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Physician Assistant Burnout and Fulfillment related to Career Development and Physician Relationship

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Abstract

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by

Kari S. Bernard, MS, PA-C

MS, A.T. Still University, 2004

BS, Eastern New Mexico University, 1998

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Industrial and Organizational Psychology

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Abstract

Physician workforce shortages are driving increased clinical and administrative use of

non-physician healthcare providers. As a result, physician assistants (PAs) may

experience role expansion in a positive or negative manner. The purpose of this study

was to determine if aspects of PA career development related to role expansion interacted

with the quality of the collaborative physician (CP) relationship to predict PA well-being.

The job demands-resources (JD-R) model was used as the theoretical foundation and the

National Academy of Medicine's conceptual model of clinician well-being was used as

the conceptual framework. Research questions addressed whether PA experience level

predicted well-being, and if this relationship was mediated by autonomy or leadership

responsibility or moderated by the quality of the relationship with a CP. The quantitative

study was nonexperimental and employed an archival dataset. Bivariate linear

regression, mediation, and moderated mediation analyses were conducted. As PA

experience level increased, fulfillment increased and burnout decreased, and leadership

responsibility partially mediated these relationships. The quality of the CP relationship

emerged as the strongest direct predictor of PA well-being, and also moderated the

mediation of autonomy on the relationship between experience level and PA well-being.

By fostering positive collaborative relationships and offering opportunities for leadership,

employers may support PA role expansion. Supporting PA role expansion may lead to

positive social change by augmenting the ability of PAs to provide access to healthcare

for patients living in communities affected by physician workforce shortages.

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Dedication

This dissertation is dedicated to my mother and stepfather, Karen and Carl Miller. My mother taught me from a very early age that the pursuit of goals must be weighed against the risk to one's well-being. She regularly disregards her own motherly instincts, which compel her to shelter me from the dangers of the world, by supporting my endless pursuit of worldly adventures. When Carl leapt feet first into our family one decade ago, he embraced his expanded fatherly role with gusto. Both my mother and Carl have consistently provided me a safe space to fail and a celebratory space to triumph. By virtue of their support, I have endeavored to grow beyond my previous boundaries, and this dissertation is undoubtedly the most distinguished product. From the bottom of my heart and soul, I thank mom and Carl for their enduring love and encouragement.

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Finally, I would like to thank the many friends, family, and co-workers who learned the terminology inherent to doctorate education in order to make regular and informed inquiries about my progress. I also want to acknowledge Michelle McMoon, PhD, PA-C, who modeled how to successfully couple a demanding full-time career with a doctorate education. Dr. McMoon listened with knowing ears to my trials and tribulations and offered thoughtful and well-informed advice. My journey would have been lonelier and less meaningful without her and everyone else's support.

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Chapter 1: Introduction to the Study

Introduction

The physician assistant (PA) profession was created in the 1960s to fill physician workforce gaps that emerged after World War II (Physician Assistant History Society, 2017). Healthcare employers have continued to hire PAs to expand the capacities of existing physicians or fill provider positions otherwise left vacant (Filipova, 2014; Tetzlaff, Hylton, DeMora, Ruth, & Wong, 2018). PAs may experience an increasing demand for their services in either a positive or negative manner (Hoff, Carabetta, & Collinson, 2017). The overall goal of this research is to broaden what is known about PA professional well-being in the context of role expansion so that members of the profession may continue to provide sustainable access to healthcare in areas affected by physician shortages.

This chapter will begin with a summary of PA well-being research and existing gaps. A description of the timeliness, relevance, and significance of the research problem will be clearly stated and explained. Research questions and affiliated hypotheses will be outlined, and the theoretical foundation on which the study is based will be elucidated. A detailed explanation of the assumptions, scope, delimitations, and limitations of the research will be included. The chapter will conclude with a detailed description of the significance of the current research to existing PA well-being knowledge and to potential positive social change.

