Career-Eco Virtual Fair
   - PA Focus
   - Project Access
   - HCOP/Health Career Opportunity Programs

Matriculating Student Survey

15. What is your race? Please check as many as apply.

- ❑ American Indian or Alaskan Native
- ❑ Asian
- ❑ Black or African American
- ❑ Native Hawaiian or other Pacific Islander
- ❑ White or European American
- ❑ I prefer not to answer
- ❑ Other, please specify: _____

16. Are you Hispanic, Latino, or Spanish in origin?

- ❍ Yes
- ❍ No
- ❍ I prefer not to answer

31. When did you decide to become a PA?

- ❍ Before high school
- ❍ During high school/before college
- ❍ During the first two years of college
- ❍ After receiving an associate's degree
- ❍ During junior year of college
- ❍ During senior year of college
- ❍ After receiving a bachelor's degree
- ❍ After receiving an advanced degree

38. Please indicate how the following factors influenced your decision to become a PA.

	Did not use/have not heard of	Made me NOT WANT to become a PA	No influence on my decision to become a PA	Made me WANT to become a PA
AAPA website/literature	❍	❍	❍	❍
PAEA website/literature	❍	❍	❍	❍
PA program literature	❍	❍	❍	❍
College/campus admissions department	❍	❍	❍	❍
Public media (e.g., television, newspaper, radio)	❍	❍	❍	❍
Social media (e.g., YouTube, Facebook)	❍	❍	❍	❍
Project Access	❍	❍	❍	❍
Previous healthcare experience	❍	❍	❍	❍
Previous military experience	❍	❍	❍	❍
PA program faculty/staff	❍	❍	❍	❍
Friend	❍	❍	❍	❍
Family member	❍	❍	❍	❍
Career counselor/teacher (high school or college)	❍	❍	❍	❍
Physician who treated me/my family	❍	❍	❍	❍
Other physician acquaintance	❍	❍	❍	❍
PA who treated me/my family	❍	❍	❍	❍
Other PA acquaintance	❍	❍	❍	❍
Other health professional	❍	❍	❍	❍
Other, please specify	❍	❍	❍	❍

Appendix B

CASPA Release, Privacy, and Data Policies

CASPA Release, Privacy, and Data Policies

CASPA will only discuss an application with the applicant and the applicant's designated PA programs. Staff will not discuss an application with a parent, spouse, relative, friend, or employer.

Release Statement
To complete the CASPA application process, applicants are requested to electronically sign and certify the following statement: 'by accepting these terms, I certify, as required in the application, that I have read, understand, and agree to all policies found within the Instructions & FAQ and the CASPA Admissions Code of Cooperation, including the provisions that place responsibility for monitoring and ensuring the progress of my application process with me. I certify that all the information and statements I have provided as part of this application process, including those statements contained in the application and as part of the evaluation verification process are current, accurate, and complete to the best of my knowledge. I understand that withholding information requested as part of the application process, or submitting false or misleading information may be grounds for denial of admissions by any participating program or expulsion from said program after admission.'

Advisor Release
CASPA asks its applicants to authorize the following release of information to the appropriate pre-health professions advisors. The authorization reads 'by answering yes, you authorize CASPA to release selected information regarding your CASPA application and admission status to the health professions advisor and the health professions advisory committee of the post-secondary institution(s) that you have attended. By releasing your information, your advisor is better able to assist you in all admissions process, as well as better guide other students in the future. You cannot make changes to this item after you submit your application to CASPA. Check to authorize to release your application's academic information and admission status to designated health professions advisors at the schools you have previously attended. Your personal and financial information will remain confidential at all times; and your personal statement or disciplinary actions listed on your application will not be viewable. Advisors may use this information to help benchmark acceptance rates from their programs and improve their interactions with future applicants.'

CASPA Professional Code of Conduct
CASPA asks its applicants to agree to the professional code of conduct: 'by clicking, 'I Accept', I certify that I have read, understand, and agree to abide by the CASPA Professional Code of Conduct. I understand that misconduct, as defined by this code, may subject me to sanctions by the Physician Assistant Education Association. Furthermore, I understand that these sanctions may include, but are not limited to, losing the privilege of applying to or entering the physician assistant profession.'

Privacy Policy
All data gathered at the close of each cycle become the property of PAEA. Data gathered by CASPA are classified as restricted. Restricted data are reported only in aggregate form so as not to divulge student-specific demographic information. Student data are reported in aggregate only. To maintain confidentiality, it is PAEA's policy to not report any average unless more than four values are used to calculate that average.

Data Collection, Processing, and Dissemination
CASPA has developed policies to prevent the exposure of truly confidential personal data without the permission of the individual involved, to limit the distribution of sensitive data to those situations that require it, and to permit distribution of nonsensitive directory information wherever a useful purpose can be served. Except for directory information and communications with the programs as a part of the application and record-keeping process, information about individual students is not shared with anyone in a way that would permit individual identification. Applicant data transmitted to the PA Data Consortium for research purposes may contain identifying information to allow initial matching of records, but all records will be de-identified as soon as possible and only aggregated data will be reported. Any personally identifiable data submitted by an applicant will be made available to that applicant upon written request. Information about applicants and students is disclosed to the colleges and programs to which a student applies and/or matriculates. Except for monitoring reports related to matriculants, information submitted to CASPA by a PA program or school is available only to that institution.

Data Reporting
The PA program understands that aggregate applicant data is the only data that may be reported externally by CASPA. For research purposes, PAEA may share applicant data with the Physician Assistant Data Consortium [which consists of PAEA, the American Academy of Physician Assistants (AAPA), and the National Commission on Certification of Physician Assistants (NCCPA), subject to confidentiality agreements from the consortium members and to the requirement that only aggregated data may be reported externally. Member programs are expected to continue to monitor their admissions policies and practices in accordance with their educational and training institutions fair practice policies.

Appendix C

PAEA Informed Consent for Participation in MSS

PAEA Informed Consent for Participation in MSS

Important Information About the PAEA Matriculating Student Survey: Please Read Carefully

The Physician Assistant Education Association (PAEA) is the national organization that represents physician assistant (PA) programs and advocates on behalf of students, faculty, and educational programs. PAEA administers the Matriculating Student Survey (MSS) annually to all incoming first-year PA students. The MSS seeks information from entering PA students to improve education, recruitment, and retention. The survey will take approximately 20 to 25 minutes to complete. Students who complete the survey will have the opportunity to enter into a prize drawing. Questions on the MSS cover topics such as:

- Demographic information
- Academic and employment background
- Factors related to your choice of the PA profession and your PA program
- Educational financing
- Intended specialty and practice environments
- Health and well-being

Incentives

Respondents who complete the survey will have the opportunity to enter into a drawing for one of four $25 Amazon gift cards. PAEA will enter each PA program with at least an 80% response rate into a drawing for a $250 gift card that can be used to help sponsor a pizza party or other event decided by your class. Additionally, each PA program with at least an 80% response rate will be entered into a drawing for a free 2018 PAEA Education Forum registration.

