5-2019

The Influence Of Noncognitive Skills In Physician Assistant Education

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THE INFLUENCE OF NONCOGNITIVE SKILLS IN PHYSICIAN ASSISTANT EDUCATION

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A DISSERTATION

Presented to the Affiliated Faculty of

The College of Graduate and Professional Studies

at the University of New England

In Partial Fulfillment of Requirements

For the Degree of Doctor of Education

Portland & Biddeford, Maine

May, 2019

Lynn Eckrote
May, 2019
Educational Leadership

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ABSTRACT

A holistic approach to the admission process in a physician assistant (PA) program can emphasize skills beyond the traditional measures of cognitive skills. The purpose of this study was to investigate the experiences that directors of physician assistant programs have with applying the MMI as a measure of noncognitive skills in the admission process. Physician assistant programs often do not put an equal focus on cognitive and noncognitive skills. This study addressed the research question: What experiences have PA directors had with applying the MMI as a measure of noncognitive skills in the admission process? The participants of this study were PA directors who have experience with the MMI as part of the admission process. One on one interviews were conducted, recorded, and transcribed with a phenomenological approach to analyze the qualitative data. Six themes were identified as a result of the qualitative data collection. These themes were holistic review, rater training consistency, development and reinforcement of noncognitive skills, directors report an overall positive experience, data collected by programs not yet analyzed, and a change in student demographics. Recommendations included PA programs implementing a holistic approach to the admission process in order to assess a candidate's noncognitive skills. Also, PA directors should make data collection, review, and analysis a priority to horizontally and longitudinally align curriculum and evaluations, and to determine if the MMI can be correlated with student outcomes.

University of New England

Doctor of Education
Educational Leadership

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ACKNOWLEDGEMENTS

Life is not a sprint, but a marathon, and the same goes for writing and successfully completing a doctoral dissertation. I want to thank my family and friends for being present throughout the journey and continually cheering me on. It takes a village, and I am so blessed to have some amazing people to be by my side.

Thank you to my dissertation committee for all of their help and guidance. Dr. Clark, you kept me calm and confident. Thank you for being so receptive. Dr. Heard, your attention to detail was so greatly appreciated. Thank you for being so thorough. Dr. Henninger, thank you for being my mentor. I have learned leadership qualities from you that I will carry throughout my career.

To my family, whom I adore. Thank you for your patience and support. To my husband, Kevin, you are my forever partner in this crazy life, and I thank you for keeping me grounded and balanced. To my children, Mickenzie Rose and Michael Kevin, thank you for encouraging me in ways you do not even understand. Thank you for being proud of me and I am so thankful to be your mom. To my mom, thank you for pushing me and always wanting the best for me. We have done very well facing the world together. To my best friend, Sandy, your friendship is the truest form. Thank you for always listening and being a part of our family. I love all of you with all of my heart and soul.

DEDICATION

For my dad, Michael Frank Acri. I know you are watching me from above and I will always be your little girl.

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Chapter 1

Introduction

With the ever-growing population in the United States, the increase in life expectancy and the overwhelming need for health care providers, there is an increase demand and need for physician assistants (PAs) (Anderson et al., 2012). PAs are nationally certified and state-licensed medical professionals who work as part of a healthcare team. PAs diagnose acute and chronic conditions, manage treatment plans, prescribe medications, and often serve as a patient's principal provider. Stead founded the PA profession in the mid-1960s, when it was recognized by physicians and educators that there was a shortage of primary care providers (American Academy of Physician Assistants (AAPA), 2018). Today, PAs can be found practicing in all 50 states and in every medical setting and specialty, working hard to improve healthcare access and quality (AAPA, 2018). Furthermore, states are loosening restrictions to PAs allowing for more collaborative work with physicians as part of an interdisciplinary team. As a physician shortage continues and patients are becoming more comfortable being treated by a health care provider other than a physician, states continue to change regulations and scope of practice laws to allow more autonomy to PAs (Jaspen, 2018).

The goal of any PA program is to produce competent PAs who serve the community in various health care specialties and locations. PAs work in all areas of medicine that include family practice, pediatrics, internal medicine, emergency and urgent care settings, women's health, surgery (general and sub-specialties), behavioral health, outpatient offices and inpatient hospitals, and in both rural and urban areas (AAPA, 2018). According to *Business Insider,* physician assistant is ranked the number one job in America (Gillett, 2015). Current employment trend reports published by the Bureau of Labor statistics state that employment of PAs is

expected to increase 30 percent from 2014 to 2024, much faster than the average for all occupations (Bureau of Labor Statistics (Statistics), 2017).

At the state level, data from the Pennsylvania Center for Workforce Information & Analysis (CWIA) confirmed that healthcare employers throughout Pennsylvania indicate that positions that require extensive training are going unfilled as they struggle to find qualified candidates (Pennsylvania Center for Workforce Information and Analysis (Analysis), 2017). The occupational areas where high growth is projected in the near future include PAs. Projections indicate that the PA occupation will experience employment growth, and the PA occupation has been added to the high priority occupation list as of 2015 (Analysis, 2017).

The purpose of this study is to investigate the experiences that PA directors have with applying the multiple mini interview (MMI) as a measure of noncognitive skills in the admission process. Noncognitive skills are measured differently than cognitive skills. There are defined expectations with cognitive skills as there is a great deal of focus placed on the first-time pass rates for the Physician Assistant National Certification Exam (PANCE). Students who graduate from an accredited program must take this exam prior to being able to work as a certified PA. Programs often attempt to predict which factors contribute to first-time pass rates. Studies have been done comparing the relationship between summative examinations and PANCE results (Massey & Lee, 2013), and correlations between PANCE and program grade point average and selection criteria (Brown & Imel, 2013). Both studies concluded that there is a correlation between these factors, but further research should be completed (Brown & Imel, 2013; Massey & Lee, 2013). Another study examined the relationship between the length of a program and PANCE pass rates, and concluded that there was no correlation between length of program and first time PANCE pass rates (Colletti, Salisbury, Hertelendy, & Tseng, 2016). Although much

emphasis for success is placed on PANCE results, noncognitive skills cannot be used to predict the success or outcome of PANCE, because PANCE only evaluates cognitive attributes and not noncognitive skills (Brenneman et al., 2018). For this reason, PANCE cannot be used in this study to determine success.

Typically, cognitive skills, as measured by grade point averages and test scores, have been given higher priority than noncognitive skills in the admission process. However, there is a growing consensus that noncognitive skills are important to the overall skill set of a healthcare provider, and more attention should be placed during the PA program admission process on noncognitive skills, such as oral communication, critical thinking, problem solving, motivation, and professionalism (Brenneman et al., 2018). This study focused on the experiences of PA directors applying the MMI as an admission evaluation tool to measure noncognitive skills. The MMI is set up with multiple short interview stations focusing on noncognitive domains, and none of the stations anticipate prior health care knowledge on the part of the applicant (Reiter, Eva, Rosenfeld, & Norman, 2007). To improve the assessment of noncognitive skills, Axelson and Ferguson (2012) suggested developing explicit definitions of the desired skills being evaluated, structuring the data collection to observe instances of the desired traits through methods such as the MMI, training the evaluators on the assessment tool/evaluation process, and providing feedback to evaluators to provide additional resources for evaluators to decrease unconscious bias scoring (Axelson & Ferguson, 2012).

Noncognitive skills are defined as those skills that are "academically and occupationally relevant skills and traits that are not specifically intellectual or analytical in nature" (Rosen, Glennie, Dalton, Lennon, & Bozick, 2010, p. 1). With many changes within the healthcare system, there is a growing emphasis on patient satisfaction and understanding. These outcomes

require well-developed noncognitive skills. Employers are seeking well-developed noncognitive skills in PA graduates, and often individuals lack this important attribute (Brenneman et al., 2018). It is also noted that the absence of effective communication, from the provider to the patient, can lead to poor outcomes and ultimately be the root cause of malpractice claims (Brueck & Salib, 2017). Poor communication may not only create a barrier to practicing effective medicine, but can also raise concerns about cost and allocation of health resources. Additional research is on the horizon, however, according to Brueck & Salib (2017):

> Patients who feel that the physician does not respect their concerns, show empathy, or provide relevant information may have lower rates of compliance with recommended treatment options, leading to greater costs and expenditures, including those associated with increased hospital admissions. Physician communication, then, impacts not only the trajectory of the individual patient's care, but also the healthcare system as a whole. (p. 290)

PA programs have varying admission criteria. The goal of any admission process is to allow the programs to select the right student for the missions of both the institution and the PA program. This must be done in a fair, transparent, and legally defensible manner. The MMI is becoming increasingly popular among all health care programs as part of the admission process as it is shown to be cost-effective, efficient, and easy to implement (Glazer, et al., 2016). The MMI is a validated interview instrument and has demonstrated a "much higher reliability than standard interview methods, with a published overall test generalizability of 0.65" (Reiter, Eva, Rosenfeld, & Norman, 2007, p. 379). According to the Association of American Medical Colleges (2019), by using a holistic approach, a program's process is one in which balanced

consideration is given to experiences, skills, and academic metrics, and when considered in combination, how the individual might contribute value to the profession.

Statement of the Problem

In developing an admission process for a new PA program, this researcher used a holistic approach to emphasize skills beyond the traditional measures of cognitive skills. With such varying types of interviews used during the admission process, it is unclear which interview can most effectively test noncognitive skills. PA programs often do not put an equal focus on cognitive and noncognitive skills. During the interview process at physician assistant programs, there needs to be a method in place to assess noncognitive skills. According to Paget et al. (2011), better health outcomes, lower costs, improved patient satisfaction, and safety have all been associated with consistent and effective communication between the patient and the healthcare provider.

Purpose of the Study

The purpose of this study is to investigate the experiences that PA directors have with applying the MMI as a measure of noncognitive skills in the admission process. According to Brenneman et al. (2018) the President's Commission conducted a literature review to generate a list of more than 40 possible noncognitive skills that could be included as part of a PA program admission interview. From this list, a list of ten informal noncognitive skills has been created to include: empathy, ethical responsibility to self/others, oral communication, teamwork, critical thinking, resilience and adaptability, cultural competence, realistic self-appraisal, situational judgement, and professionalism (Brenneman et al., 2018).

Research Questions

This research addressed the experiences of PA directors have with using the MMI as a tool to measure noncognitive skills in the admission process. This study addressed the question: What experiences have PA directors had with applying the MMI as a measure of noncognitive skills in the admission process? Related questions are:

- What are the experiences of PA directors using the MMI as an admission evaluation tool?
- Based on the outcomes of the clinical year preceptor evaluation, what experiences have PA directors had with the MMI as a method to assess an applicant's noncognitive skills?
- What experiences have PA directors had with well-developed noncognitive skills contributing to improving medical practice?

Conceptual Framework

The conceptual framework for this study is based on Solberg's (2007) idea of improving medical practice (Appendix A). This framework focuses on three main elements, and all must be present in order for outcomes to be both substantial and possess quality. The three elements are priority, change process capability, and care process content. The distinguishing factor that sets this framework aside from others is that there is a "clear emphasis on a clear separation of the change process of the care process content" (Solberg, 2007, p. 254).

First, as with any change, there needs to be a desire for change to take place. The priority of the change must be shared by all involved. In this study, PA programs must be willing to discuss the both the potential positive and negative outcomes of measuring noncognitive skills by using the MMI.

Secondly, the capability to institute a change process must be present. The HealthPartners Medical Group (as cited by Solberg, 2007) suggests that the following factors are desired and important:

1. Strong effective leadership, both centrally and locally
2. Commonly understood framework and infrastructure for managing the change process
3. People at all levels with change management skills
4. Adequate resources and time devoted to the change process
5. A mature and capable clinical information system
6. Good communication and measurement skills
7. A high degree of trust and teamwork
8. Individual accountability
9. A high degree of involvement and engagement by personnel at all levels

Lastly, the care process changes must be made. This involves systems-level changes as opposed to asking individuals to simply do a better job (Solberg, 2007). Depending on the degree that the above factors are present in a PA program, a change effort can be developed, implemented, and sustained for improved assessment and evaluation of noncognitive skills, which will ultimately improve patient satisfaction therefore improving health care. Through this conceptual framework of improving medical practice, this researcher investigated the experiences that PA directors have had with assessing noncognitive skills and if those skills have an influence on improving medical practice.