Background

PA utilization has expanded since the profession was first conceptualized 50 years ago, with the number of certified PAs in the United States exceeding 130,000 at the end of 2018 (National Commission on Certification of Physician Assistants [NCCPA], 2019a). Empirical evidence indicating that, in some areas of medicine, the quality of patient care provided by PAs is equivalent to that provided by physicians may be driving these trends (Dewan & Norcini, 2019). Characteristics unique to the PA occupational model, such as a general medical foundation that allows PAs to work in any specialty and move between specialties without additional training, may also contribute (Morgan, Himmerick, Leach, Dieter, & Everett, 2017). Current models created by researchers at the American Association of Medical Colleges (AAMC) predict a shortage of 46,900 to 121,900 primary care physicians, specialty physicians, and surgeons by 2032, signaling an ongoing need for PAs (American Association of Medical Colleges [AAMC], 2019). While increased professional demand for PAs may trigger enhanced job satisfaction and engagement, it may also result in stress and burnout (Hoff et al., 2017). Additional research is needed to understand how PA professional fulfillment may be maximized, and burnout avoided, so that members of the profession may be retained in the workforce.

Humans experience a broad spectrum of reactions to work; these reactions are referred to as job attitudes. Such job attitudes range from job satisfaction and professional fulfillment to burnout and intention to leave (Pinder, 2014). Empirical evidence demonstrates higher levels of professional fulfillment and lower levels of burnout among PAs as compared to physicians, albeit the margins are narrowing over

time (Essary et al., 2018; Smith, 2018). Estimates of the prevalence of physician burnout

increased from 45.5% (n = 3,310) in 2011 to 54.4% (n = 3,680, p < .001) in 2014

(Shanafelt et al., 2015a). During this same timeframe, physician satisfaction with work-

life balance decreased from 48.5% to 40.9% (p < .001). Physicians are demonstrating

higher levels of burnout, and lower levels of satisfaction, a circumstance that may be

compounding physician turnover and subsequent shortages.

In contrast, in the salary survey conducted in 2016 by the American Academy of

PAs (AAPA), 75% of PA respondents agreed or strongly agreed that they were happy at

work and 27% reported high or extreme enthusiasm for work (Coplan, McCall, Smith,

Gellert, & Essary, 2018). Regarding burnout, 21% reported moderate or higher levels of

cynicism and 10% a sense of personal failure (emotional exhaustion was not measured).

When directly comparing orthopedic PAs and physicians (n = 77), Shannon and

Merenstein (2017) found that PA respondents demonstrated higher levels of career and

lifestyle satisfaction, and lower levels of burnout, than their physician counterparts.

Unfortunately, researchers used a home-grown survey tool, making comparison with

research conducted outside of orthopedic practices difficult. The 2018 iteration of the

AAPA salary survey, which used a different job attitude tool from that used in earlier

years, demonstrated that 80% of respondents reported at least moderate happiness at

work (Smith, 2018). In spite of this, 46.2% of respondents met criteria for work

exhaustion, a higher prevalence than what was seen among physicians (45.5%), though

using a different measurement tool in 2011 (Shanafelt et al., 2015a). Although existing

research is challenging to interpret, trends indicate that while PAs may be more satisfied

and fulfilled at work than physicians, dimensions of burnout like exhaustion and cynicism are emerging.

Existing research also alludes to potential causes of PA professional fulfillment or burnout, though studies that employed predictive statistics are rare and longitudinal designs absent (Hoff et al., 2017). Filipova (2014) conducted a multivariate analysis of satisfaction levels of rural PAs ($n = 414$). She found that as the percentage of patients not discussed with their physician supervisors, termed collaborative physicians (CPs), increased the likelihood of PAs' satisfaction with their CPs, workload, and salary increased. Benson et al. (2016) evaluated burnout among rural PAs ($n = 161$) and found statistically significant correlations between each burnout dimension (emotional exhaustion, depersonalization, and sense of personal accomplishment) and workload control. These findings lend correlational support to Filipova's findings, although only among rural PAs. Autonomy may play a role in PA job satisfaction, but because current studies have been conducted in rural settings, it is difficult to generalize to PAs working in urban areas.

Only two studies have examined how the relationship with a CP affects PA job attitudes. Bell, Davison, and Sefcik (2002) determined that among a sample of emergency medicine PAs, those who were burned out were more likely to feel negative about their relationship with their CP. Bell et al. ascertained this by analyzing the content of optional comments left on the free text field of the quantitative survey used. Tetzlaff et al. (2018) found correlations between levels of burnout among oncological PAs and not feeling valued or encouraged by CPs, and not having contributions to the practice

recognized. Although done among smaller, specialty samples of PAs, these studies

further justify exploration of the effect of CP relationships on PA job attitudes.