Participation is Voluntary

Participation in this survey is completely confidential and voluntary. You have the right to not answer any questions you choose. There is no penalty for not completing the survey or for discontinuing it. You may withdraw at any time by simply closing the survey. Although you may skip any questions you do not feel comfortable answering, providing honest and complete information helps improve the reliability and validity of these important data. If you believe you are being coerced into participation, please contact PAEA research staff (research@PAEAonline.org).

Confidentiality Statement

The data collected in this survey are classified as confidential. You will be asked to provide your email address so that PAEA can identify duplicate responses, but it will not be stored with your answers. Once this survey closes and duplicate responses are resolved, and incentive drawing participants are contacted, email addresses will be permanently removed from the dataset to ensure confidentiality. PAEA will ask for permission to retain your email address in a password-protected file kept separate from your responses for the purpose of inviting you to follow-up studies. Your email address

and responses will never be released to your program or any other entity under any circumstances.

Individually identifying data are never released. The responses you provide on this survey are retained by PAEA in a secure database which may only be accessed by a small number of designated PAEA research staff trained in human subjects protections and confidentiality procedures. Physician assistant programs receive data in reports that aggregate responses at the national levels. On occasion, for the purpose of conducting further studies, researchers may request a de-identified (i.e., all identifying information is stripped from anonymous responses) file of individual-level data. PAEA reduces the probability of connecting responses to specific individuals by not providing information where the small number of respondents in a specific category could potentially allow individuals to be reasonably identified. Researchers requesting de-identified files will be required to agree to terms that outline how the data may be used and for how long. This data collection activity has been reviewed according to PAEA policies and procedures and its Institutional Review Board and is considered to be minimal risk. PAEA has taken extensive measures to ensure the security of the data and the confidentiality of the responses. We believe that there are no anticipated risks or discomforts associated with taking this survey. PAEA does not use survey data for marketing purposes.

If you have any questions about your rights as a participant or experience technical difficulties while completing the survey, please contact PAEA research staff (research@PAEAonline.org; 703-667-4335).

Thank you for participating and welcome to PA School!

PAEA Research Staff

By checking the button below and beginning the survey, you acknowledge that you have read the preceding information and freely consent to participate in this research.

❍ I have read and understood this disclosure and agree to participate in the survey
❍ I have read and understood this disclosure and choose not to participate in the survey

Collecting student data at multiple time-points is critical to understanding the real impact of PA education. Having such rich information helps programs understand which aspects of PA education are working and which need to be changed. PAEA government relations staff also use these data to advocate for policies that benefit PA programs and students, such as debt-forgiveness and funding. PAEA may invite you to participate in future surveys unless you check the box below. By giving permission to PAEA to contact you in the future you are NOT signing up to participate in any studies; you are simply giving PAEA permission to inform you of opportunities to take surveys. Your contact information will remain private and confidential and will not be stored with your responses. Incentive prizes will increase in longitudinal surveys. Please only check the box below if PAEA may not inform you of future survey opportunities. Otherwise, if you consent to be informed of future survey opportunities please hit 'Continue'.

❑ PAEA may not contact me for follow-up surveys

Important Note

Your responses will automatically save as you progress through the survey. If you close your survey before you finish, you may pick up where you left off if you use the same device and the same browser. Please contact PAEA research staff (research@PAEAonline.org) at any time if you have any questions or experience any technical difficulties. Thank you for participating!

Appendix D

Complete Listing of Items Included on MSS

Complete Listing of Items Included on MSS

1. Did you start your current PA program less than three months ago?
❍ Yes
❍ No

1a. Will you be starting your PA program within the next month?
❍ Yes
❍ No

2. Please enter and confirm your email address from your PA program's institution (typically ends in '.edu'). Note: Your email is considered private and confidential. It will be erased after we identify duplicate responses and notify winners of the incentive drawing. If you gave PAEA permission to inform you of future survey participation opportunities, your email will be stored in a password-protected database that is separate from your responses.
Email Address
Re-Enter Email Address

3. Please select the state in which your program is located from the drop-down list below.

4. Please select your program from the drop-down list below.Note: Several programs have similar names; please make sure that you select the correct one.
❍

4a. Are you enrolled at a distant or satellite campus?
❍ Yes
❍ No

4b. Please provide the full name of the distant or satellite campus you are enrolled in.

5. Did you complete an application on CASPA, the Central Application System for PA programs?
❍ Yes
❍ No

6. Did you first enroll in your PA program as an undergraduate student (e.g., participated in a pre-professional program or track prior to enrolling as a graduate student)?
❍ Yes
❍ No
❍ Other, please specify: _____

6a. In what year did you enter the pre-professional program or track?
❍ 2005
❍ 2006
❍ 2007
❍ 2008
❍ 2009
❍ 2010
❍ 2011
❍ 2012
❍ 2013
❍ 2014
❍ 2015
❍ 2016
❍ Other, please specify: _____

7. In what year did you enter (or expect to enter if you are in orientation now) the official PA program?
❍ 2017
❍ Other, please specify: _____

8. In what month did you enter (or expect to enter if you are in orientation now) the official PA program?
❍ January
❍ February
❍ March
❍ April
❍ May
❍ June
❍ July
❍ August
❍ September
❍ October
❍ November
❍ December

9. In what year do you expect to graduate from your PA program?
❍ 2017
❍ 2018
❍ 2019
❍ 2020
❍ 2021

10. In what month do you expect to graduate from your PA program?
❍ January
❍ February
❍ March
❍ April
❍ May
❍ June
❍ July
❍ August
❍ September
❍ October
❍ November
❍ December

11. Please enter your age at the time you entered the professional phase of your PA program.

You, Your Health, and Well-Being

Why do we collect this information?

12. How do you self-identify?
❍ Male
❍ Female
❍ Transgender
❍ Non-binary: Do not exclusively identify as male or female
❍ I prefer not to answer

13. In which country were you born?

13a. How old were you when you moved to the United States?