Assumptions and Limitations

Given the fact there are no students enrolled in this researcher's developing PA program, this researcher must rely on other programs to provide data. Assumptions of this study are that PA programs will be willing to share accurate information about their experiences to conduct the research. Another assumption is that PA programs are measuring noncognitive skills at both the time of a student's admission using the MMI and then again during the clinical year through preceptor evaluations.

Limitations of this study include response bias, with data being highly subjective, and reliance placed on the participants to remember their experiences as they happened. Directors willing to share their experiences with this researcher were from programs where leaders already feel strongly about the importance of noncognitive skills at the time of admission. A second limitation is that didactic curriculum is not being taken into consideration. Some PA programs may "teach" noncognitive skills; therefore, the score of noncognitive skills at the time of preceptor evaluations would also be influenced by the didactic year curriculum. Programs representatives were asked if they teach noncognitive skills to assist with data interpretation. Additional limitations include possibility of a Hawthorne effect (Cherry, 2018) since this researcher's presence during the data gathering is unavoidable, reactions may be influenced by the fact that the participants are being observed. The results cannot be generalized to wider populations of PA programs with the same degree of certainty as quantitative analysis as this research cannot be tested for statistical significance. Finally, this research will not be assessing alternative methods used to assess noncognitive skills.

Significance

Studies have been conducted between academic admission criteria and performance on both the Physician Assistant Clinical Knowledge Rating and Assessment Test (PACKRAT) and PANCE exams. PACKRAT is available through the Physician Assistant Education Association and is an objective, comprehensive self-assessment tool for both student and curricular evaluation. This test is typically offered to students at the end of the didactic year and then at the end of the clinical year. (Physician Assistant Education Association (PAEA), 2019). Minimal research has been conducted on noncognitive skills and performance in both the academic and clinical phases in medical education, and studies that have been conducted are mainly outside the United States (Brenneman et al., 2018). With the difficulty in measuring noncognitive skills, as compared to cognitive skills, there is little evidence to support noncognitive skills in medical education programs. It has been noted, however, that studies are limited possibly because researchers have been attempting to predict academic performance from noncognitive skills instead of predicting clinical performance from noncognitive skills. It has been recommended that for PA researchers, a potential investigation could be between noncognitive skills and the clinical practice setting (Brenneman et al., 2018).

The significance of this study may be findings that influence how PA programs measure and assess noncognitive skills in the admission process. The impact could be important to the trends of healthcare as more and more emphasis is being placed on noncognitive skills in a healthcare provider. According to Brenneman et al. (2018):

> The PA profession has an opportunity to advance the science of admission by reweighting noncognitive skills when choosing who will be successful as students and future clinicians and determining how to assess these factors. The PA should begin in

> earnest to undertake studies that examine noncognitive skills deemed important in the admission processes and how they correlate with the delivery of optimal care to patients in practice. (p. 25)

Definition of Terms

ARC-PA - The Accreditation Review Commission on Education for the Physician Assistant is the accrediting body of PA programs.

Clinical year – The clinical year is the second year of a PA program, which includes instruction in various clinical sites. Students typically complete eight to nine different clinical rotations that are approximately five to six weeks in length.

Clinical preceptor – Clinical preceptors are typically volunteers who allow PA students to integrate into their day, and under their supervision, observe and participate in patient encounters.

Cognitive attributes – Those attributes of, relating to, being, or involving conscious intellectual activity (such as thinking, reasoning, or remembering, cognitive impairment, or based on or capable of being reduced to empirical factual knowledge (Merriam-Webster, 2018).

Communication skills – Skills, whether verbal, nonverbal, written, or electronic exchange, allow for the exchange or delivery of information (Physician Assistant Education Association (PAEA), 2016).

Didactic year - The didactic year is the first year of a PA program, which includes only classroom instruction. Students need to successfully complete the didactic year to move onto the clinical year.

First-time test takers – First time test takers are those individuals who have successfully graduated from an accredited PA program. The national average is based only on the success of

the first-time test taker of the PANCE. Students have a total of six opportunities to pass the national exam.

Interview Instrument – A measurement of noncognitive skills at the time of admission to a PA program. This can include various methods including one-on-one interview, panel interview, or MMI interview.

MMI - A multiple mini interview consists of a series of short, structured interview stations used to assess non-cognitive qualities including cultural sensitivity, maturity, teamwork, empathy, reliability and communication skills (Astroff Consultants Inc., 2018).

NCCPA – The National Commission on Certification of Physician Assistants collaborates with ARC-PA and other national organizations as well as monitors a PA's certification including testing of the PANCE exam.

Non-cognitive skills – Noncognitive skills are those that include empathy, ethical responsibility, oral communication, teamwork, critical thinking, resilience and adaptability, cultural competence, realistic self-appraisal, situational judgment, and professionalism (Brenneman et al., 2018).

PACKRAT – The Physician Assistant Clinical Knowledge Rating and Assessment Tool is considered a practice exam for the national certification exam.

PANCE – The Physician Assistant National Certifying Exam is taken after graduating from an accredited PA program.

Preceptor Evaluation - An evaluation completed by a preceptor on a PA student at the end of the clinical rotation. These evaluations typically consist of questions referring to the PA competencies including: medical knowledge, interpersonal and communication skills, patient

care, professionalism, practice-based learning and improvement, and systems-based practice (PAEA, 2016).

Success - For purposes of this study, success will be defined as favorable outcomes as reported by the program directors on the students' clinical year preceptor evaluations.

Conclusion

Physician assistant competencies have been compiled by the National Commission on Certification of Physician Assistants (NCCPA), the Accreditation Review Commission on Education for the Physician Assistant (ARC-PA), the American Academy of Physician Assistants (AAPA), and the Physician Assistant Education Association (PAEA). These organizations collaborate to insist and ensure that PAs are proficient in these competencies before graduating and entering the workforce in healthcare. Professional competencies include the effective and appropriate application of medical knowledge, interpersonal and communication skills, patient care, and professionalism (PAEA, 2016). The goal of this study is to investigate the experiences that PA directors have with using the MMI as an assessment tool of noncognitive skills during the admission process. The chapters to follow will systematically take the reader through the steps of this research study. In chapter 2, a succinct review of the literature will be provided, followed by methodology in chapter 3, and in chapter 4, an interpretation and analysis of the data used will answer the research questions. Finally, a thorough conclusion with suggestions for future research will be provided in chapter 5.

Chapter 2

Literature Review

To establish the basis for this research study on the experiences that PA directors have with using the MMI as an assessment tool of noncognitive skills in the admission process, this literature review presents current trends in health care as well as the components currently used as admission criteria through physician assistant programs. Included in the literature review is also a background of physician assistant education. Keywords that were used (alone or in combination) for this literature review were: Physician Assistant, non-cognitive factors, PANCE, first time pass success, PA program, predictors, correlation, admission criteria, and multiple mini interview (MMI). Due to the limited number of studies in PA education, studies on higher education assessment and assessment in medical education were included in this review. Databases used included PubMed, OVID, and ProQuest. The majority of resources were considered if the date was after 2000, with two significant resources used even though the date was prior to 2000.

Background of Physician Assistant Profession

The PA profession is one that is expected to increase by 30 percent until the year 2024 (Statistics, 2017). PA programs produce competent PAs who serve the community in various health care specialties and locations. You will find PAs in areas that include family practice, pediatrics, internal medicine, emergency and urgent care settings, obstetrics and gynecology, surgery (general and sub-specialties), psychiatry, outpatient offices and inpatient hospitals, rural and urban areas (AAPA, 2018).

Physician Assistant Programs

One of the goals of any PA program is to accept the most qualified students who will successfully matriculate through the program as well as pass the board exam on the first attempt. Noncognitive skills include empathy, ethical responsibility to self/others, oral communication, teamwork, critical thinking, resilience and adaptability, cultural competence, realistic self-appraisal, situational judgement, and professionalism (Brenneman et al., 2018).

Within PA programs, there is a great deal of emphasis on the first-time pass rate of the Physician Assistant National Certification Exam (PANCE), which is managed by the National Commission on Certification of Physician Assistants (NCCPA). With 23 physician assistant schools in Pennsylvania alone, a vital recruitment tool for programs to be able to report above national average first time pass rates of the PANCE. Noncognitive attributes are not directly tested within the PANCE; however, the task areas require a high level of decision making and problem solving. There are four sections of the PANCE that make up 48% of the exam: cardiovascular, pulmonary, gastrointestinal, and musculoskeletal. In addition, 18% of the test is made up of pharmacology (National Commission on Certification of Physician Assistants (NCCPA), 2017). The NCCPA does not only test content areas, but task areas are also included in the assessment. The task areas are broken down into: History Taking and Performing Physical Examinations (16%), Using Laboratory & Diagnostic Studies (14%), Formulating Most Likely Diagnosis (18%), Health Maintenance (10%), Clinical Intervention (14%), Pharmaceutical Therapeutics (18%), and Applying Basic Science Concepts (10%) (NCCPA, Exam Development and Scoring, n.d.). Although the PANCE does not measure non-cognitive skills, these skills are an important element in PA competencies. Professional competencies include the effective and

appropriate application of medical knowledge, interpersonal and communication skills, patient care, and professionalism (PAEA, 2016).

The most common measure of noncognitive attributes is the interview as part of a program's admission process (Brenneman et al., 2018). Although cognitive attributes are easier to measure, it does not mean that they are more important than noncognitive skills. According to Kulatunga-Moruzi and Norman (2002) additional focus needs to be placed on the success the students achieve once in clinical practice. There is less evidence linking either cognitive or noncognitive variables with success once the students enter clinical practice (Kulatunga-Moruzi & Norman, 2002).

It is argued that the direct admission from undergraduate to graduate healthcare programs is the most important admission within undergraduate programs. Selection for these undergraduate to graduate programs, such as medicine or pharmacy, also implies selection to the respected profession (Rees et al., 2016). According to the Liaison Committee on Medical Education (as cited in Rees et al., 2016), "a medical education program must select for admission medical students who possess the intelligence, integrity, and personal and emotional characteristics necessary for them to become effective physicians" (p. 16). The Association of American Medical Colleges has requested a greater emphasis on personal characteristics and noncognitive skills in the selection of medical students. These personal characteristics and noncognitive skills are the focal point of the admission interview process (Albanese et al., 2003). Cleland et al. (as cited in Rees et al., 2016) argue that personal statements, individual interviews, panel interviews, references, and combinations of the above have all been tried, but found to have low reliability. To overcome these limitations, Eva, Rosenfeld, Reitter, and Norman (2004) developed the MMI based on the principles of the objective structured clinical examination

(OSCE). The MMI rotates applications through a series of stations, with each station designed to assess one or more noncognitive skill (Rees et al., 2016).

Rees et al. (2016) conducted a systematic review of the MMI with the overall purpose to investigate what evidence is available regarding the use of the MMI for selection to undergraduate health programs. The authors reviewed primary research related to the MMI in the admission process for undergraduate health programs including undergraduate medicine, dentistry, veterinary medicine, pharmacy, nursing, rehabilitation, therapy and hygiene, and allied health sciences (including physician assistant). In their results, Rees et al. (2016) discuss that no study explicitly mentions any negative consequences of adopting the MMI into the admission process. The MMI "appears to have reasonable validity, reliability, and acceptability" (Rees et al., 2016, p. 453).

Trends in the Research

With 239 accredited PA schools in the United States, recruitment of the most qualified candidates is crucial (PAEA, 2018). The trend in the PA profession is projected to increase in providers by almost 30% over 10 years (2014-2024) (Statistics, 2017). According to NCCPA (2018) there are more than 123,000 PAs in the active workforce. By using a simulation model that incorporated historical trends and current graduation rates, a sensitivity analysis was conducted to determine the projected increase. When taking retention into account, it was reported in 2009 that 82% of those that graduated from a PA program were clinically active (NCCPA, 2018).