While there is some evidence to support a correlation between the relationship

with a CP and PA burnout, there has been little research on the influence of taking on or

being assigned higher levels of leadership responsibilities on PA job attitudes. As PA

roles expand in clinical settings, PAs may be called on to take more significant levels of

responsibility for the delivery of healthcare (Gillette, Pedersen, & Pedersen, 2014).

Correlations between well-being and leadership have been studied among samples of

healthcare workers, though more often from the perspective of how managerial practices

influence them as direct reports (Montgomery, 2016). For example, Tetzlaff et al. (2018)

examined the association between perceived leadership qualities of the CP and self-

reported levels of burnout among oncology PAs. Shanafelt et al. (2015b) evaluated a

similar relationship among physician and scientist leaders at the Mayo clinic and their

physician direct reports. However, studies examining how leadership responsibility

influences the well-being of clinicians who serve as leaders or managers, are mostly

absent (Kelly, Lefton, & Fischer, 2019; Maza, Shechter, Eizenberg, Segev, & Flugelman,

2016; Van Bogaert et al., 2014). In preparation for potential expansion of PA leadership

opportunities, more research into whether increasing leadership responsibilities may be

related to the experience level and professional fulfillment or burnout of PAs is needed.

Problem Statement

The problem with PA role expansion is that taking on greater levels of clinical

autonomy and leadership responsibility may require PAs to expand their clinical

knowledge, skills, and abilities beyond traditional occupational boundaries (Hoff et al., 2017). PAs practice in a delegated supervisory model, which allows early career support with ever-increasing levels of autonomy as both their experience levels and their CP's confidence in their abilities grow (Hooker, Kuilman, & Everett, 2015). However, the nature of supervision varies between physician-PA teams (Cawley & Bush, 2015). When PAs practice with greater autonomy and accept more leadership responsibilities, it is worth considering whether the PA experience level and relationship with the CP interact with autonomy and leadership responsibility to contribute to professional fulfillment or burnout.

Extant PA well-being research is limited in its contribution to the question of how the expansion of PA involvement in the contemporary healthcare workplace in the context of workforce shortages may affect their well-being. Researchers have examined professional well-being using demographic and practice-level variables, like gender (Coplan et al., 2018; LaBarbera, 2010), medical specialty (Sierra, Forbes, & Nelson, 2019), and practice setting (Benson et al., 2016; Osborn et al., 2019), in descriptive or correlational analyses. Consideration for how aspects of PA career development may influence well-being is lacking, as are theoretically or conceptually grounded research and researchers who employed predictive analyses among more representative samples of PAs (Hoff et al., 2017). Such shortcomings make generalizing and predicting PA job attitudes difficult. Considering the vital role that PAs are expected to play in filling care gaps left by physician shortages (AAMC, 2019), it is essential to quantify these factors to retain PAs as a professionally fulfilled workforce.

Theoretically, as PA experience levels increase, autonomy and leadership responsibility should also increase. On the other hand, if the relationship of experience level with autonomy and leadership is incongruous, poor professional well-being may result. In both circumstances, either a congruent or incongruent relationship between experience level and autonomy and leadership responsibility, it is conceivable that the nature of the CP relationship may moderate professional well-being. This study design was unique because it involved a theoretical foundation and multivariate analysis, both of which Hoff et al. (2017) stated are lacking in other PA well-being research studies.

Purpose

The purpose of this quantitative research was to test the job demands-resources (JD-R) model (Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) in the context of the PA profession. Specifically, whether or not experience level, autonomy, leadership responsibilities, and CP relationship predict professional fulfillment was examined. Multiple regression analysis with both mediation and moderation was used to determine predictive relationships between these variables.

Research Questions and Hypotheses

Archival data gathered in 2018 by the AAPA, embedded in which is the Professional Fulfillment Index (PFI; Trockel et al., 2018), was used to evaluate the following research questions and hypotheses:

Research Question 1 (RQ1): Does PA experience level predict professional well-being?