14. Were your parents born in the United States?

	Yes	No	Don't Know	Prefer not to answer
Parent 1	❍	❍	❍	❍
Parent 2	❍	❍	❍	❍

15. What is your race? Please check as many as apply.
- ❑ American Indian or Alaskan Native
- ❑ Asian
- ❑ Black or African American
- ❑ Native Hawaiian or other Pacific Islander
- ❑ White or European American
- ❑ I prefer not to answer
- ❑ Other, please specify: _____

15a. How do you self-identify? Please check as many as apply.
- ❑ Bangladeshi
- ❑ Cambodian
- ❑ Chinese
- ❑ Filipino
- ❑ Indian
- ❑ Indonesian
- ❑ Japanese
- ❑ Korean
- ❑ Laotian
- ❑ Pakistani
- ❑ Taiwanese
- ❑ Vietnamese
- ❑ Other Asian, please specify: _____

15b. How do you self-identify? Please check as many as apply.
- ❑ African
- ❑ African American
- ❑ Afro-Caribbean
- ❑ Other Black or African American, please specify: _____

15c. How do you self-identify? Please check as many as apply.
- ❑ Guamanian
- ❑ Native Hawaiian
- ❑ Samoan
- ❑ Tongan
- ❑ Other Pacific Islander, please specify: _____

16. Are you Hispanic, Latino, or Spanish in origin?
- ❍ Yes
- ❍ No
- ❍ I prefer not to answer

16a. How do you self-identify? Please check as many as apply.

- ❑ Argentinean
- ❑ Colombian
- ❑ Cuban
- ❑ Dominican
- ❑ Mexican, Mexican American, Chicano/Chicana
- ❑ Peruvian
- ❑ Puerto Rican
- ❑ Other Hispanic, Latino, or Spanish origin, please specify: _____

17. Are you Middle Eastern or Arabic in origin?

- ❍ Yes
- ❍ No
- ❍ I prefer not to answer

18. Approximately what percentage of your life have you spent in the following environments? Percentages must sum to 100%. If you prefer not to answer, please enter '100' in 'I prefer not to answer.'

_____ Inner city
_____ Rural
_____ Suburban
_____ Urban
_____ Outside the US
_____ Military base(s)
_____ Native American/American Indian reservation
_____ Other, please specify:
_____ I prefer not to answer

This section is based on the Association of American Medical Colleges (AAMC) Matriculating Student Questionnaire (MSQ).

19. Please select the number that best describes your feelings during the past week, including today. "0" represents "as bad as it can be" and "10" represents "as good as it can be."

	As bad as it can be 0	1	2	3	4	5	6	7	8	9	As good as it can be 10
Overall quality of life	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Overall mental well-being	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Overall physical well-being	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Overall emotional well-being	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Level of social activity	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Spiritual well-being	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

20. Please select the number that best describes your level of fatigue, on average, during the past 30 days. "0" represents "no fatigue" and "10" represents "constant tiredness."

	No fatigue 0	1	2	3	4	5	6	7	8	9	Constant tiredness 10
Level of fatigue	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

21. Please select the number that best describes your level of satisfaction with social support from friends and family during the past 30 days. "0" represents "not at all satisfied" and "10" represents "highly satisfied."

	Not at all satisfied 0	1	2	3	4	5	6	7	8	9	Highly satisfied 10
Level of social support from friends and family	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

22. Please select the number that best describes your financial concerns during the past 30 days. "0" represents "no concerns" and "10" represents "constant concerns."

	No concerns 0	1	2	3	4	5	6	7	8	9	Constant concerns 10
Financial concerns	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

23. Please indicate how often you felt or thought a certain way during the past 30 days.

	Never	Almost never	Sometimes	Fairly often	Very often
In the last month, how often have you felt that you were unable to control the important things in your life?	❍	❍	❍	❍	❍
In the last month, how often have you felt confident about your ability to handle your personal problems?	❍	❍	❍	❍	❍
In the last month, how often have you felt that things were going your way?	❍	❍	❍	❍	❍
In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	❍	❍	❍	❍	❍

24. Are you currently, or have you ever, served in the military?
- ❍ Yes
- ❍ No
- ❍ I prefer not to answer

25. What is your current military status?
- ❍ Veteran/commitment complete
- ❍ Regular military – active
- ❍ Regular military – inactive
- ❍ Reserve military – active
- ❍ Reserve military - inactive
- ❍ I prefer not to answer

26. In which of the following branches did you serve/do you currently serve? If you served in more than one branch, please select the branch in which you served the most time
- ❍ Air Force
- ❍ Army
- ❍ Coast Guard
- ❍ Marine Corps
- ❍ Navy
- ❍ Other, please specify: _____

27. How many years were you/have you been enlisted in active duty military service?

28. Did you receive healthcare related training/experience in the military?
- ❍ Yes
- ❍ No
- ❍ I prefer not to answer

28a. Which of the following describe your military healthcare experience? Please select all that apply.

- ❑ Dental
- ❑ General Duty Medic or Corpsman
- ❑ Healthcare Administration
- ❑ Medical Logistics
- ❑ Mental Health
- ❑ Nursing
- ❑ Nutrition Care
- ❑ Operating Room (e.g., surgical tech)
- ❑ Patient Administration
- ❑ Pharmacy
- ❑ Radiology
- ❑ Respiratory
- ❑ Other, please specify: _____
- ❑ I prefer not to answer

Your Education

29. Please indicate the highest level of education you completed prior to entering the professional phase of your PA program.

- ❍ High school diploma/GED
- ❍ Some college but no degree
- ❍ Associate's degree
- ❍ Bachelor of Arts
- ❍ Bachelor of Science
- ❍ Other Bachelor's degree (e.g., business, BFA)
- ❍ Master's degree (health- or natural sciences-related; e.g., MPH)
- ❍ Master's degree (not health- or natural-sciences related; e.g., MBA)
- ❍ Academic doctorate (health- or natural sciences-related; e.g., Biology PhD)
- ❍ Academic doctorate (not health- or natural sciences-related; e.g., EdD)
- ❍ Professional doctorate (health-related; e.g., MD)
- ❍ Professional doctorate (not health-related; e.g., JD)
- ❍ Foreign medical graduate/unlicensed medical graduate
- ❍ Other, please specify: _____
- ❍ I prefer not to answer

29a. For your bachelor's degree, in which primary discipline did you major? Please select the choice that best matches your major. Note: If you double-majored, you will be asked for your secondary major in the following question.

- ❍ Audiology/Speech-Language Pathology
- ❍ Biology (includes Anatomy, Physiology, Microbiology, and Zoology)
- ❍ Business
- ❍ Chemistry (includes Biochemistry)
- ❍ Exercise Science/Athletic Training
- ❍ Fine Arts (e.g., Performing or Visual Arts)
- ❍ Foreign Language (e.g., Spanish, French)
- ❍ General Studies
- ❍ Healthcare Administration
- ❍ Health Sciences
- ❍ Humanities (e.g., History, Philosophy)
- ❍ Kinesiology
- ❍ Mathematics
- ❍ Neuroscience
- ❍ Nursing
- ❍ Nutrition/Dietetics
- ❍ Physics
- ❍ Premedical Studies
- ❍ Psychology
- ❍ Public Health
- ❍ Social Sciences (e.g., Social Work, Anthropology)
- ❍ Other, please specify: _____
- ❍ Not applicable

29b. Did you complete a double major in your undergraduate education?