Noncognitive Skills

According to Farrington et al. (2012), noncognitive skills are actually a better predictor than cognitive skills for successes in life and academics. New research has suggested that the PA

profession should transition to giving more weight to noncognitive skills in the admission process (Farrington, et al., 2012). It is believed that the PA profession has the opportunity to improve and advance the admission process by re-weighting noncognitive skills when choosing who will be a successful student and, furthermore, a successful clinician (Brenneman et al., 2018).

According to Sedlacek (2011), grades have become less of a predictor or indicator of student success. It is thought that this trend is due to grade inflation, and this situation is forcing educators to look at other variables to determine the readiness of a student to be admitted to a PA program. The argument continues that the field needs a measurement that is fair to all that can provide educators with a good assessment of the development and learning needs of the students. Assessing noncognitive skills is considered to be an alternative assessment that is fair and useful to all students (Sedlacek, 2011).

Both researchers and professionals agree that the two overarching contributions to high quality medical care and patient satisfaction are technical competence and empathic care (Woodham & Leaven, 2017). Woodham and Leaven (2017) predicted that "customer satisfaction and loyalty will depend more on warmth than competence, but the reputation for medical care will depend more on his/her competence" (p. 272). The authors used a sample of 250 patients/respondents who were asked to indicate their level of loyalty to their doctor. Then the participants were asked to read attribute definitions based on SERVQUAL, a multi-dimensional research instrument that is designed to capture both consumer and preceptor expectations along five dimensions: reliability, assurance, tangibles, empathy, and responsiveness (Parasuraman, Zeithaml, & Berry, 1988). After reading the definitions, respondents were asked to rate their

doctor on a seven-point Likert scale with one being terrible and seven being excellent. Woodham & Leaven (2017) concluded that:

> Doctors who neglect the empathic element of care, and overemphasize clinical competence, may have superior reputations, but have dissatisfied patients who are less loyal, and less inclined to have routine annual checkups. On the other hand, doctors who display high warmth, and relatively low clinical competence, will have lower reputations, but could have more satisfied and loyal patients. (p. 273)

In a study conducted by Al-Amin and Makarem (2016), the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey and American Hospital Association data were used to determine patients' ratings of physician communication at the hospital level as well as to collect information about hospital-level factors that could possibly have influence in the way physicians communicate with their patients. Patient perceptions and overall rating of their hospital experience have become vital indicators of overall hospital performance. According to Al-Amin and Makarem (2016), as the healthcare in the United States has moved toward value-based purchasing (VBP), financial incentives are often given to hospitals that improve and maintain their HCAHPS scores. The authors used a sample of 2,756 hospitals and ran a regression analysis to determine what can be used as predictors of poor physician communication by measuring the percentage of patients in a hospital who reported that their physician either sometimes or never communicated well. The regression analysis results indicated that the findings were in fact significant. Results included evidence that, in the best-performing hospitals, no patient reported that the physician sometimes or never communicated well; however, 21% of patients in the worst-performing hospitals reported that physicians either sometimes or never communicated well. According to Al-Amin and Makarem (2016) "given the

impact that VBP could have on hospital financial performance and the impact that public reporting could have on patients' choice of hospitals, patient satisfaction with physician communication is a key improvement area for hospitals" (p. 36).

As discussed by Middleton (2008), it is important that the admission selection criteria to physician assistant programs be reliable and valid in discriminating individuals who have the knowledge, abilities, and experience to succeed. One study completed by McDaniel, Thrasher, and Hiatt (2013) examined noncognitive skills in the admission process including career motivation, knowledge of the PA profession, maturity, and professionalism and how they relate to students who matriculate in the PA program. The study concluded that future research could study a correlation of these noncognitive skills to overall academic success and success on the PANCE. In addition, the study concluded that the most influential, noncognitive factor was career motivation (McDaniel, Thrasher, & Hiatt 2013).

Multiple Mini Interview

Interviews are used to serve four purposes: information gathering, decision making, verification of application data, and recruitment. Interviews can be semi structured (traditional model) or structured. One example of a structured interview is the MMI. The MMI is reported to assess non-cognitive skills such as ethical reasoning, oral communication, and problem evaluation (Oliver, Hecker, Hausdorf, & Colon, 2014). Validation studies have been conducted with total MMI scores to test the relationship between MMI scores and personality characteristics as well as prediction of MMI scores with relation to future performance in practice (Oliver, Hecker, Hausdorf, & Colon, 2014). Study results can assist with the development of MMI in programs that are not currently using this interview instrument. Results

can assist with development of the MMI stations, rater training, score interpretation, and resources allocation (Oliver, Hecker, Hausdorf, & Colon, 2014).

It is important for the research of healthcare programs to consider how a personality assessment can be included as part of the admission process, and in a study conducted by Griffin and Wilson (2012), the researchers investigate whether the MMI is related to the five-factor model of personality. The five factors of personality are defined as conscientiousness, extraversion, agreeableness, neuroticism, and openness to experience, and each of these possesses a number of sub-factors (Griffin & Wilson, 2012). In this study, the researchers' sample was applicants for entry into an Australian school of medicine from the years 2006-2008. This sample was chosen to participate in the MMI based on their high school academic performance as well as their score in the Undergraduate Medical and Health Science Test (UMAT), a cognitive test used by medical schools across Australia and New Zealand. The MMI consisted of nine stations, each testing a different skill or ability. The sample also participated in a personality test where a 120-item scale from the International Personality Item Pool was used to measure the five factors of personality. MMI scores were correlated with the personality traits, samples from the three years were examined separately in order to cross validate the results, and a multiple regression analysis was done to "investigate the influence of the factor-level personality variable on MMI scores, controlling for cognitive ability variables" (Griffin & Wilson, 2012, p. 381). The authors concluded that there is an association between MMI scores and personality. In addition, they concluded that the strength of the relationship does not support personality tests as a screening tool for MMIs (Griffin & Wilson, 2012).

The MMI is also considered to be useful to programs and program directors as it offers a more defensible, reliable, and valid approach to the admission process (Lemay, Lockyer, Collin,

& Brownell, 2007). In 2006, 281 applicants to the University of Calgary Medical School were assessed. All applicants were interviewed using the MMI and the study was conducted to test if there were significant differences in interview scores among those students who had been accepted and those who were offered a waitlist seat (Lemay, Lockyer, Collin, & Brownell, 2007). The applicants were assessed on the criteria of ability to understand and address the objectives in the scenario, communication skills displayed, strength of the arguments presented, suitability for a career in medicine, and overall performance. The results determined that the MMI could distinguish between applicants that were accepted and those that were placed on the waitlist. In addition, the MMI was described as a fair and defensible assessment tool since it is not associated with sociodemographic (Lemay, Lockyer, Collin, & Brownell, 2007).

In a study conducted by Knorr and Hissbach (2014), the authors reviewed literature regarding the MMI and the aspects of the interview's design to find the "impact on the reliability, validity, and cost-efficiency of the format" (p. 1157). The authors explained that there are an increasing number of medical field programs that are using the MMI because of its reliability values and reduction of interview bias. Knorr and Hissbach (2014) analyzed 66 publications, found using OVID, PubMed, and Web of Science, in which the MMI and related interview approaches were discussed. Forty studies reported reliability values and it was concluded that the number of stations has a larger impact on reliability as opposed to raising the number of raters per station. Additional positive influences included the exclusion of stations that would be considered too easy, the use of normative anchored rating scales, and training provided to the rater prior to conducting a station. Thirty-one studies reported data on criterion-related validity as well as analyses of dimensionality, concluding that "irrespective of design differences, the relationship between MMI results and academic measures is small to zero"

(p. 1157). Seven publications offered information on the required resources as well as some cost-saving measures, with the most relevant costs being station development and payment to actors assisting with the stations. The authors also concluded that some important aspects of the MMI have not yet been explored and more theory-driven research would be beneficial (Knorr & Hissbach, 2014).

According to Kreiter, Yin, Solow, and Brennan (2004), "existing literature does not provide sufficient evidence regarding interview reliability" (p. 157). It is thought that validation of decision reliability can help to provide the guidance needed to integrate interviews into the admission process (Kreiter, Yin, Solow, & Brennan, 2004). MMI interviews typically demonstrate the desired reliability and validity that panel interviews are lacking (Griffin, Auton, Duvivier, Shulruf, & Hu, 2018).

To address reliability and validity of the MMI, rater training needs to be considered. According to Eva and Sebok (as cited in Rees et al., 2016), rater training is an area that is crucial and needs development in order to improve the reliability of the MMI. In addition, according to Griffin and Wilson (as cited in Rees et al., 2016), when trainings changed from information based to skills based training that included rating simulated interviews "the proportion of variance in their MMI scores attributable to difference between rater was reduced from 20.2% to 7.0%" (Rees et al., 2016, p. 449). In a study conducted by Roberts et al. (2008) the authors disclose that their raters had received very little specific training for their role as an examiner in the MMI. The only training provided was a one hour workshop and written material. It is concluded that rater training "would be beneficial in reducing error related to interviewer subjectivity" (Roberts et al., 2008, p. 401).

In the study conducted by Griffin, Auton, Duvivier, Shulruf, and Hu (2018), the authors attempted to ascertain if MMIs are multidimensional or unidimensional. In addition, they also attempted to determine if MMIs, conducted at different institutions, assess the same or different constructs to each other and also to panel interviews. Participants in this study were those who were shortlisted for interviews from three different medical degree-offering institutions. Two institutions used the MMI and the third used a panel interview. The results of this study indicated that the panel interviews are designed to measure one underlying dimension rather than a set of clear dimensions and that the two institutions that used the MMI showed a degree of similarity, suggesting they are assessing the same dimension. The institution with the panel interview showed a distinct difference from the institutions that used the MMI (Griffin, Auton, Duvivier, Shulruf, & Hu, 2018).

In a dual cohort, observational, comparative study conducted by Jones and Forister (2011), a comparison was done regarding the use of a behavioral interview with that of the MMI format to measure desired noncognitive behaviors. A polytomous rating scale was used to analyze the results that were collected from two homogeneous groups of PA program applicants (total N = 176). One group (N=93) went through two, 20-minute, behavioral interviews and the second group (N=83) completed the MMI, which included ten separate, seven-minute stations. The results state that the behavioral interview did not adequately measure differences in the applicants' characteristics, but the MMI did measure more variation in noncognitive skills. Jones and Forister (2011) concluded that the MMI was in fact a more reliable format to measure professional potential and organizational fit when compared to the behavioral interview format.

In a cross-sectional observation study with statistical support conducted by Rauf, Tayyab, and Masrur (2018), student performance in communication skills in the MMI was compared with

student performance in communication skills in their first Integrated Physical Examination (IPE), which was taken at the end of the first block at Shifa College of Medicine. The researchers used Pearson's Correlation to calculate descriptive statistics for student demographics, scores in communication skills in the MMI, and scores in communication skills in the IPE. The researchers indicated that a p-value of ≤ 0.05 was taken as significant, and in their findings the relationship between communication skills in the MMI and communication skills in the IPE had a statistically significant positive correlation with a p-value ≤ 0.001. The researchers concluded that "student performance shows a positive correlation in non-cognitive skills between the Multiple Mini Interview and Integrated Practical Examination" (Rauf, Tayyab, & Masrur, 2018, p. 270).

Cognitive Skills

There is emphasis on clear and defined assessments as set forth by the Accreditation Review Commission on Education for the Physician Assistant (ARC-PA) for all PA programs. Decisions are to be data driven. As ARC-PA does not specify or define a method for assessment, the commission expects programs to develop and manage their own assessment tools. Some trends have been identified as common among programs. It is safe to say that all programs develop a process of formative assessment, including diagnostic testing and informal assessment conducted by the instructors, with the goal to modify classroom instruction as well as instructional activities (Andrade, 2010).

Many studies have been conducted to determine the relationship between pre-professional academic performance and professional academic performance. These studies examined relationships between GPAs and performance on US Medical Licensing Examinations. A high degree of correlation is typically found (Kulatunga-Moruzi & Norman, 2002).