Null Hypothesis ($H_0$1): PA experience level does not significantly predict

professional well-being, as measured by the PFI.

Alternative Hypothesis (H_a1): PA experience level significantly predicts

professional well-being, as measured by the PFI.

Research Question 2 (RQ2): Does PA autonomy mediate the relationship between

experience level and professional well-being?

Null Hypothesis ($H_0$2): PA autonomy, as measured by the single autonomy item,

does not significantly mediate the relationship between experience level and

professional well-being, as measured by the PFI.

Alternative Hypothesis (H_a2): PA autonomy, as measured by the single autonomy

item, significantly mediates the relationship between experience level and

professional well-being, as measured by the PFI.

Research Question 3 (RQ3): Does PA leadership responsibility mediate the

relationship between experience level and professional well-being?

Null Hypothesis ($H_0$3): Leadership responsibility, as measured by the composite

leadership score, does not significantly mediate the relationship between

experience level and professional well-being, as measured by the PFI.

Alternative Hypothesis (H_a3): Leadership responsibility, as measured by the

composite leadership score, significantly mediates the relationship between

experience level and professional well-being, as measured by the PFI.

Research Question (RQ4): Is the relationship between PA autonomy and

professional well-being moderated by the quality of the CP relationship?

Null Hypothesis 4 ($H_0$4): The quality of the CP relationship, as measured by the single CP relationship item, does not significantly moderate the relationship between PA autonomy as measured by the single autonomy item, and professional well-being, as measured by the PFI.

Alternative Hypothesis (H_a4): The quality of the CP relationship, as measured by the single CP relationship item, significantly moderates the relationship between PA autonomy, as measured by the single autonomy item, and professional well-being, as measured by the PFI.

Research Question 5 (RQ5): Is the relationship between PA leadership responsibility and professional well-being moderated by the quality of the CP relationship?

Null Hypothesis ($H_0$5): The quality of the CP relationship, as measured by the single CP relationship item, does not significantly moderate the relationship between PA leadership responsibility, as measured by the composite leadership score, and professional well-being, as measured by the PFI.

Alternative Hypothesis (H_a5): The quality of the CP relationship, as measured by the single CP relationship item, significantly moderates the relationship between PA leadership responsibility, as measured by the aggregate leadership score, and professional well-being, as measured by the PFI.

Theoretical Framework

The JD-R model created by Demerouti et al. (2001) was used as the theoretical framework for this study. Because the JD-R model addresses the relationship between

job resources and states of professional well-being, it has been extensively referenced in studies of healthcare staff, though primarily among nurses and physicians (Karaeminogullari, Erdogan, & Bauer, 2018; Viotti, Gilardi, Guglielmetti, & Converso, 2015). According to the JD-R model, job demands represent the investment of physical or mental energy that is necessary to accomplish job tasks or cope with workplace stressors, like excessive workload or interpersonal conflict (Demerouti et al., 2001). If the energy expended on job demands is not replenished, the JD-R model predicts a cumulative loss of energy and resultant emotional, mental, and physiologic exhaustion. The energetic loss happens as a result of both prolonged sympathetic activation and amplified cognitive exertion. The spectrum of exhaustive presentations may range from fatigue to job-related anxiety or depression to physical illnesses.

Job resources, on the other hand, curb the effect of energy expenditure through the addition of health-preserving factors (Demerouti et al., 2001). Job resources encompass both external and internal factors that allow an employee to remain functionally engaged even when exposed to workplace stressors. External job resources can be organizational, such as job control or participatory decision making, or social, such as interpersonal support. Internal job resources are thought and action tendencies of individual employees. Employees who possess key internal job resources, such as resilience and conscientiousness, can be sought through the employee selection process. Employers can modify only external, not internal, job resources as a means of enhancing the job attitudes of their current workforce.

If job resources are inadequate to meet job demands, the JD-R model predicts that disengagement will ensue. Job resources predict job attitudes through their interaction with job demands (Demerouti et al., 2001). First, if external job resources are present at sufficient levels necessary to counter physical and psychological expenditures, then motivation and engagement may result. However, if job resources required to meet job demands are inadequate, the JD-R model predicts that disengagement, as a form of self-protection, will ensue. For PAs, this suggests that a lack of autonomy, leadership opportunity, and CP support may lead to decreased motivation and potential disengagement from the workplace. Taking the JD-R model further, Bakker and Demerouti (2007) theorized that high job demands paired with high job resources could trigger motivation and engagement. It is possible that, when considering the PA profession through the lens of the JD-R model, high job demands can be attenuated with enhanced autonomy, leadership opportunity, and CP support to preserve PA engagement.