- ❍ Yes
- ❍ No

29c. For your bachelor's degree, in which secondary discipline did you major? Please select the choice that best matches your major.

- ❍ Audiology/Speech-Language Pathology
- ❍ Biology (includes Anatomy, Physiology, Microbiology, and Zoology)
- ❍ Business
- ❍ Chemistry (includes Biochemistry)
- ❍ Exercise Science/Athletic Training
- ❍ Fine Arts (e.g., Performing or Visual Arts)
- ❍ Foreign Language (e.g., Spanish, French)
- ❍ General Studies
- ❍ Healthcare Administration
- ❍ Health Sciences
- ❍ Humanities (e.g., History, Philosophy)
- ❍ Kinesiology
- ❍ Mathematics
- ❍ Neuroscience
- ❍ Nursing
- ❍ Nutrition/Dietetics
- ❍ Physics
- ❍ Premedical Studies
- ❍ Psychology
- ❍ Public Health
- ❍ Social Sciences (e.g., Social Work, Anthropology)
- ❍ Other, please specify: _____
- ❍ Not applicable

29d. What was your college/university undergraduate overall grade point average (GPA) at the time of your graduation? Note: Do not include cumulative GPA for additional college work done after graduation for prerequisites-requisites. Use a 4-point scale where an A = 4.0. If not applicable, please leave the space below blank.

29e. Approximately how many additional semester credits did you complete to only satisfy prerequisite requirements for the programs where you applied? Note: Please enter "0" if you did not take any additional credits to satisfy prerequisite requirements.

30. Please enter the five- or nine-digit code for the place you considered to be home or spent the majority of your life before college. Note: Please do not enter the zip code of the college or university attended while applying to your PA program—unless you grew up in that zip code in addition to attending college there.

Applying to PA School

31. When did you decide to become a PA?

- ❍ Before high school
- ❍ During high school/before college
- ❍ During the first two years of college
- ❍ After receiving an associate's degree
- ❍ During junior year of college
- ❍ During senior year of college
- ❍ After receiving a bachelor's degree
- ❍ After receiving an advanced degree

32. People choose to pursue a PA career for many reasons. Please drag all the reasons that made you choose to become a PA to the box and then rank them by importance, with "1" being the most important reason. You can rank as many reasons as you would like.

Reasons I chose to become a PA
_____ A "calling" to the healthcare profession
_____ Cost of education/affordability
_____ Desire to care for patients
_____ Desire to influence the direction of health care
_____ Excitement of health care
_____ Financial stability
_____ Length of education
_____ Level of education
_____ Mobility (geographically)
_____ Mobility within PA specialties
_____ Other health professions were less appealing
_____ Parental/peer pressure
_____ Prestige
_____ Relieving pain and suffering
_____ Work-life balance
_____ Other, please specify

33. In what year did you complete your most recent degree? Please enter the full, four-digit year (e.g., 2010).

- ❍ Year most recent degree was completed: _____
- ❍ Have not yet completed degree
- ❍ Moved from pre-professional phase directly to the professional phase of the program without completing a degree.

34. For the following statements regarding your application to PA programs for the current school year, please enter the appropriate number of programs:

	Number of programs
Submitted an application	
Granted an interview	
Received an acceptance letter	

35. Please estimate the total amount of money you spent applying to PA school, including fees and cost of interviews, for this year only. Note: Please do not include costs from campus visits that were not associated with an interview, other non-mandatory expenses (e.g., interview clothes), prerequisite coursework, or the cost of applying to PA school in previous years.

- ❍ No cost ($0)
- ❍ $1 to $499
- ❍ $500 to $999
- ❍ $1,000 to $1,499
- ❍ $1,500 to $1,999
- ❍ $2,000 to $2,499
- ❍ $2,500 to $2,999
- ❍ $3,000 to $3,499
- ❍ $3,500 to $4,999
- ❍ $5,000 to $5,499
- ❍ $5,500 to $5,999
- ❍ $6,000 to $6,499
- ❍ $6,500 to $6,999
- ❍ $7,000 or more

36. Have you applied to PA school before this academic year?
❍ Yes
❍ No

37. For each of the following health professional careers, select the status that applies to you.

	Did not consider	Considered but did not apply	Applied but was not accepted	Accepted but did not attend	Attended but did not complete	Completed or graduated
Alternative/complementary/naturopathic medicine	❍	❍	❍	❍	❍	❍
Audiology/speech pathology	❍	❍	❍	❍	❍	❍
Chiropractic	❍	❍	❍	❍	❍	❍
Dentistry	❍	❍	❍	❍	❍	❍
Emergency technician	❍	❍	❍	❍	❍	❍
Medical school (MD/DO) in the U.S.	❍	❍	❍	❍	❍	❍
Medical school (MD/DO) outside the U.S.	❍	❍	❍	❍	❍	❍
Nurse practitioner (NP)	❍	❍	❍	❍	❍	❍
Nursing (other than NP)	❍	❍	❍	❍	❍	❍
Occupational therapy (OT)	❍	❍	❍	❍	❍	❍
Occupational therapy assistant	❍	❍	❍	❍	❍	❍
Optometry	❍	❍	❍	❍	❍	❍
Pharmacy	❍	❍	❍	❍	❍	❍
Physical therapy (PT)	❍	❍	❍	❍	❍	❍
Physical therapy assistant	❍	❍	❍	❍	❍	❍
Public health	❍	❍	❍	❍	❍	❍
Social work	❍	❍	❍	❍	❍	❍
Sports medicine	❍	❍	❍	❍	❍	❍
Surgical assistant	❍	❍	❍	❍	❍	❍
Veterinary medicine	❍	❍	❍	❍	❍	❍
Other health profession, please specify	❍	❍	❍	❍	❍	❍

38. Please indicate how the following factors influenced your decision to become a PA.

	Did not use/have not heard of	Made me NOT WANT to become a PA	No influence on my decision to become a PA	Made me WANT to become a PA
AAPA website/literature	❍	❍	❍	❍
PAEA website/literature	❍	❍	❍	❍
PA program literature	❍	❍	❍	❍
College/campus admissions department	❍	❍	❍	❍
Public media (e.g., television)	❍	❍	❍	❍
Social media	❍	❍	❍	❍
Project Access	❍	❍	❍	❍
Previous healthcare experience	❍	❍	❍	❍
Previous military experience	❍	❍	❍	❍
PA program faculty/staff	❍	❍	❍	❍
Friend	❍	❍	❍	❍
Family member	❍	❍	❍	❍
Career counselor/teacher (HS or college)	❍	❍	❍	❍
Physician who treated me/my family	❍	❍	❍	❍
Other physician acquaintance	❍	❍	❍	❍
PA who treated me/my family	❍	❍	❍	❍
Other PA acquaintance	❍	❍	❍	❍
Other health professional	❍	❍	❍	❍
Other, please specify	❍	❍	❍	❍

39. As you were choosing which PA programs you would like to attend, which of the following program attributes did you consider and how important was it to you that your PA program have these attributes?