Furthermore, in PA research, studies have confirmed the relationship between academic admission criteria and performance on the PANCE (Brenneman et al., 2018).

Conceptual Framework

Growing evidence suggests that noncognitive skills play a critical role in patient outcomes (Brenneman et al., 2018). Patient satisfaction is assessed during the students' clinical year, where there is direct patient care provided by the student, under the clinical preceptor's guidance and supervision. Researchers and clinicians suggest that greater patient outcomes can be achieved if health science research was directed by the following five principles:

1. Needs of patients and populations determine the research agenda
2. Research agenda addresses contextual and implementation issues, including development of delivery and accountability systems
3. Research agenda determines the research methods rather than methods determine the research agenda
4. Researchers and clinicians collaborate to define the research agenda, allocate resources, and implement findings
5. Level of funding for implementation research is commensurate with and proportional to the magnitude of the task (Kottke et al., 2008).

In a study examining how the current model of primary care in the United States limits a physician's ability to offer high-quality care, Solberg's (2007) conceptual framework of improving medical practice guided the research. This study conducted semistructured interviews with 136 individuals and seven focus groups in 20 small- to mid-sized medical practices in Pennsylvania. The purpose was to show that the patient-centered medical home model shows promise in addressing provision of high-quality care. Solberg's (2007) conceptual framework

was integrated because implementing this practice model required a comprehensive organizational change. This study provided a list of change strategies for facilitating and transforming the patient-centered medical home model into primary care. It also incorporated Solberg's (2007) framework to include "buy-in" as a necessary condition during the change process (Bleser et al., 2014).

Conclusion

This literature review provided background on the PA profession and PA programs, current trends in the research with respect to noncognitive skills, the MMI, cognitive skills, as well as how another study has incorporated Solberg's (2007) conceptual framework. Prior research supports this study being conducted on the influence of noncognitive skills in PA education and this researcher's study will help to guide future research. As mentioned above, there is limited research on noncognitive skills and the role they play on matriculation in a physician assistant program through clinical practice.

Chapter 3

Methodology

A qualitative study was conducted to investigate the experiences that PA directors have with the MMI as an assessment tool of noncognitive skills during the admission process. The design of this research was qualitative phenomenology theory with a systematic design and aligned with Solberg's (2007) conceptual framework of improving medical practice. There is the potential for a cultural change in which PA programs transition the focus from a primarily cognitive-focused admission process to one that is more holistic and puts equal focus on noncognitive skills.

The research questions were used as a guide to investigate the experiences PA directors have had with applying the MMI as a measure of noncognitive skills:

- What are the experiences of PA directors using the MMI as an admission evaluation tool?
- Based on the outcomes of the clinical year preceptor evaluation, what experiences have PA directors had with the MMI as a method to assess an applicant's noncognitive skills?
- What experiences have PA directors had with well-developed noncognitive skills contributing to improving medical practice?

Phenomenology is based on the work of the philosopher Edmund Husserl (Center for Innovation in Research and Teaching (CIRT), n.d.). It is a widely accepted research tool used to describe human experiences and to describe how humans experience a certain phenomenon. A study using a phenomenological approach attempts to set aside biases and preconceived notions as well as allowing the researcher to investigate perceptions, perspectives, and feelings of those that have actually experienced the situation of interest (CIRT, n.d.). According to CIRT (n.d.), the following is a list of main characteristics of phenomenology research:

- It seeks to understand how people experience a situation.
- It is conducted through in-depth conversations and interviews.
- Typically there is a small sample size (10 or less participants).
- Interview questions are left open-ended to allow interviewees the freedom to fully describe their experience.
- It is centered around the interviewee's experience, with no regard to social or cultural norms, traditions, or preconceived notions.
- Data collected is qualitative and analysis includes identifying themes regarding an experience.

Qualitative interviews allow the researcher to understand a phenomenon (Guastella, 2009). According to Guastella (2009), qualitative interviews can also "promote an understanding of how participants interpret the events in their lives as well as provide a method of bridging subjectivities by helping the reader identity with the participants and their experiences" (p. 96). In this case, the interviews allowed this researcher to investigate the experiences that PA directors have had using the MMI as an assessment tool for noncognitive skills during the admission process.

A phenomenological approach was chosen as this researcher was investigating the experiences PA directors have had with applying the MMI as a measure of noncognitive skills. This approach allowed the researcher to investigate the experiences that PA directors have with using the MMI as an admission evaluation tool. According to Guastella (2009), phenomenological research allows the researcher to identify the meaning of human experiences regarding a particular phenomenon. A phenomenological approach uses experiences to obtain comprehensive descriptions which provide the basis for a reflective structural analysis

(Moustakas, 1994). This theory and approach enable "the development of detailed descriptions so that the researcher can learn as much as possible about an event or phenomenon that the researcher did not experience first-hand" (Guastella, 2009, pp. 95-96). This researcher was admitted to an accredited physician assistant program, successfully completed a master of science in physician assistant studies, and has also had a career as a program director in PA education. However, this researcher did not participate in an MMI admission process as a student or use the MMI as an assessment tool of noncognitive skills during the admission process as program director. By conducting interviews to address the experiences of PA directors, this researcher was able to obtain multiple perspectives. The phenomenological theory aligned with the study which is investigating the experiences that PA directors have had with how noncognitive skills contribute to a physician assistant student's success during clinical year. The following study further examines how the phenomenological approach addressed noncognitive skills within the medical field, and also successfully aligned with the approach used in this dissertation.

A qualitative phenomenological investigation was conducted using patient experiences of doctors being uncaring in order to guide and invigorate doctors to reintroduce caring to their patients (Gillespie et al., 2018). Ten patients with broad healthcare experiences were chosen to be participants. These patients relayed their uncaring and caring experiences and verbatim transcripts were analyzed using template analysis. The results showed that caring doctors were genuine and they made patients feel recognized as individuals, not just by their disease. The caring from the doctors empowered the patients to be actively involved in their own healthcare decisions. The study concluded that "these findings provide medical educators with an interpretation of caring that is truly patient-centered. Coupling technical proficiency with human

qualities - being genuinely empathic and respectful - within doctor-patient relationships is the essence of caring" (Gillespie et al., 2018, p. 1062). This study supports that phenomenology theory was the appropriate choice for this research.

A comprehensive literature review of noncognitive skills in physician assistant admission processes, as well as the MMI type interview in health care programs, revealed that experiences using the MMI and how it impacts student outcomes in terms of the preceptor evaluation are limited and need further investigation. The experiences of PA directors with the MMI was chosen for this research with this phenomenon being significant to PA educators, PA preceptors, and PA students.

Phenomenological research using Moustakas' (1994) approach was used to describe the meaning of the PA directors' experiences with the MMI and how the MMI worked as an assessment tool of noncognitive skills during the admission process. Moustakas' (1994) approach consists of the following steps: identifying a phenomenon to study, bracketing out the researcher's own experiences, and collecting data from people who have experienced the phenomenon. The process is then followed by data analysis and reducing the information to important statements and quotes. The statements and quotes are then combined into themes. To convey an overall essence of the experience, the researcher develops a textural description (the actual experience) and a structural description (the conditions, situations, or context) in which the experience occurred (Moustakas, 1994).

This researcher began by using epoche or bracketing to identify preconceived notions or biases related to the phenomenon. Six interviews were conducted to collect data from PA directors who have experience with the phenomenon studied in this research. The interviews were recorded and transcribed to facilitate several reviews of the transcripts about the

experiences of the PA directors. Phenomenological reduction occurred after the transcription of each interview in order to create the textural and structural descriptions. Lastly, imaginative variation was used to develop the structural descriptions of the phenomenon. According to Moustakas (1994) the steps of imaginative variation are as follows:

1. Systemic varying of the possible structural meanings that underlie the textural meanings;
2. Recognizing the underlying themes or contexts that account for the emergence of the phenomenon;
3. Considering the universal structures that precipitate feeling and thoughts with reference to the phenomenon;
4. Searching for exemplifications that vividly illustrate the invariant structural themes and facilitate the development of a structural description of the phenomenon.

This researcher integrated the textural and structural descriptions of the phenomenon in order to reveal the underlying meaning of the research topic.

Setting

With the focus of PA program admissions currently that of a cognitive one, a shift in focus to include noncognitive skills has the potential to cascade to greater patient satisfaction once the PA is working in clinical practice (Brenneman et al., 2018). The setting of this research was continued or provisional accredited physician assistant programs that conduct interviews using the MMI interview style in the admission process. This researcher interviewed PA directors as the participants. These PA directors were from PA programs that run 24-27 months

in duration and put focus on physician assistant competencies as set forth by the NCCPA, PAEA, ARC-PA, and AAPA.

Participants

Participants were chosen through purposeful sampling, specifically homogeneous sampling of PA directors who have experience with the MMI as part of the admission process. Purposeful sampling allows intentional selection of individuals who can provide insight and understanding of the overall research topic (Creswell, 2015). PA directors from across the country that are known to this researcher for using the MMI as part of their admission process were contacted directly by this researcher to request an interview. The participants voluntarily shared their non-identifiable data with this researcher for the sole purpose of this doctoral dissertation. Results of the study were shared with all participants, and they will be able to adjust their current admission interview process, curriculum, or preceptor evaluation, based on the results, as they find it necessary. The range of participants was to be 5-10 in alignment with standards for this qualitative research process.

Type of Data

The data collected was qualitative in nature using a phenomenological approach. To obtain the purposeful sampling of participants, PA directors from across the country who are known to this researcher for using the MMI as part of their admission process were contacted directly by this researcher to request an interview. Once PA directors who are willing to be interviewed were identified, this researcher used Zoom to conduct a one-on-one interview in which further investigation was conducted on 1) Why the program chose to use the MMI and what is the program's experience with using the MMI? 2) How long has the program been using the MMI? 3) What is the program's experience in providing rater training prior to conducting the MMI? 4) Has using the MMI as the program's interview instrument changed/affected outcomes

of the students' preceptor evaluations? 5) If noncognitive skills are important enough to consider upon application, how does the PA program further support development of noncognitive skills, and what is the program's experience with doing this? 6) Did the PA program require a revision in its curriculum to meet the expectations of the noncognitive skill competencies as set forth by the MMI? 7) What has been the overall experience of using MMI? 8) Have PA directors made changes to their admission process as a result of implementing the MMI? 9) Does the PA director's program teach, or in some way positively influence, a student's non-cognitive skills?

These questions reflect the phenomenological approach to this qualitative study; the five-step process as described by Creswell (2015), were used to collect and analyze the data:

Step 1 –Seven participants were identified through purposeful sampling, that were able to contribute to the purpose of the research.

Step 2 – Permissions were obtained to begin the research including permissions from the designated Institutional Review Boards (IRB). (Appendix B)

Step 3 – Data was collected through semi-structured one-on-one interviews that were conducted using Zoom, a video communication platform, at an agreed date and time that was convenient to participants. Each interview lasted approximately 30-45 minutes in length.

Step 4 – Interviews were recorded in a private setting, using the Zoom platform in order to organize and transcribe the information provided by the participants. Participants were notified prior to the interview that the conversation were to be recorded using Zoom, and the participants' permission was obtained prior to recording. Zoom provided end-to-end encryption for all meetings, role-based user security, and password protection (Zoom Video, 2019). When recorded to the researcher's laptop, Zoom was able to transcribe the

interview (Zoom, 2019). Coding of the data followed the steps as recommended by Creswell (2013) and Tesch (1990) as follows:

1. Get a sense of the transcripts as a whole and make notes while reading through the transcripts.
2. Pick one of the interviews and make notes of the underlying meaning.
3. Identify text segments and use brackets to separate this text from the document. Give these segments a specific code work that can be used to describe the meaning of the text.
4. Once all the text is coded, make a list of all code works and group similar codes together.
5. Take this list and return to the data to see whether any new codes emerge.
6. Reduce the list of codes to achieve five to seven themes of the participants and the phenomenon.