Nature of the Study

The study was quantitative with a nonexperimental design. Multiple regression analysis was conducted to understand how job factors relevant to a delegated supervisory practice are related to PA professional well-being in the context of career development. The PFI was used to measure professional well-being and identify PA respondents who were either professionally fulfilled or burned out. Many PA well-being studies have incorporated either the full Maslach Burnout Inventory (MBI; Benson et al., 2016; Tetzlaff et al., 2018; Varner & Foutch, 2014), the validated single-item version of the MBI (Edwards et al., 2018), the Medscape Physician Lifestyle Report (Coplan et al.,

2018), or home-grown tools which lacked validity and reliability data (Shannon &

Merenstein, 2017). The PFI was used for this study because it is open source, has been

validated against several established instruments—including the MBI—and has strong

internal reliability measures (Trockel et al., 2018).

Definition of Terms

Advanced practice provider: PAs and other nonphysician healthcare providers,

such as advanced practice registered nurses.

Autonomy: the ability to exercise control over important aspects of work, such as

clinical decision-making (Filipova, 2014). For a PA, autonomy may manifest as the

percentage of time spent consulting with a CP about patient care (Cawley & Bush, 2015).

For example, newer or less experienced PAs, or PAs working in more regulated or

restrictive environments, may consult with a CP to a greater degree, and thereby

demonstrate less autonomy.

Burnout: a negative affective state characterized by depleted emotional and

physical energy, and disengagement from patients and colleagues (Trockel et al., 2018).

Collaborative Physician (CP): the licensed physician who provides supervision to

or collaboration with a PA (Cawley & Bush, 2015). Most state laws require that, before

practicing, a PA must identify a licensed physician who will serve as a CP and formally

register their relationship with the state board responsible for granting PA licenses. The

nature of the PA-physician relationship is meant to be one of flexible delegation, in that

physicians may delegate tasks based on the PA's knowledge, skills, and experience

(Dunker, Krofah, & Isasi, 2014).

Collaborative Physician relationship: the quality of the relationship between a PA and CP, as perceived by the PA.

Experience level: the number of years since graduation from PA training. This number encompasses the entire length of a PA's career, including job and specialty changes.

Interpersonal disengagement: a lack of empathy toward or connection with patients or colleagues (Trockel et al., 2018).

Leadership responsibility: tasks taken on by PAs representing responsibilities beyond clinical charges. Such tasks may include, but not be limited to, serving on a committee, leading a team, or conducting quality improvement projects (Gershengorn et al., 2011; Wilson, Furman, & Orozco, 2019).

Physician Assistant (PA): a nationally certified healthcare provider who is licensed at the state level to practice medicine in a team-based setting with physician collaboration (American Academy of PAs [AAPA], 2019a). Core PA medical tasks include: taking medical histories; performing physical exams; ordering and interpreting diagnostic tests; diagnosing, treating, and managing illnesses and injuries; prescribing medications; assisting in surgery; and performing both simple and complex medical procedures. PAs may share the management of patients with their CPs, or they may manage patients on their own, be it in the same medical facility or in medical facilities geographically separated from their CPs.

Professional fulfillment: the intrinsic positive experience that results from a job that is rewarding, engaging, and meaningful, among other positive attributes (Trockel et al., 2018).

Professional well-being: a state of work-related health that encompasses three dimensions, or physical, mental, and social health (World Health Organization [WHO], 2019).

Work exhaustion: a job-related state of physical or emotional energy depletion (Trockel et al., 2018).

Assumptions

Several assumptions were made in regard to the current research. It was assumed that respondents to the 2018 AAPA salary survey answered the questions honestly. Additionally, it was assumed that aspects of a PA's career, such as autonomy and leadership responsibility, should increase as experience level increases, and that such career development has implications for PA professional well-being. Also assumed was that dimensions of career development, which make up the predictor variables in the current research, and professional well-being, which make up the outcome variables, can be measured. Finally, it was assumed that the affiliated survey item accurately reflected the quality of the relationship between PAs and CPs.