	Did not consider	Did consider: Not important	Did consider: Somewhat important	Did consider: Very important	Did consider: essential
Quality program facilities (e.g., labs and equipment)	❍	❍	❍	❍	❍
Desirable program location	❍	❍	❍	❍	❍
Rigorous clinical curriculum	❍	❍	❍	❍	❍
Many opportunities to gain clinical experience (e.g., rotations)	❍	❍	❍	❍	❍
Good program reputation	❍	❍	❍	❍	❍
Good faculty reputation	❍	❍	❍	❍	❍
Small class size/student-faculty ratio	❍	❍	❍	❍	❍
High likelihood of admission	❍	❍	❍	❍	❍
High PANCE pass rates	❍	❍	❍	❍	❍
Program mission consistent with personal values	❍	❍	❍	❍	❍
Low tuition	❍	❍	❍	❍	❍
Program offers scholarships and financial aid	❍	❍	❍	❍	❍

Affiliated with a hospital or clinic system	❍	❍	❍	❍	❍
Diverse student body	❍	❍	❍	❍	❍
Diverse faculty	❍	❍	❍	❍	❍
Dual degree offered (PA plus MPH)	❍	❍	❍	❍	❍

40. Please rate how the following experiences influenced your decision to accept the offer of admission to the program in which you are currently enrolled.

	Made me not want to attend the program	No influence on my decision to attend the program	Made me want to attend the program	Did not experience
Conversations with program faculty and staff	❍	❍	❍	❍
Conversations with current students	❍	❍	❍	❍
Conversations with program alumni	❍	❍	❍	❍
Program interview experience	❍	❍	❍	❍
Program admissions outreach/recruitment efforts	❍	❍	❍	❍

Work Experience

41. Have you ever been employed in a healthcare field (excluding internships or other experiences related to completion of a degree)?

❍ Yes
❍ No
❍ I prefer not to answer

41a. Please check the appropriate box(es) if you have experience in one or more of the following healthcare professions or fields.

❑ Alternative/complementary/naturopathic medicine
❑ Athletic trainer
❑ Case manager

- ❑ Chiropractor
- ❑ Dental assistant/hygienist
- ❑ Emergency room technician
- ❑ EMT/paramedic
- ❑ Healthcare administrator
- ❑ Heath services researcher
- ❑ Home health aide
- ❑ Medic or medial corpsman
- ❑ Medical assistant
- ❑ Medical lab technician
- ❑ Medical reception/records
- ❑ Medical technician
- ❑ Nurse practitioner
- ❑ Nurse, licensed practical
- ❑ Nurse, registered
- ❑ Nursing assistant
- ❑ Nutritionist/dietitian
- ❑ Occupational therapist/occupational therapy assistant
- ❑ Optometrist
- ❑ Pharmacist
- ❑ Pharmacy technician
- ❑ Phlebotomist
- ❑ Physical therapist/physical therapy assistant
- ❑ Physician
- ❑ Podiatrist
- ❑ Psychologist
- ❑ Radiology technician
- ❑ Respiratory technician
- ❑ Scribe
- ❑ Social worker
- ❑ Sonographer
- ❑ Other, please specify: _____

41b. How many weeks and hours per week did you work in a healthcare field? Please only include paid work experiences.

	Direct patient contact (e.g., Nurse or nursing aide)	Healthcare setting (indirect patient contact; e.g., medical secretary or receptionist)
Weeks Hours per week		

42. Have you ever participated in any paid or voluntary community service work (e.g., Peace Corps, AmeriCorps, service learning activities, mission work)?

❍ Yes
❍ No
❍ I prefer not to answer

42a. How many weeks did you spend in the following settings during your paid or voluntary community service work?

	Weeks of paid experiences	Weeks of volunteer experiences	Weeks of service learning experiences associated with completion of academic studies
International medical			
International non-medical			
U.S. medical			
U.S. non-medical			

43. Please rate the desirability of practicing in the following environments.

	Very undesirable	Undesirable	Neither desirable or undesirable	Desirable	Very desirable
Inner city	❍	❍	❍	❍	❍
Rural	❍	❍	❍	❍	❍
Suburban	❍	❍	❍	❍	❍
Urban	❍	❍	❍	❍	❍
Federal/state prison system	❍	❍	❍	❍	❍
Military base(s)	❍	❍	❍	❍	❍
Practice outside the US	❍	❍	❍	❍	❍
Native American/American Indian Reservation	❍	❍	❍	❍	❍
Veterans Affairs (VA)	❍	❍	❍	❍	❍

44. Upon graduation, how likely are you to choose to work in a medically underserved community?Note: Examples of medically underserved communities include inner city, rural, prison, military and VA, and Native American/American Indian reservations.

- ❍ Very likely
- ❍ Likely
- ❍ Neither likely nor unlikely
- ❍ Unlikely
- ❍ Very unlikely

45. In what state are you the most likely to practice following graduation?

- ❍ International: Non-US
- ❍ American Samoa
- ❍ Marshall Islands
- ❍ Puerto Rico
- ❍ US Virgin Islands
- ❍ Alabama
- ❍ Alaska
- ❍ Arizona
- ❍ Arkansas
- ❍ California
- ❍ Colorado
- ❍ Connecticut
- ❍ Delaware
- ❍ District of Columbia
- ❍ Florida
- ❍ Georgia
- ❍ Hawaii
- ❍ Idaho
- ❍ Illinois
- ❍ Indiana
- ❍ Iowa
- ❍ Kansas
- ❍ Kentucky
- ❍ Louisiana
- ❍ Maine
- ❍ Maryland
- ❍ Massachusetts
- ❍ Michigan
- ❍ Minnesota
- ❍ Mississippi
- ❍ Missouri
- ❍ Montana
- ❍ Nebraska
- ❍ Nevada
- ❍ New Hampshire
- ❍ New Jersey
- ❍ New Mexico
- ❍ New York
- ❍ North Carolina
- ❍ North Dakota
- ❍ Ohio
- ❍ Oklahoma
- ❍ Oregon
- ❍ Pennsylvania
- ❍ Rhode Island

- ❍ South Carolina
- ❍ South Dakota
- ❍ Tennessee
- ❍ Texas
- ❍ Utah
- ❍ Vermont
- ❍ Virginia
- ❍ Washington
- ❍ West Virginia
- ❍ Wisconsin
- ❍ Wyoming

46. How likely are you to pursue a career as a PA educator in the future?
- ❍ Very likely
- ❍ Likely
- ❍ Neither likely nor unlikely
- ❍ Unlikely
- ❍ Very unlikely