Step 5 – Sensitivity to challenges and ethical issues was maintained while collecting data. The participants remain anonymous and any identifiable information was excluded, including name and associated PA program, college or university. Pre-assigned pseudonyms were used during the interview to protect the participant's anonymity and this researcher requested that the participants only use those pseudonyms during the interview.

Analysis

Phenomenological analysis required this researcher to explore personal experiences in order to be aware of personal prejudices, viewpoints, and assumptions. These prejudices and assumptions were then bracketed in order to fully analyze the experiences of the participants.

Early on, horizontalization was used to examine all the data with equal value. The data was then organized into themes and experiences were linked (Merrian & Tisdell, 2016). According to Bloomberg and Volpe (2016), in a phenomenological study, the researcher is analyzing the data for significant statements that can be grouped together. The goal of this process was to produce an exhaustive description of the phenomenon by developing meaning to the themes.

With the phenomenological design, analysis began early while data continued to be collected. This researcher chose the Modified Stevick-Colaizzi-Keen method (Appendix C) because the phenomenon being studied is this researcher's personal passion (CIRT, n.d.). Analysis followed a four-step model. Step one was bracketing, in which any preconceived opinions were identified. According to CIRT (n.d.), bracketing is important because it is the process of isolating the phenomenon and separating it from what is already known. Step two was intuition, which required that this researcher become totally immersed in the study and remain open to the meaning of the phenomenon as described through the PA directors' experiences. Step three was analysis, in which this researcher developed themes that can be used to describe the experiences from the perspective of the PA directors. Step four was description, where this researcher's understanding of the data was used to describe the phenomenon in order for it to be communicated to others (CIRT, n.d.).

Participant Rights

Prior to participating in the study, each designee from his/her respective physician assistant program signed an acknowledgement form indicating informed consent (Appendix D) and willingness to participate in the voluntary study. The informed consent form was in accordance with the University of New England Human Subject Review Board for the protection of Human Subjects. Participants were emailed the interview questions approximately one to two

weeks prior to the scheduled interview. During this time, participants had the opportunity to research their students' performance during clinical year. This ensured that participants were providing reliable information. Participants were asked to not provide any student identifiable information, but to speak in general terms regarding clinical year performance. Member checking was conducted after the transcription to ensure validity. Transcripts were sent via email to all participants to give them the opportunity to make corrections and verify accuracy. Participants were notified that all data collected is kept on a password protected laptop and backed-up on an external hard drive that will be kept in a locked cabinet in this researcher's home office, in which only this researcher will have access. All transcripts, data and records will be kept for three years after initial publication. The participants also had the right to withdraw from the study at any time.

Potential Limitations

The largest limitation of this study includes response bias. Directors willing to be interviewed by this researcher were from programs where leaders already feel strongly about the importance of noncognitive skills. Some PA programs may "teach" noncognitive skills; therefore, the score of noncognitive skills at the time of preceptor evaluations would also be influenced by the didactic year curriculum. The Hawthorne effect may occur simply because participants are being interviewed via a video platform, and their reactions may be altered simply because of their awareness of being observed. There is a limitation in the range of preceptor evaluations and correlated scores that are used by PA programs, with the majority developed by the program itself. This was limiting, as there will not be continuity or consistency in the preceptor evaluation scores that are being evaluated. This research is qualitative in nature,

therefore cannot be tested for statistical significance. Finally, this research did not assess alternative methods used to assess noncognitive skills.

Conclusion

The phenomenology theory of qualitative methodology was used to investigate the experiences of PA directors with the MMI as an admission evaluation tool. It was also used to investigate the experiences PA directors have had with the influence that noncognitive skills have on student success during clinical year, and if their experiences have determined that noncognitive skills do have an influence on improving medical practice. Chapter Four will provide an interpretation and analysis of the data and Chapter Five will provide an overall conclusion and suggestions for future research.

Chapter 4

Results

The purpose of this qualitative phenomenological research study was to investigate the experiences that PA directors have with applying the MMI as a measure of noncognitive skills. This study addresses the questions:

- What are the experiences of PA directors using the MMI as an admission evaluation tool?
- Based on the outcomes of the clinical year preceptor evaluation, what experiences have PA directors had with the MMI as a method to assess noncognitive skills?
- What experiences have PA directors had with well-developed noncognitive skills contributing to improving medical practice?

In this study, participants were defined as directors of PA programs that run 24-27 months in duration and the program focus on physician assistant competencies as set forth by the NCCPA, PAEA, ARC-PA, and AAPA. A qualitative phenomenological method with a systematic design that aligned with Solberg's (2007) conceptual framework of improving medical practice was applied to the data. The data was derived from transcribed Zoom interview of a purposeful sample of six PA directors. Participants were invited to voluntarily participate and signed an informed consent form prior to the interview. Chapter Four is an explanation of the steps used to review and analyze the data and a discussion of significant themes.

Analysis Method

The phenomenological qualitative method was chosen as this researcher is investigating the experiences PA directors had with applying the MMI as a measure of noncognitive skills. According to Guastella (2009), phenomenological research allows the researcher to identify the

meaning of human experiences regarding a particular phenomenon. A phenomenological approach uses experiences to obtain comprehensive descriptions which provide the basis for a reflective structural analysis (Moustakas, 1994). This theory and approach enable "the development of detailed descriptions so that the researcher can learn as much as possible about an event or phenomenon that the researcher did not experience first-hand" (Guastella, 2009, p. 95-96). By conducting interviews to investigate the experiences of PA directors, who did have experience with the MMI, this researcher was able to obtain multiple perspectives regarding the MMI as an admission tool to assess applicants' noncognitive skills. The phenomenological methodology was appropriate for a study investigating the experiences that PA directors have had with how noncognitive skills contribute to a physician assistant student's success during clinical year.

Participants were identified through purposeful sampling. PA directors from across the country who are known to this researcher for using the MMI as part of their admission process were contacted directly by this researcher to request an interview. Prior to conducting any of the interviews the researcher received a signed, informed consent form via email (see Appendix D) from the PA directors who agreed to be interviewed. The interview questions (see Appendix E) were provided to each participant about one week prior to the scheduled interview. This allowed the participants to research their students' performance during clinical year in order to ensure that reliable information was being provided to the researcher. The interview questions sought to create a greater understanding of the experiences that PA directors have had with applying the MMI as a measure of noncognitive skills. Of the seven PA directors contacted, 6 PA directors agreed to participate in the interview process and all six were interviewed by the researcher.

Participants were told that the interviews would take approximately 30 - 45 minutes, with the actual length depending on the participants' answers to the open-ended questions.

To manage the data and ensure the confidentiality of each study participant, pseudonyms were assigned to each participant prior to the interview. This ensured that each response was anonymous and any identifiable information remained private. The demographic information of each participant is displayed in Table 1.

Participant	Pseudonym	Program Accreditation	Years of Using the MMI
Participant 1	Carly	Provisional	3 years
Participant 2	Ryan	Continued	1 year
Participant 3	Jason	Provisional	1 years
Participant 4	Laura	Continued	6 years
Participant 5	Michael	Continued	3 years
Participant 6	Jocelyn	Continued	5 years

Table 1

The researcher used the Modified Stevick-Colaizzi-Keen method for analysis of the study results, because the phenomenon being studied is the researcher's personal passion (CIRT, n.d.). Analysis followed a four-step model. The first step was bracketing, in which any of the researcher's preconceived opinions were identified. This helped put personal experiences aside in order for the researcher to focus on the study (Schmidt, 2015). Putting personal experiences aside enabled the researcher to become totally immersed in step two of the study, and to remain open to the meaning of the phenomenon as described through the participants' experiences. In

step three, the researcher developed themes to describe the experiences of the participants. Textural descriptions of "what" each participant experienced followed by a structural description of "how" the experiences were related to the phenomenon were recorded. The textural and structural descriptions were then combined to form a textural, structural essence of the experience (CIRT, n.d.). In step four, the researcher's understanding of the data was used to describe the phenomenon in order for it to be communicated.

Moustakas's (1994) modified Stevick-Colaizzi-Keen method of data analysis was used to complete the data analysis process. Each of the following subsections will describe the processes used to analyze the data.

1. Each participant's statement was considered with respect to significance for description of the phenomenon.
2. Each participants' relevant statements were recorded.
3. Each nonrepetitive, non-overlapping statement was listed for each participant. These statements were the meaning units of the experience.
4. Meaning units were related and clustered into themes for each participant.
5. A textural description for each participant was developed. The description synthesized the invariant meaning units and themes and included supported verbatim examples.
6. A structural description was developed for each participant using imaginative variation and reflection of the textural descriptions. Verbatim statements were used to help support the description statements.
7. Textural-structural description of the essences and meaning were constructed for each participant.

8. A composite textural-structural description of essences and meaning from all participants was completed. This composite formed the universal description of the experiences that represented all participants.

As the researcher completed each interview, patterns began to emerge. The underlying meaning of the participant's responses were parallel. All statements were based on the personal experience of each individual participant. At the conclusion of the six interviews, the researcher had a general idea of what themes would further emerge in the data analysis. The transcribed interviews were reviewed and coded for patterns of repeated phrases, repeated words, and repeated thoughts that referenced the phenomenon. Significance statements or horizontalization were listed and they are a part of the reduction process. If statements were repeated or did not pertain to this study, then they were eliminated. Through elimination, what remained were considered the horizons of the experience.

The researcher turned the themes into a description of the experience using verbatim examples. The researcher repeated this process for each participant for all the interviews. Once all participants completed an interview, the researcher combined the textual-structural descriptions that represented the essence of all the participant's experiences using the MMI as a measure of noncognitive skills. As the researcher completed each interview, a pattern of similar statements began to emerge. The underlying meaning of the participant's responses were parallel. All statements were based on the personal experience of each individual participant. The researcher then developed a list of themes.

Presentation of Results

Thematic Patterns Derived from Interviews

Six themes were identified as a result of the qualitative data collection. The following section presents these six themes. The themes are supported by verbatim quotes that were provided by the participants.

Thematic Finding 1: Holistic Review

Interview evidence suggested that one of the main reasons the MMI was chosen by the program to be used as a measure of noncognitive skills was because of its holistic approach. Participants mentioned that this approach also contributed to standardization. This researcher was interested in why the PA directors' program currently used the MMI and what the program's experience was with using it. Statements that supported a holistic review included:

- "I felt that the MMI was a better way to get at what we were looking for in terms of trying to do some more behavioral type interviews, in terms of trying to do a more holistic interview as well."
- "We tried traditional interviews, and people seem to like that, but the questions were not standardized. The first step was really trying to identify what it is we wanted to measure in the MMI. We started to poll the faculty and ask them what characteristics would they like to see assessed in the MMI, which we haven't been assessing, at least, standard wise across with the traditional interviews. So we came up with a list of about 20 words, everything from resilience, grit, attitude, perseverance, and empathy."

- "We have a list of values that include things like integrity, leadership, maturity, communication, and you certainly might be able to pull out some of that in a traditional interview, but not all of it and not in a standardized way."
- "One of the reasons I think it [the MMI] is probably a better interview technique, one of the many, is that rather than asking those questions that you know can easily be answered by just looking at the applicants' packet, you can look at those cognitive and noncognitive skills. While I do not think any interview process is perfect, I do think that the MMI gets you closer to really knowing who the applicant is and how they critically think and maybe how they will perform in the program."
- "Research showed some clear evidence that the MMI was able to get, at least a higher level, than the standard interview process would be to those core issues that we were struggling with; things around professionalism, ethics, emotional maturity, desire to help people and those kinds of things. We really liked the program, really liked the outcomes that the MMI was demonstrating, so that is what brought us to implementing the MMI at our institution."
- "We feel that the MMI is a better opportunity to get the real person instead of just a rehearsed version of that person."
- "The MMI just further allows that holistic review of getting to really know the person versus just grades, stats, and numbers."
- "We tried the traditional interview, and people seem to like that, but one of the things that we felt was a little unfair to applicants was that when we would set up an interview panel, there were two faculty, and then each panel would have two or three

students come in for an interview. The questions were not standardized…the applicants weren't getting the same experience."