Scope and Delimitations

The scope of the current research involved measuring the professional fulfillment and burnout of PAs who were participating in the workforce in either a clinical or administrative capacity. The population did not include retired PAs, non-PAs, or PAs

who had recently changed jobs or specialties. Retired PAs were not evaluated because their attitudes may not have been relevant to the current healthcare marketplace. Assessing the job attitudes of non-PAs, like physicians or nurses, did not directly relate to the research questions, nor did it fill the research gap that existed regarding the well-being and burnout of PAs. Consideration of PAs who had changed jobs or specialties within the year previous to when data were collected was too problematic. Changing work settings introduces confounding variables, such as decreased self-efficacy in a new medical specialty area, that may have influenced outcomes. Also, other job-related career attitudes like job satisfaction, intention to leave, or turnover, or psychopathologies like anxiety or depression, were not considered. While burnout may coexist with each of these other conditions, consideration for such relationships was beyond the scope of the current research.

Limitations

Several potential barriers existed related to the use of an archival dataset. First, access to archival data requires a partner-site agreement. Although the AAPA has a process for requesting the use of data, members of their research department ultimately controlled access to the data for secondary analysis. Additionally, secondary researchers must rely on the sampling methods utilized by the AAPA; therefore, issues of representativeness may have arisen. Secondary researchers may assign different constructs to survey items that were originally intended, a limitation that may influence how results are interpreted. Finally, researchers using archival data must account for the ethical standards used by the original researchers.

Significance

A predictive approach to the question of antecedents to PA professional fulfillment and burnout and the role that CP relationships may play contributed to the existing literature in multiple ways. First, the current research is timely in its expansion of existing knowledge of how aspects of a delegated supervisory practice, in particular, the relationship with a PA's CP, may predict PA professional well-being. The PA practice model was founded on the concept of cooperation with a CP (AAPA, 2019a). Healthcare market forces currently driving PA role expansion were also spurring a political movement away from the required PA relationship with a specific physician (American Academy of PAs [AAPA], 2019b). As individual PAs, PA employers, and policymakers consider the utility of the delegated practice model, it was an especially important time to understand the relationship of physician collaboration on PA job attitudes.

This research was also relevant for employers of PAs serving patients in physician shortage areas. In the 2019 report projecting future physician supply, researchers at the AAMC determined that PAs will play a significant role in maintaining patient access to primary and preventive care services through the year 2032 (AAMC, 2019). The PA occupational model, which involves an expedited generalist medical instruction supplemented with on-the-job training, facilitates the ability of PAs to change practice settings without having to first pursue additional medical training (Warner, Maio, & Hudmon, 2013). As such, members of the PA profession may more readily respond to health system needs by taking jobs in physician shortage areas. One example of this is

the vital role of PAs in rural areas, where residents tend to experience the effects of physician shortages more significantly (Huckabee & Wheeler, 2011). Practicing in rural areas may be more stressful, however, as rural PAs may practice with greater autonomy, higher workloads, and less administrative support (Benson et al., 2016). Significant predictors of PA professional well-being, related to expanded clinical and leadership responsibility, were identified in this study. These predictors may be used as PA-specific interventions in future studies.

This research contributed to positive social change, as well. By expanding what was known about burnout to PAs, access to healthcare for patients may be more reliably maintained. Burnout among physicians has correlated with problematic organizational indicators such as reduced productivity, intention to leave, higher likelihood of medical errors, and reduced personal physical and psychological health, all of which may exacerbate existing physician shortages (Dyrbye et al., 2017). To avoid the emergence of these same outcomes among PAs, employers filling workforce gaps with PAs must understand how key job factors predict their professional well-being.

Summary

Taking on more demanding clinical and leadership roles, such as what may be required in physician workforce shortage areas, may have positive or negative effects on PA well-being. PAs have consistently demonstrated high levels of job satisfaction and professional fulfillment, but current burnout levels are concerning. Existing evidence indicates that autonomy and CP relationship may play a role in PA well-being, though it is difficult to generalize this data. Extant literature also lacks an examination of whether

leadership responsibilities influence PA well-being. Several existing gaps related to the

effect of autonomy, leadership responsibility, and CP relationship at various career stages

on PA professional fulfillment and burnout were addressed in this study.