47. Please rate the desirability of practicing in the following specialty areas after your graduation.

	Undesirable	Neither desirable nor undesirable	Desirable	Do not know enough about it
Family/General medicine	❍	❍	❍	❍
General internal medicine	❍	❍	❍	❍
General pediatrics	❍	❍	❍	❍
Geriatrics	❍	❍	❍	❍
Obstetrics/Gynecology/Women's health	❍	❍	❍	❍
General surgery	❍	❍	❍	❍
Orthopedics	❍	❍	❍	❍
Cardiovascular/Cardiothoracic	❍	❍	❍	❍
Neurosurgery	❍	❍	❍	❍
Urology	❍	❍	❍	❍
Plastic surgery	❍	❍	❍	❍
Other surgical subspecialties, please specify:	❍	❍	❍	❍
Emergency medicine (not urgent care)	❍	❍	❍	❍
Urgent care	❍	❍	❍	❍
Cardiology	❍	❍	❍	❍
Oncology/Hematology	❍	❍	❍	❍
Nephrology	❍	❍	❍	❍
Endocrinology	❍	❍	❍	❍
Gastroenterology	❍	❍	❍	❍
Infectious Disease	❍	❍	❍	❍
Rheumatology	❍	❍	❍	❍
Other internal medicine subspecialty, please specify:	❍	❍	❍	❍
Critical care	❍	❍	❍	❍
Hospitalist	❍	❍	❍	❍
Dermatology	❍	❍	❍	❍
Neurology	❍	❍	❍	❍
Interventional radiology	❍	❍	❍	❍
Palliative care	❍	❍	❍	❍
Pain management	❍	❍	❍	❍
Retail clinic	❍	❍	❍	❍
Pediatric subspecialties	❍	❍	❍	❍

Occupational medicine	❍	❍	❍	❍
Psychiatry/Behavioral medicine	❍	❍	❍	❍
Correctional medicine	❍	❍	❍	❍
Other specialty, please specify:	❍	❍	❍	❍
Gastroenterology	❍	❍	❍	❍

47a. Please rank each specialty that you are interested in based on your desire to practice in them after graduation. Drag the specialties into the correct order. '1' should be the specialty you want to practice in the most.

_____ Family/General medicine
_____ General internal medicine
_____ General pediatrics
_____ Geriatrics
_____ Obstetrics/Gynecology/Women's health
_____ General surgery
_____ Orthopedic surgery
_____ Cardiovascular/Cardiothoracic surgery
_____ Neurosurgery
_____ Urologic surgery
_____ Plastic surgery
_____ Other surgical subspecialties: ${q://QID132/ChoiceTextEntryValue/12}
_____ Emergency medicine (not urgent care)
_____ Urgent care
_____ Cardiology
_____ Oncology/Hematology
_____ Nephrology
_____ Endocrinology
_____ Gastroenterology
_____ Infectious disease
_____ Rheumatology
_____ Other internal medicine subspecialty: ${q://QID132/ChoiceTextEntryValue/23}
_____ Critical care
_____ Hospitalist
_____ Dermatology
_____ Neurology
_____ Interventional radiology
_____ Palliative care
_____ Pain management
_____ Retail clinic
_____ Pediatric subspecialties
_____ Occupational medicine
_____ Psychiatry/Behavioral medicine
_____ Correctional medicine
_____ Other specialty: ${q://QID132/ChoiceTextEntryValue/36}

48. Please estimate the annual salary you expect at graduation for a full-time position as a PA.

- ❍ $49,999 or less
- ❍ $50,000 to $59,999
- ❍ $60,000 to $69,999
- ❍ $70,000 to $79,999
- ❍ $80,000 to $89,999
- ❍ $90,000 to $99,999
- ❍ $100,000 to 109,999
- ❍ $110,000 to $119,999
- ❍ $120,000 to $129,999
- ❍ $130,000 or more

49. This question is based on an item from Higher Education Research Institute's (HERI) College Senior Survey. When thinking about your career path after PA school, how important are the following considerations?

	Not important	Somewhat important	Very important	Essential
Ability to pay off debt	❍	❍	❍	❍
Availability of jobs	❍	❍	❍	❍
Flexible working schedule	❍	❍	❍	❍
High income potential	❍	❍	❍	❍
High level of autonomy	❍	❍	❍	❍
Leadership potential	❍	❍	❍	❍
Social recognition or status	❍	❍	❍	❍
Stable, secure future	❍	❍	❍	❍
Supervising physician relationship	❍	❍	❍	❍
Work/life balance	❍	❍	❍	❍
Working for social change	❍	❍	❍	❍

50. Which of the following best describes your current civil status? Note: If you are engaged, please select "single".

- ❍ Single (never legally married)
- ❍ Married
- ❍ Domestic partnership
- ❍ Civil union
- ❍ Separated, but still legally married
- ❍ Divorced
- ❍ Widowed
- ❍ Other, please specify: _____
- ❍ I prefer not to answer

51. Other than yourself, how many legal dependents do you have? If you do not have any legal dependents, please enter "0".

52. Are you considered a dependent by your parents (i.e., did they claim you on their income taxes last year)?

- ❍ Yes
- ❍ No
- ❍ I do not know/prefer not to answer

53. What is your parents'/guardians' combined estimated gross income?

- ❍ Less than $25,000
- ❍ $25,000 to $49,999
- ❍ $50,000 to $74,999
- ❍ $75,000 to $99,999
- ❍ $100,000 to $149,999
- ❍ $150,000 to $199,999
- ❍ $200,000 to $249,999
- ❍ $250,000 to $299,999
- ❍ $300,000 or higher
- ❍ I do not know/prefer not to answer

54. What is the estimated gross income for your household (this includes your income in addition to the income of your spouse/partner, if applicable)?

- ❍ Less than $25,000
- ❍ $25,000 to $49,999
- ❍ $50,000 to $74,999
- ❍ $75,000 to $99,999
- ❍ $100,000 to $149,999
- ❍ $150,000 to $199,999
- ❍ $200,000 to $249,999
- ❍ $250,000 to $299,999
- ❍ $300,000 or higher
- ❍ I do not know/prefer not to answer

55. What is the highest level of education of your parent(s) or guardian(s)? For example, if one parent/guardian holds an Associate's degree, and one holds a Master's degree, please select "Master's degree."

- ❍ Some high school
- ❍ High school diploma/GED
- ❍ Some college
- ❍ Associate's degree
- ❍ Bachelor's degree
- ❍ Master's degree
- ❍ Academic doctorate (e.g., PhD, EdD)
- ❍ Professional doctorate (e.g.., MD, DO, PharmD, JD)
- ❍ Other, please specify: _____
- ❍ I prefer not to answer

Financing Your Education All of the information you share in this survey, including financial data, is confidential and will not be released to your school or any other person or institution. No identifying information will be linked to your answers. The information you provide will help the PA community and PAEA better understand the costs of education, and inform advocacy efforts to make PA education more affordable. If you cannot remember the actual figures for some of the questions, please enter your best estimates. You may also check your federal loans, grants, and aid overpayments at the National Student Loan Data System.