Thematic Finding 2: Rater Training Consistency

Participants acknowledged that, when employing raters other than PA program faculty to conduct the MMI, training on the MMI tool and interviewing skills was crucial to ensure fairness and consistency. One participant commented that he or she permits outside raters to participate and provide feedback, but the scores they provide to the interviewee do not get factored into the candidate's overall score. Participants expressed that this was an area upon which their program could improve. This researcher was interested in what the PA directors' experience was with providing rater training prior to conducting the MMI. Statements that supported the importance of rater training included:

- "I try very hard to make sure that the same people are running the same station each time. We do try to work very hard with them [the raters] before they start the day and remind them what they need to do. I think that has been one area where we probably have room to improve along the way."
- "We had people practice creating scenarios and by doing that, that really gave them insight then on how to rate it. The people that wrote the scenario were the ones doing the training on whoever was going to staff that scenario or read that scenario if it wasn't themselves that wrote that station. We don't want them to introduce any bias and we don't want them asking the applicant other questions beside the scenario, in order for the applicants to have the same experience."
- "I wanted training development and I wanted it to come off smoothly. We held a two-day workshop with the faculty and staff to talk about the MMI process operationally."

- "We wanted consistency throughout. It's important for us to learn from our historical perspective and you learn from retrospect that you really want the same interviewers, if at all possible."
- "We did training for our faculty and our program administrator trains all of our outside interviewers."
- "Anyone who is new to the process needs to go through a formal MMI training. I am also creating a refresher course for everyone, whether they have gone through the training before or not, because I feel like we need to get them back on track."

Thematic Finding 3: Development and Reinforcement of Noncognitive Skills

Participants stressed the importance of using objective structured clinical examination (OSCE) and scenarios for continued development and reinforcement of noncognitive skills. This researcher was interested in how the PA directors' programs support the further development of noncognitive skills of the students and what their experience is in offering and supporting this development. Statements that support the importance of continued development and reinforcement of noncognitive skills include:

- "I think the most tangible way we do it [further support the development of noncognitive skills] is we do a lot of OSCEs at our program from the very beginning."
- "I think we do that in a variety of ways, and work with the students to kind of develop a lot of those soft skills or at least have them be able to recognize what they are. For some I do think they realize that some of those skills are inherent for some and for others I think they realize those skills have never been tapped into."

- "Reflective writing regards to patient encounters and encounters with faculty. The reflective writing continues all the way through the program."
- "We included in our curriculum, both as a standalone course, communication and interpersonal skills, and also infused these skills in other courses, like history and physical exam."
- "We have courses in team steps, inter-professionalism, ethics, and so forth. We like to think that we design courses that will build not just on medical knowledge."
- "We build the MMI stations around our mission/vision of our program. Some of the core things that we really find to be important to us: professionalism, medical reasoning, ethical skills, and teamwork/team application, are taught throughout the curriculum."
- "We have courses in clinical and professional skills which encompass communication and ethics. We have courses in medical and society, how you work in different cultures. So we really keep bringing it back over and over throughout the didactic phase and then certainly once they step into the clinical phase."
- "We have courses throughout the two years that really stress professionalism, ethics, and that type of growth."
- "It's [the course] a lot of working with the students to develop a lot of those soft skills or at least have them be able to recognize what they are. For some I think they realize that some of those skills are inherit, and for others I think that they [skills] have never been tapped in to."

Thematic Finding 4: Directors Report an Overall Positive Experience

There was an overwhelming response by all participants reporting a positive experience with using the MMI. PA directors also stated that PA faculty and staff expressed positive experiences because the MMI allowed them to better acquaint themselves with all candidates instead of just a few, as might happen in a more traditional interview. All participants supported the MMI as a measure of noncogntiive skills and planned to continue to use the MMI as an admission evaluation tool for upcoming cohorts. Statements that support this theme included:

- "I think it's positive. We are honing in on better questions and better attributes and things that we are looking for, but I think we are in favor of it and don't intend to change it."
- "The faculty loved it. When we asked everyone if they had any suggestions for changes and if they wanted to forge ahead, everyone was pretty much unanimous with doing the same thing [continuing the MMI]."
- "The students loved it. I get so many positive comments about the process, and the faculty really liked it."
- "Overall it's been super positive."
- "Extremely positive! We really like it."
- "We've been very pleased with the MMI."
- "They [the faculty], I think, really enjoyed being able to see all the applicants instead of just 2 out of 10 or 3 out of 15 that would come."
- "The department really wanted an interview process that allowed more people [faculty and staff] to see each applicant versus just the one on one interviews."

Thematic Finding 5: Data Collected by Programs Not Yet Analyzed

The researcher wanted to investigate if using the MMI as the program's interview instrument changed/affected outcomes of the students' preceptor evaluations. This researcher also wanted to investigate if the programs required a revision in their curricula, or the admission process, to meet the expectations of the noncognitive skill competencies as set forth by the MMI. PA directors felt that such data would be useful in considering program modifications, but they agreed that they have not yet analyzed the data collected to correlate any such changes. Statements to support the inadequacy of data in support of programmatic changes included:

- "I haven't seen hard data, one way or the other, that proves it. I'm hoping to be able to find it though because I think that it would validate what we are doing, but I don't know that we are going to have it yet because we haven't really done the data dive, but that is on the list of things to look at."
- "Unfortunately nothing yet because the students have not yet arrived on campus."
- "I haven't, but that is a great question."
- "I have not had a lot of time to look at most recent graduates, so I do not have a lot of data there. What I can say is anecdotally, it appears at least unchanged from prior, and I think overall improved."
- "We haven't really done any research or have any data to support yes or no. An interesting fact or questions, but we don't have it yet."

Thematic Finding 6: Change in Student Demographics

A final unexpected theme, or pattern, identified was that PA directors describe a shift in student demographics. This shift includes a younger population of students with less work experience than prior PA student cohorts. Statements that support this theme included:

- "The students are younger, more and more consistent with what you see in the current PA classes."
- "A lot of our students are very young, so it's just a matter of maturity. Through professional coursework…they learn how to interact with patients."

Summary

In this chapter, the researcher presented the narratives of the PA directors' experiences through a phenomenological perspective. The six themes that were identified through the analysis process were holistic review, rater training consistency, continued development and reinforcement of noncogntiive skills, directors report an overall positive experience, data collected by programs not yet analyzed, change in student demographics. In Chapter Five, a discussion of the findings, suggestions, and recommendations will be provided.

Chapter 5

Conclusion

Chapter Five includes an interpretation of the findings, implications of the study, recommendations for actions, and recommendations for further study. The purpose of this study was to investigate the experiences that PA directors have with applying the MMI as a measure of noncognitive skills. Research questions for this study were:

- What experiences have PA directors had with applying the MMI as a measure of noncognitive skills?
- What are the experiences of the PA directors using the MMI as an admission evaluation tool?
- Based on the outcomes of the clinical year preceptor evaluation, what experiences have PA directors had with the MMI as a method to assess an applicant's noncognitive skills?
- What experiences have PA directors had with well-developed noncognitive skills contributing to improving medical practice?

A thorough literature review highlighted a need for additional research relating to the MMI as an admission tool. As stated by (Knorr & Hissbach, 2014), there is a lack of theory-driven research on the predictive validity of MMIs. According to Brenneman et al. (2018), the PA profession has a unique opportunity to advance the admission process by reevaluating the weight of noncognitive factors when choosing a student cohort. The responses were classified into six main themes. A list of the six themes that were identified through analysis of the data is as follows:

1. Holistic Review
2. Rater Training Consistency

3. Development and Reinforcement of Noncognitive Skills
4. Directors Report an Overall Positive Experience
5. Data Collected by Programs Not Yet Analyzed
6. Change in Student Demographics

Interpretation of Findings

The research conducted used a phenomenological qualitative method to investigate the experiences PA directors have had with applying the MMI as a measure of noncognitive skills. The conceptual framework for this research was based on Solberg's (2007) idea of improving medical practice. The following is the interpretation of the findings as related to the identified six themes and how the themes relate to the experiences that PA directors have with applying the MMI as a measure of noncognitive skills.

Theme 1: Holistic Review

As shown in Chapter Four, PA directors repeatedly referenced how the holistic nature of the MMI was a useful tool for candidate selection by providing a level of standardization within the admission process. Such a perception aligns well with Lemay, Lockyer, Collin, and Brownell's (2007) conclusions that PA directors consider the MMI to be useful to programs as it offers a more defensible, reliable, and valid approach to the admission process. The Association of Medical Colleges (AAMC) has defined the holistic review process as one in which "balanced consideration is given to experiences, attributes, and academic metrics, and when considered in combination, how the individual might contribute value as medical student and future physician" (AAMC, 2017). It is thought that validation of decision reliability can help to provide the guidance needed to integrate interviews into the admission process (Kreiter, Yin, Solow, & Brennan, 2004). MMI interviews typically demonstrate the desired reliability and validity that

panel interviews are lacking (Griffin, Auton, Duvivier, Shulruf, & Hu, 2018). As discussed by Middleton (2008), it is important that the admission selection criteria to physician assistant programs be reliable and valid in discriminating individuals who have the knowledge, abilities, and experience to succeed. With regards to Solberg (2007), a holistic review adds to the priority needed to improve the quality of the admission assessment process.

Theme 2: Rater Training Consistency

Participants recognized and each stressed the importance of training on the MMI tool and interviewing skills to minimize inequity and inconsistencies. According to Eva and Sebok (as cited in Rees et al., 2016), rater training is an area that is crucial and needs development in order to improve the reliability of the MMI. In addition, according to Griffin and Wilson (as cited in Rees et al., 2016), when trainings changed from information based to skills-based training that included rating simulated interviews "the proportion of variance in their MMI scores attributable to difference between rater was reduced from 20.2% to 7.0%" (Rees et al., 2016, p. 449). According to Kreiter, Yin, Solow, and Brennan (2004), "existing literature does not provide sufficient evidence regarding interview reliability" (p. 157). Using the MMI as a measure of noncognitive skills as an admission evaluation does not mean instant reliability. However, if carefully designed and attention is given to the number of stations and examiner training, the MMI can be an effective way to measure the noncogntive skills desired by the PA program (Rees et al., 2016). Rater training consistency combats a potential barrier to the change process capability adding adequate resources and time that needs to be devoted to the change process (Solberg, 2007).

Theme 3: Development and Reinforcement of Noncognitive Skills

Participants felt that the logistics of the MMI closely resemble PA program assessment tools known as the objective structured clinical examinations (OSCEs) and scenario based active learning. These assessment tools are better aligned with the MMI for the development and reinforcement of noncognitive skills. According to Farrington et al. (2012), noncognitive skills are actually a better predictor than cognitive skills for successes in life and academics. Research has suggested that the PA profession should transition to giving more weight to noncognitive skills in the admission process (Farrington, et al., 2012). According to Sedlacek (2011), grades have become less of a predictor or indicator of student success. It is thought that this trend is due to grade inflation, and this is forcing educators to look at other variables to determine the readiness of a student to be admitted to a PA program. Assessing noncognitive skills is considered to be an alternative assessment that is fair and useful to all students (Sedlacek, 2011). Development and reinforcement of noncognitive skills also breaks down a potential barrier to the change process (Solberg, 2007). The PA director will need to demonstrate strong and effective leadership skills to ensure the continued development and reinforcement of noncognitive skills. The PA faculty, staff, and students will need to be individually accountable to maintain continued development and reinforcement of noncognitive skills (Solberg, 2007).

Theme 4: Directors Report an Overall Positive Experience

As stated in Chapter Four, there was an overwhelming positive response by PA directors' regarding experiences with the MMI. Due to the MMI allowing faculty to better acquaint themselves with all the candidates, PA directors also stated that the PA program staff and faculty expressed that their experience was a positive one. The MMI allows the PA faculty to engage with all of the candidates instead of only a few, as might happen in a more traditional interview.