56. Have you received any scholarships, stipends, or grants (not loans) for the professional phase of your PA program?

- ❍ Yes
- ❍ No

56a. Please enter the dollar amount of the scholarships, stipends, or grants (not loans) that have been offered to you, and you have accepted, for the professional phase of your PA education. If you prefer not to provide a dollar amount, we would appreciate if you could select the category that best represents the amount. Amount of scholarships, stipends, grants (not loans) that have been offered to you, and you have accepted, for the professional phase professional phase of your PA education:

Amount of scholarships, stipends, grants (not loans) that have been offered to you, and you have accepted, for the professional phase of your PA education:
- ❍ $1 to $4,999
- ❍ $5,000 to $9,999
- ❍ $10,000 to $14,999
- ❍ $15,000 to $19,999
- ❍ $20,000 to $24,999
- ❍ $25,000 to $29,999
- ❍ $30,000 to $49,999
- ❍ $50,000 to $74,999
- ❍ $75,000 to $99,999
- ❍ $100,000 or more

57. Do you have any outstanding pre-PA (undergraduate or non-PA graduate) educational loans?
- ❍ Yes
- ❍ No
- ❍ I prefer not to answer

57a. Please enter the dollar amount that you owe on your outstanding pre-PA (undergraduate or non-PA graduate) educational loans, excluding interest. We ask for this in order to provide the most accurate data possible to our government relations team, who work to make PA education more affordable for all students. If you prefer not to provide a dollar amount, we would appreciate if you could select the category that best represents the amount you owe on your outstanding pre-PA educational loans. Amount you owe of outstanding pre-PA (undergraduate or non-PA graduate) educations loans, excluding interest:

Amount you owe of outstanding pre-PA (undergraduate or non-PA graduate) educational loans, excluding interest:
- ❍ $1 to $24,999
- ❍ $25,000 to $49,999
- ❍ $50,000 to $74,999
- ❍ $75,000 to $99,999
- ❍ $100,000 to $124,999
- ❍ $125,000 to $149,999
- ❍ $150,000 to $174,999
- ❍ $175,000 to $199,999
- ❍ $200,000 to $224,999
- ❍ $225,000 or more

58. Do you have any outstanding service indebtedness for your pre-PA education (e.g., undergraduate and/or non-PA graduate education)?
- ❍ Yes
- ❍ No

58a. Please select the type of service requirement you have (e.g., military service, National Health Service Corps).

- ❍ Armed Services (e.g., Navy, Army, Air Force)
- ❍ Department of Education's Public-Service Loan Forgiveness (PSLF)
- ❍ Indian Health Service Corps
- ❍ National Health Service Corps
- ❍ State loan forgiveness program
- ❍ Uniformed Service (Center of Disease Control, Department of Health and Human Services)
- ❍ Other, please specify: _____

58b. Please enter the total number of years required to fulfill your service requirement, and the number of years you have already completed.

	Total number of years required to fulfill your service requirement	Number of years you have already completed
Years		

59. How were your pre-PA (undergraduate and/or pre-PA graduate) education costs paid? This refers to any education costs prior to entering your professional/graduate PA program. Please select all sources that apply.

- ❑ Loans
- ❑ Money earned by spouse/partner
- ❑ Other family support
- ❑ Personal income and savings
- ❑ Scholarships or awards from external sources
- ❑ Scholarships or awards from your college/university
- ❑ Work study program
- ❑ Other, please specify _____
- ❑ I prefer not to answer

59a. Please estimate the percentage of your pre-PA (undergraduate and/or pre-PA graduate) education costs that was paid for by each source.

	%
Loans	
Money earned by spouse/partner	
Other family support	
Personal income and savings	
Scholarships or awards from external sources	
Scholarships or awards from your college/university	
Work study program	
Other: ${q://QID103/ChoiceTextEntryValue/8}	
I prefer not to answer	

60. How do you plan to finance your professional/graduate PA education? Please select all sources that apply.

- ❑ Loans
- ❑ Money earned by spouse/partner
- ❑ Other family support
- ❑ Personal income and savings
- ❑ Scholarships or awards from external sources
- ❑ Scholarships or awards from your college/university
- ❑ Work study program
- ❑ Other, please specify _____
- ❑ I prefer not to answer

60a. Please estimate the percentage of your professional/graduate PA education costs that will come from each source. The total of all sources must equal 100%. If you prefer not to answer, please enter '100' in the box by 'I prefer not to answer.'

	%
Loans	
Money earned by spouse/partner	
Other family support	
Personal income and savings	
Scholarships or awards from external sources	
Scholarships or awards from your college/university	
Work study program	
Other: ${q://QID140/ChoiceTextEntryValue/8}	
I prefer not to answer	

61. Did you take out any educational loans to pay for the professional phase of your PA education?

- ❍ Yes
- ❍ No
- ❍ I prefer not to answer

61a. Please enter the outstanding dollar amount of the educational loans you took out to pay for the professional phase of your PA education, excluding interest. We ask for this in order to provide the most accurate data possible to our government relations team, who work to make PA education more affordable for all students. If you prefer not to provide a dollar amount, we would appreciate if you could select the category that best represents the amount you of PA educational loans you hold.

Amount of outstanding educational loans you took out to pay for the professional phase of your PA education, excluding interest.

- ❍ $1 to $24,999
- ❍ $25,000 to $49,999
- ❍ $50,000 to $74,999
- ❍ $75,000 to $99,999
- ❍ $100,000 to $124,999
- ❍ $125,000 to $149,999
- ❍ $150,000 to $174,999
- ❍ $175,000 to $199,999
- ❍ $200,000 to $224,999
- ❍ $225,000 or more

62. Do you have any non-educational, consumer debt? This includes credit card debt, car loans, mortgages, or other consumer debt.

❍ Yes
❍ No
❍ I prefer not to answer

62a. Please estimate the dollar amount(s) of non-educational, consumer debt you currently have. Please enter 0 for non-applicable categories and do not use dollar signs or commas. If you prefer not to provide a dollar amount, we would appreciate if you could select the category(ies) that best represents the amount(s) you owe. We ask for this in order to provide the most accurate data possible to our government relations team, who work to make PA education more affordable for all students. This information will help PAEA gather a more complete picture of PA students' financial situations.

	Dollar Amount
Car loan(s)	
Credit card(s)	
Mortgage(s)	
Other consumer loan(s)	

Amount of non-educational, consumer debt:

	N/A: $0	$1 to $4,999	$5,000 to $9,999	$10,000 to $14,999	$15,000 to $19,999	$20,000 to $24,999	$25,000 to $29,999	$30,000 to $49,999	$50,000 to $74,999	$75,000 to $99,999	$100,000 or more
Car loan(s)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Credit card(s)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Other consumer loan(s)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

Amount of non-educational, consumer debt: mortgage(s).

	N/A: $0	$1 to $4,999	$5,000 to $9,999	$10,000 to $14,999	$15,000 to $19,999	$20,000 to $24,999	$25,000 to $29,999	$30,000 to $49,999	$50,000 to $74,999	$75,000 to $99,999	$100,000 to $124,999	$125,000 to $149,999	$150,000 to $174,999	$175,000 to $199,999	$200,000 to $224,999	$225,000 to $249,999	$250,000 to $274,999	$275,000 to $299,999	$300,000 to $349,999	$350,000 to $399,999	$400,000 to $449,999	$450,000 to $499,999	$500,000 to $549,999	$550,000 to $599,999	$600,000 or higher
Mortgage(s)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

63. What do you anticipate your total debt (excluding personal debt) to be from attending PA school?

- ❍ $0
- ❍ $1 to $24,999
- ❍ $25,000 to $49,999
- ❍ $50,000 to $74,999
- ❍ $75,000 to $99,999
- ❍ $100,000 to $124,999
- ❍ $125,000 to $149,999
- ❍ $150,000 to $174,999
- ❍ $175,000 to $199,999
- ❍ $200,000 or greater
- ❍ I prefer not to answer

64. Thank you for your participation. Please comment below on any questions that you considered to be confusing or difficult to respond to. We would also appreciate any other feedback you would like to offer in order to improve our survey.

If you are interested in being entered into a drawing for one of four $25 Amazon gift cards, please provide your email address below. Your email address is not stored with your responses and will be permanently deleted as soon as the drawing is complete.

If you have any questions or need to report any errors concerning your survey, please contact PAEA Research Staff at research@PAEAonline.org. If you need to change any responses, PAEA Research Staff will be happy to assist you. Please be sure to hit the "submit" button and close this browser window when you are done in order to protect your privacy. Best wishes for your PA career, PAEA Research Staff.

Appendix E

IRB Approval

IRB Approval

1/19/2018 Bethel University Mail - IRB Question

IRB Question

Peter Jankowski <pjankows@bethel.edu> To: Christy Hanson <c-hanson@bethel.edu> Cc: Craig Paulson <craig-paulson@bethel.edu>, Wallace Boeve <w-boeve@bethel.edu>

Hi Christy,

Fri, Jan 19, 2018 at 11:09 AM

Christy Hanson <c-hanson@bethel.edu>

Yes, the feedback you've received thus far is correct. Archival data is level 3 research according to our IRB policy. We do not have an exempt category, per se. And so, yes, departmental level review and approval would be appropriate for this research. And since your department has a mechanism for such approvals then that would be the way to proceed.

Peter

[Quoted text hidden]--Peter Jankowski, Ph.D., LMFT, LPC Associate Professor MA Counseling Program Bethel University 3900 Bethel Dr. St. Paul, MN 55112 651-638-6901 651-638-6001 (fax)

https://mail.google.com/mail/u/1/?ui=2&ik=24a503616c&jsver=dSZRinUJdWo.en.&view=pt&msg=1610f656c8823fa4&search=inbox&siml=1610f656c8823fa4 1/1

BETHEL UNIVERSITY

Christy Hanson <c-hanson@bethel.edu>

Dissertation Forms

Craig Paulson <craig-paulson@bethel.edu> Thu, Feb 22, 2018 at 10:59 PM
To: Christy Hanson <c-hanson@bethel.edu>
Cc: Jessica Daniels <j-daniels@bethel.edu>, Diane Dahl <diane-dahl@bethel.edu>, Bethel University Doctor of Education <edd@bethel.edu>, Mary Whitman <m-whitman@bethel.edu>, Erica Hering <e-hering@bethel.edu>, Tracy Reimer <t-reimer@bethel.edu>

Hi Christy,

Your IRB proposal has been approved by the Bethel University Level II IRB Committee with the approval code of 022218-01.

Once your dissertation advisor (Diane Dahl) gives you permission, you may proceed forward with you research.

Best wishes !

Craig

Appendix F

Confirmation of Authorization to Obtain CASPA and PAEA Data

Confirmation of Authorization to Obtain CASPA and PAEA Data

Christy Hanson <c-hanson@bethel.edu>

Checking in

Donovan Lessard <dlessard@paeaonline.org> Tue, Feb 20, 2018 at 2:15 PM

To: Christy Hanson <c-hanson@bethel.edu>

You have been authorized to get the requested data. You will receive it by 5 pm on Thursday, March 1.

You can keep the data on a password protected computer. No copies can be made of the dataset and it cannot be distributed. While I'm thinking of it, please also complete the non-disclosure agreement.

Thanks,

On Tue, Feb 20, 2018 at 1:48 PM, Christy Hanson <c-hanson@bethel.edu> wrote:

Hi Donovan,

I just wanted to follow-up on this. Is it possible to get an email just confirming that I have been authorized to obtain this data from PAEA?

One other question, is there a policy about what I should do with the raw data once I am done with the project? Is it OK to keep it in a locked file on a password protected computer, or do I need to discard the data somehow?

Thanks again!

Christina B. Hanson, MPAS, PA-C

Associate Professor | Physician Assistant Program

Bethel University | Graduate School

3900 Bethel Drive, St. Paul, MN 55112

651.635.8042

https://www.bethel.edu/graduate/academics/physician-assistant/

Donovan Lessard, MA

Director of Research/Senior Data Analyst

Physician Assistant Education Association

703-667-4335

Appendix G

Total Number and Expected Counts for Negative Ratings on the MSS

Total Number and Expected Counts for

Negative Ratings on the MSS

	URM	Expected Count	Non-URM	Expected Count
AAPA website/literature	2	0.7	4	5.3
PAEA website/literature	2	0.5	2	3.5
PA Program literature	2	1.5	10	10.5
College/Campus admissions department	5	3.6	25	26.4
Public Media	5	2.6	16	18.4
Social Media	3	1.1	6	7.9
Project Access	1	0.4	2	2.6
Previous Healthcare Experience	3	2.7	19	19.3
Previous Military Experience	1	0.6	4	4.4
PA Program Faculty/Staff	2	1.8	13	13.2
Friend	3	2.6	18	18.4
Family member	7	6.3	45	45.7
Career Counselor/ Teacher	9	4.9	31	35.1
Physician for me/my family	8	4.7	31	34.3
Other physician acquaintance	4	4.9	36	35.1
PA for me/my family	4	2.2	14	15.8
Other PA acquaintance	2	1.9	14	14.1
Other health professional	5	2.7	17	19.3