According to Brenneman et al. (2018) although cognitive skills are easier to assess, through standardized test scores and grade point averages, noncognitive skills are also important to the overall success of a healthcare provider. More focus should be placed on the noncognitive skills during the admission process (Brenneman et al., 2018). Quality improvement has been achieved in programs using the MMI as evidenced by the overall positive experience that is reported by the PA directors. This overall positive experience motivates PA programs to make the MMI a priority to the admission process and improve the overall quality of assessment of noncognitive skills (Solberg, 2007).

Theme 5: Data Collected by Programs Not Yet Analyzed

Directors report that data collected by the programs regarding how the MMI affected student outcomes has not yet been analyzed. This researcher is unable to address the research question regarding the outcomes of clinical year preceptor evaluation with respect to the MMI as a method to assess noncognitive skills. Although participants expressed an interest in this question, the consensus was that enough data has not yet been collected. Of the six PA directors who participated in this study, two programs are in a provisional accreditation and four have continued accreditation. Even PA directors in programs with continued accreditation status admitted not collecting or analyzing the data to determine if the MMI results had any correlation or causation effect on the outcomes of clinical year preceptor evaluations or that the MMI warranted any programmatic changes. To ensure quality improvement, PA programs need to develop a self-assessment process to investigate horizontal and longitudinal alignment of the MMI with student outcomes. PA directors report that even though this data has been collected, analysis of this data has not been completed. This presents a barrier in the change process and lack of measurement skills to prove quality improvement (Solberg, 2007).

Theme 6: Change in Student Demographics

PA directors reported that they have witnessed a noticeable shift in the demographics of applicants and in-program students. That shift in applicants and in-program students includes a younger population of students with less work experience than prior PA student cohorts. Solberg (2007) recognized that with shifts there is a need for change in processes in order to improve medical practice, and may require a comprehensive organizational change. In 2017, the mean age of a PA student was 25.4 (PAEA, 2018) compared to the 29.7 mean age of a PA student in 1996-1997 (PAEA, 1997). According to Baum and Steele (2017), "students who earn their bachelor's degree at younger ages are consistently more likely than older students to go on to graduate school" (p. 3). PA programs can support the need for change based on the shift in student demographics. This shift creates another barrier to the change process; however, PA directors must educate PA faculty and staff of the infrastructure used to manage this change process (Solberg, 2007).

Limitations of Study

Limitations of this study included having six out of seven requested candidates participate in the study. This researcher had expected all seven that were contacted to be willing to participate. All these participants had response bias with data being highly subjective. All participants felt strongly about the advantages of the MMI and the importance of noncogntive skills as a component of the admission process. Although participants were asked if development and reinforcement of noncognitive skills occurs during the curriculum, this element was not the focus of the research and the method of delivery varied among participants. Additional limitations include a Hawthorne effect (Cherry, 2018) since this researcher's presence during the data gathering was unavoidable, it is unknown if the participants' reactions were influenced by

the direct observation of this researcher. The results of this study cannot be generalized to wider populations of PA programs with the same degree of certainty as quantitative analysis as this research did not test for statistical significance. Due to the broad nature of the interview questions, participants could interpret the definition noncognitive skills. A specific list, from the literature review, of noncognitive skills was not provided to participants; therefore it is assumed that this researcher and the participant were using the same definition of topics. Finally, this researcher did not assess alternative methods used to measure noncognitive skills.

Implications

Physician assistant directors who are looking for a more holistic approach to their admission process may be interested in the results of this study. Participants in this study felt that the MMI provided a standardized interview and viewed its use as a positive experience for PA directors, faculty, and staff. It is imperative to include a measure of noncognitive skills in the interview process in order for programs to assess skills such as empathy, ethical responsibility to self/others, oral communication, teamwork, critical thinking, resilience and adaptability, cultural competence, realistic self-appraisal, situational judgement, and professionalism (Brenneman et al., 2018). For programs seeking a transformation change in their admission process as well as their curriculum, the results of this study point to the importance of continuous longitudinal data gathering, review and analyses to ensure the development and reinforcement of requisite noncognitive skills to improve upon the noncognitive skills of graduates and ultimately impact and improve medical practice. Consistency in rater training on the use of the MMI admission tool may contribute to all candidates receiving a more standardized, reliable, and fair experience. With the admitted lack of longitudinal data, programs can use this knowledge as a catalyst for continued self-assessment and investigate correlations that may be associated with the MMI and

student outcomes. With a shift in student demographics, the MMI allows for faculty and staff to become acquainted will all interview candidates while the candidate is placed in a position to reveal skills beyond cognition.

Recommendations for Action

In order to successfully implement transformational change in an educational setting, PA directors can follow Solberg's (2007) conceptual framework of improving medical practice. This conceptual framework provides a guide to those who are testing various interventions, in this case the use of the MMI to assess noncognitive skills, for a change effort (Solberg 2007). Recommendations for action provided emerged from the six themes that resulted from this research. This framework focuses on three main elements and all must be present in order for outcomes to be both substantial and possess quality. The three elements are:

1. Priority - recognizing the need and usefulness of a more holistic approach to the admission process in PA programs
2. Change process capability - PA directors recognize that the program is capable of transformational change and receiving buy-in from the department
3. Care process content - PA programs must be willing to discuss the both the positive and negative of measuring noncognitive skills by using the MMI to ensure this admission tool is right for the program.

Recommendations for Further Research

Potential further research can include:

- Conduct a more extensive study tracking of the competencies and/or improvement of noncognitive skills at one program from the time of admission through the clinical year. The noncognitive skills that are being assessed at the time of admission can be

tracked through OSCE performance during didactic and clinical year, and then these same skills could be assessed by preceptors during clinical rotations.

- Determining if the type of rater training (virtual or in person) has any effect on the reliability of the MMI.
- Phenomenological qualitative research of certified PAs who were selected to a program that uses the MMI and their experience using noncognitive skills with patient interactions as well as his or her patient satisfaction results in clinical practice.
- Conduct a longitudinal study with the six PA directors that participated in this research to investigate if perceptions change or any changes to the curriculum were made after more student cohorts matriculate through the programs.

Holistic Review

The purpose of this study was to address the experiences that PA directors have with applying the MMI as a measure of noncognitive skills. The admission process for PA school has traditionally placed emphasis on cognitive skills such as GPA and standardized tests (Brenneman et. al., 2018). Results of this phenomenological qualitative research conducted as one-on-one interviews with six PA directors, indicate that applying the MMI a measure of noncognitive skills provided a more holistic approach to the admission process. This is as opposed to relying cognitive skills such as grades or standardized tests.

PA directors should consider prioritizing the assessment of noncognitive skills in their admission process by using the MMI. Programs should consider examining their current admission process to determine if and how noncognitive skills are included as part of the assessment. PA directors should involve the faculty and staff in reviewing the current process and prospects for change. When deciding on the use of an admission assessment tool like the

MMI, programs must weigh the advantages and potential disadvantages of its use in the context of program and learning outcomes, accreditation standards, students' demographics, and program, that are presented with employing the MMI. If the use of the MMI as an admission tool aligns with their program's mission and outcomes, then PA directors will need to ensure that all participants receive initial and ongoing MMI training in order to achieve rater consistency.

Rater Training Consistency

According to Knorr and Hissbach (2014) an additional positive influence on the validity of the MMI is the training provided to the rater prior to conducting a station. PA directors need to make rater training a priority in order to provide consistency throughout the MMI process. Participants stated that various training opportunities are available, whether they be online trainings or in-person training with experts in the implementation and use of the MMI. PA directors will need to educate all raters on the importance of training prior to conducting an MMI station and explain the value and need for standardization as a benefit to the student candidates. PA directors must be willing to discuss the various training options and determine which type of training is best for the program. According to Eva and Sebok (as cited in Rees et al., 2016), rater training is an area that is crucial to the needs development in order to improve the reliability of the MMI.

Development and Reinforcement of Noncognitive Skills

Given the emerging importance of noncognitive skills in medical practice, evaluating noncognitive skills should not occur only during the admission process. In order to impact medical practice, PA directors will need to include the development and reinforcement of noncognitive skills a priority during of the didactic and clinical years of the program. Continuous longitudinal data collection, review and analyses starting the MMI results through OSCEs and

other simulated scenarios must then become a priority to assess progress and ensure students meet the expectations of the competencies. PAEA (2016) recommends professional competencies for PAs include the effective and appropriate application of medical knowledge, interpersonal and communication skills, patient care, and professionalism. This could mean that a program might need to delay graduation for a student until he or she can prove competency. Whether these skills are developed and reinforced in a stand-alone course, or integrated into the current curriculum, they must continue to be assessed throughout the entire program to ensure competency. PA directors, faculty, and staff should examine the use of OSCEs and scenarios within both the didactic and clinical year curriculum in order to align, develop and reinforce noncognitive skills identified in the MMI. Program outcomes should be examined followed by a collaborative decision to introduce, integrate, and reinforce each competency within the curriculum. An environment must be such that PA faculty are willing to share both positive and negative feedback as they introduce any change of course delivery knowing that their comments will be heard by the PA director.

Directors Report an Overall Positive Experience

The experience with the use of the MMI by this small group of PA directors was overwhelmingly positive. According to Paget et al. (2012), better health outcomes, lower costs, and improved patient satisfaction and safety have all been associated with consistent and effective communication between the patient and the healthcare provider. With the priority being to implement the MMI, provide proper rater training, and continue to develop and reinforce noncognitive skills PA directors, students, clinical preceptors and ultimately the patients should experience a positive outcome with satisfaction in noncognitive skills. Should a program choose to integrate and measure noncognitive skills in its curriculum, use the MMI, be willing to

provide adequate and continuous rater training, and commit to continuous longitudinal data collection, review and analysis, then the process has the potential to improve medical practice.

Data Collected by Programs Not Yet Analyzed

Current programs that use the MMI as an admission tool, as well as programs that plan to implement the MMI, should develop a process of self-assessment to collect longitudinal data. The noncognitive skills assessed during the MMI can continue to be reassessed during both the didactic and clinical year of the PA program. PA directors should make data collection, review and analyses a priority in the PA program to determine if the MMI can be correlated with student outcomes. PA directors should determine the capability of revising or creating a new assessment to track students' noncognitive skills from the time of interview through clinical year. Assessments of noncognitive skills can be added to OSCEs by including a rubric for any or all of the ten common noncognitive skills including empathy, ethical responsibility to self/others, oral communication, teamwork, critical thinking, resilience and adaptability, cultural competence, realistic self-appraisal, situational judgement, and professionalism (Brenneman et al., 2018). These same skills can also be assessed on a clinical preceptor evaluation and then compared with the student's results on the interview and OSCE components. This will allow for the collection and analysis of longitudinal data.

Change in Student Demographics

PA directors must recognize that there is a reported shift in student demographics and understand the capability of the program to adapt to this shift. The care process content must include the PA director understanding both positive and negative factors as well as suggestions and feedback from faculty and staff on how to manage this shift. The MMI can measure how a

student in this changed demographic demonstrates noncognitive skills to give insight on how he or she will interact with peers and patients.

Conclusion

A holistic approach to the admission interview into a PA program allows PA faculty and staff to assess a candidate's noncognitive skills. This approach allows team members of the PA program to acquaint themselves with all candidates and gives them a better understanding of who the candidate is beyond grades and standardized test scores. With the proper rater training, the MMI is a reliable and valid assessment tool that can be used to measure noncognitive skills allowing all candidates to receive a more equitable experience. PA directors reported their experience with applying the MMI as a measure of noncognitive skills to be positive in nature. Because PA directors report not yet analyzing data that has been collected to make any correlations with the MMI and student outcomes in clinical year, this data collection and analysis is an idea for future research. With the shift in student demographics, the MMI can give insight into how a younger population will interact with patients. Overall, PA directors' experiences demonstrate that the MMI process has the potential to improve medical practice. Students who demonstrate competency in noncognitive skills succeed in simulated patient interactions in the classroom and continue to demonstrate these skills in the clinical setting.

Self-reflection

After conducting the six one-on-one interviews, it was evident that PA programs are using the MMI as an admission tool only. Programs have not yet explored any possible relationships or correlations that the MMI has with student outcomes; however, the PA directors expressed that their programs would like to conduct data analysis to examine any relationships or correlations that may exist. There is great opportunity to build upon the data collected from the

MMI, as mentioned above in suggestions for future research. Anecdotally, PA directors report that the MMI has decreased the amount of professional concerns with students during the clinical year, stating that the program's faculty and clinical directors have less incidents with students regarding poor professional behavior. This researcher has learned that even one with a predominately clinical background can in fact conduct research that impacts PA education, and this researcher plans to continue research into the importance of noncognitive skills in PA education.

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Appendix A: Conceptual Framework for Practice Improvement

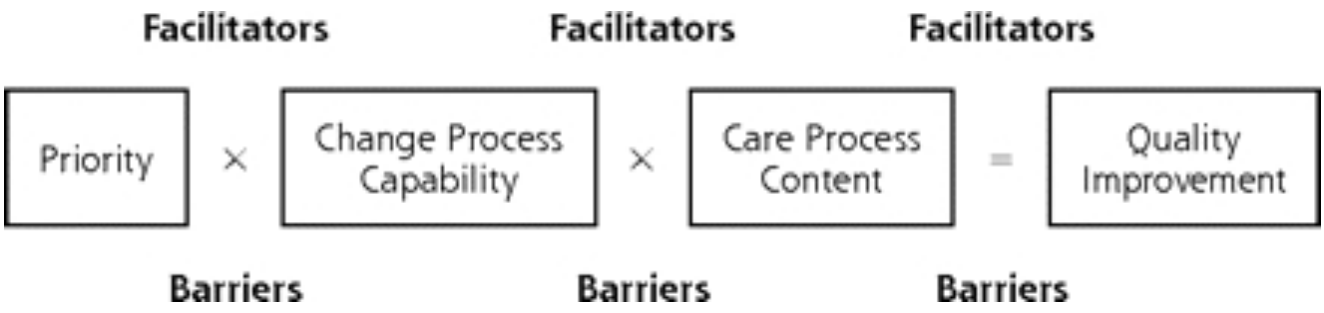

Diagram 1. Conceptual Framework for Practice Improvement. Reprinted from *Annals of Family Medicine*, 2007. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1886486/

Appendix B: IRB Approvals

UNE UNIVERSITY OF NEW ENGLAND

Institutional Review Board
Mary DeSilva, Chair

Biddeford Campus
11 Hills Beach Road
Biddeford, ME 04005
(207)602-2244 T
(207)602-5905 F

Portland Campus
716 Stevens Avenue
Portland, ME 04103

To: Lynnn Eckrote

Cc: Carey Clark, Ph.D.

From: Lliam Harrison, M.A., J.D. CIM

Date: February 11, 2019

Project # & Title: 19.02.08-002 The Influence of Noncognitive Skills in Physician Assistant Education

The Institutional Review Board (IRB) for the Protection of Human Subjects has reviewed the materials submitted in connection with the above captioned project and has determined that the proposed work is exempt from IRB review and oversight as defined by 45 CFR 46.104(d)(2).

Additional IRB review and approval is not required for this protocol as submitted. If you wish to change your protocol at any time, including after any subsequent review by any other IRB, you must first submit the changes for review.

Please contact Lliam Harrison at (207) 602-2244 or wharrison@une.edu with any questions.

Sincerely,

William R. Harrison, M.A., J.D. CIM
Director of Research Integrity

IRB#: 19.02.08-002
Submission Date: 02/04/19
Status: Exempt, 45 CFR 46.104(d)(2)
Status Date: 02/11/19

Appendix C: Modified Stevick-Colaizzi-Keen

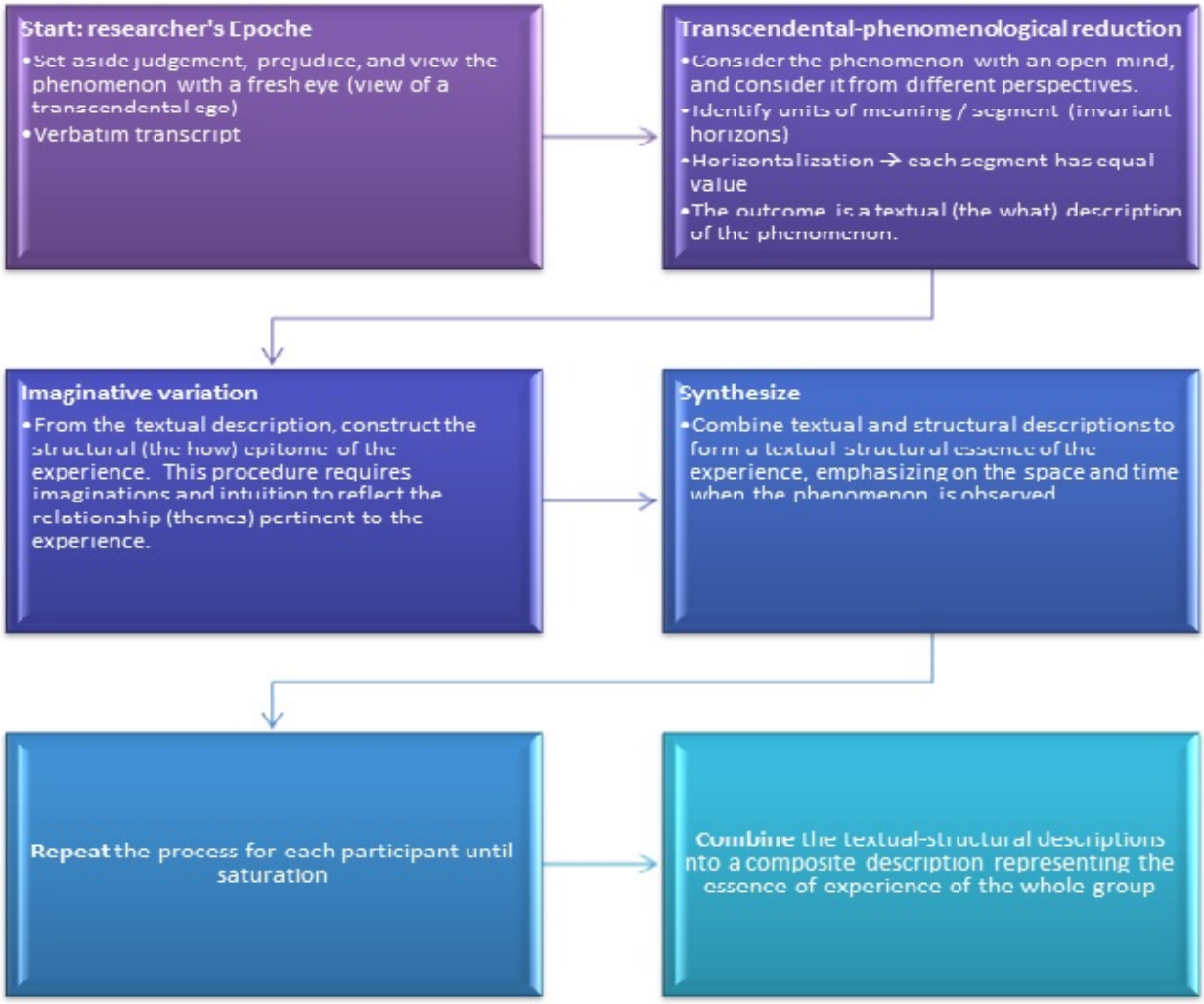

Diagram 2. Modified Stevick-Colaizzi-Keen. Reprinted from *Center for Innovative Research and Teaching (CIRT)*, n.d. Retrieved from https://cirt.gcu.edu/research/developmentresources/research_ready/phenomenology/methods_data

Appendix D: Informed Consent

Version 8.22.18

UNIVERSITY OF NEW ENGLAND

CONSENT FOR PARTICIPATION IN RESEARCH

Project Title: The Influence of Noncognitive Skills in Physician Assistant Education

Principal Investigator(s): Lynn Eckrote, MPAS, PA-C, Doctoral Student

Introduction:

- Please read this form. You may also request that the form is read to you. The purpose of this form is to give you information about this research study, and if you choose to participate, document that choice.

- You are encouraged to ask any questions that you may have about this study, now, during or after the project is complete. You can take as much time as you need to decide whether or not you want to participate. Your participation is voluntary.

Why is this research study being done?

The purpose of this study is to investigate the experiences that PA directors have with applying the multiple mini interview (MMI) as a measure of noncognitive skills.

Who will be in this study?

Participants will be PA directors from continued or provisionally accredited PA programs and that focus on physician assistant competencies as set forth by The National Commission on Certification of Physician Assistants, Physician Assistant Education Association, The Accreditation Review Commission on Education for the Physician Assistant, and the American Association of Physician Assistants.

What will I be asked to do?

Participate in a semi-structured one-on-one interview that will be conducted using Zoom at an agreed date and time that is convenient to you. Each interview will be approximately 30-45 minutes in length.

What are the possible risks of taking part in this study?

There are no risks or discomforts anticipated from participation in this study.

What are the possible benefits of taking part in this study?

There are no benefits from being a participant of this study.

What will it cost me?

There is no cost associated with being a participant in this study.

How will my privacy be protected?

Privacy will be protected by being asked to only use a pseudonym that will be pre-assigned by the principal investigator and speak in general terms, as to not provide any identifiable information. Member checking will be conducted after transcription to ensure validity and verify accuracy.

How will my data be kept confidential?

The information gathered during this study will remain confidential with all records to be kept private and locked in a file during the study. Only the principal investigator listed on this form will have access to the study data and information. The results of the research will be published in the form of a doctorate dissertation paper and may be published in a professional journal or presented at professional meetings. In any report or publication, the researcher will not provide any information that would make is possible to identify me as a participant.

What are my rights as a research participant?

- Your participation is voluntary. Your decision to participate will have no impact on your current or future relations with the University.
- Your decision to participate will not affect your relationship with Lynn Eckrote, MPAS, PA-C.
- You may skip or refuse to answer any question for any reason.
- If you choose not to participate there is no penalty to you and you will not lose any benefits that you are otherwise entitled to receive.
- You are free to withdraw from this research study at any time, for any reason.
    - If you choose to withdraw from the research there will be no penalty to you and you will not lose any benefits that you are otherwise entitled to receive.
- You will be informed of any significant findings developed during the course of the research that may affect your willingness to participate in the research.
- If you sustain an injury while participating in this study, your participation may be ended.

What other options do I have?

- You may choose not to participate.

Whom may I contact with questions?

- The researchers conducting this study are Lynn Eckrote

    - For more information regarding this study, please contact Lynn Eckrote at [redacted]

- If you choose to participate in this research, study and believe you may have suffered a research related injury, please contact Lynn Eckrote.

- If you have any questions or concerns about your rights as a research subject, you may call Mary Bachman DeSilva, Sc.D., Chair of the UNE Institutional Review Board at [redacted]

Will I receive a copy of this consent form?

- You will be given a copy of this consent form.

_____

Participant's Statement

I understand the above description of this research and the risks and benefits associated with my participation as a research subject. I agree to take part in the research and do so voluntarily.

_____ _____

Participant's signature or
Legally authorized representative

Date

_____

Printed name

Researcher's Statement

The participant named above had sufficient time to consider the information, had an opportunity to ask questions, and voluntarily agreed to be in this study.

Researcher's signature

Date

Printed name

Appendix E: Interview Questions

1) Why did the program choose to use the MMI and what is the program's experience with using the MMI?

2) How long has the program been using the MMI?

3) What is the program's experience in providing rater training prior to conducting the MMI?

4) Has using the MMI as the program's interview instrument changed/affected outcomes of the students' preceptor evaluations?

5) If noncognitive skills are important enough to consider upon application, how does the PA program further support development of noncognitive skills and what is the program's experience with doing this?

6) Did the PA program require a revision in its curriculum to meet the expectations of the noncognitive skill competencies as set forth by the MMI?

7) What has been the overall experience of using MMI?

8) Have PA directors made changes to their admissions process as a result of implementing the MMI?

9) Does the PA director's program teach, or in some way positively influence, a student's non-cognitive skills?