Chapter 2: Literature Review

Introduction

The PA profession's utility in increasing patient access to care in the context of looming physician shortages may depend in some part on how job resources allowing for PA role expansion interact to influence PA professional well-being (Hoff et al., 2017). The focus of this study was to test the JD-R model conceived by Demerouti et al. (2001) in the context of PA professional well-being. The goal was to determine if PA experience level, autonomy, leadership responsibility, and CP relationship predict professional fulfillment or burnout. This chapter contains a review of the literature search strategy, theoretical foundation, and conceptual framework. A discussion of fundamental variables will follow.

Literature Search Strategy

Databases that I searched for this literature review included PsycINFO, CINAHL and Medline combined, and ProQuest Nursing and Allied Health. Population search terms included: *medical personnel, health personnel, physician, physician assistant, advanced practice provider, advanced practice clinician, nurse practitioner, advanced practice registered nurse*, and *nurse manager*. Search terms related to outcome variables included: *burnout, occupational stress, fulfillment*, and *job satisfaction*. Population and outcome variable search terms were combined with the terms: *job experience level, occupational tenure, vocational maturity, career length*, and *career stage* to identify relevant predictor variable literature. Population and outcome search terms were also combined with the terms: *autonomy, leadership, career development*, and *professional*

development, to identify literature regarding the potential mediator variables. The terms: *manager relationship, supervising physician relationship, collaborative physician relationship*, and *supervisor support* were also combined with population and outcome variable search terms to identify literature related to the potential moderator variable. The phrases *job demands-resources* and *professional fulfillment index* were used to search for theoretical foundation and conceptual framework literature, respectively. Searches were limited to peer-reviewed documents in English that were published within the last 5 years. Documents searched included abstracts, journal articles, commentaries, and any review type.

Reference pages of articles were also searched for relevant literature, which resulted in the inclusion of some articles that were published greater than 5 years ago. Seminal articles for key concepts were likewise included. Finally, the corresponding author of the study that validated the PFI, the measurement tool used for the outcome variables in this study, was emailed for assistance with retrieving current unpublished manuscripts featuring the tool.

Theoretical Foundation

Humans experience a broad spectrum of reactions to work, ranging from job satisfaction and professional fulfillment to burnout and intention to leave (Pinder, 2014). For the purpose of this study, these work-related reactions were referred to as job attitudes. Previous job attitude researchers found certain factors may influence a worker's reaction to job tasks, and that these reactions are subsequently related to productivity, retention, and turnover. One job attitude frequently referenced concerning

these important organizational outcomes is professional well-being. Researchers at the

World Health Organization (World Health Organization [WHO], 2019) define well-being

as a state of good health in three dimensions, or physical, mental, and social health. Each

of these dimensions may play out at work in the form of professional well-being.

Burnout and Professional Fulfillment

The negative valence of professional well-being may be operationalized as

burnout (Beehr, 2007). The term burnout represents an undesirable job attitude

characterized by three dimensions, or emotional exhaustion, depersonalization, and a

decreased sense of personal accomplishment. (Maslach & Leiter, 1997). Emotional

exhaustion references a state of depleted emotional energy, in which employees may lack

adequate emotional resources to meet the demands of their job (Varner & Foutch, 2014).

Depersonalization refers to the callous or apathetic attitude that employees may adopt

toward their customers (Osborn et al., 2019). Personal accomplishment identifies a

decreased sense of self-perceived competency and is reflective of a disappointing attitude

toward oneself (Varner & Foutch, 2014).

The three dimensions of burnout are thought to exist along a spectrum, in which

emotional exhaustion may trigger cynicism and detachment, leading to decreased

professional performance (Zhang et al., 2019). In the healthcare workplace, the

ramifications of decreased clinical performance involve both the individual worker, who

is accordingly at higher personal risk for substance abuse, suicide, and poor physical

health, as well as the patient and the healthcare system as a whole (Dyrbye et al., 2017).

Extant burnout literature correlates levels of burnout among physicians and nurses with

several problematic outcomes, such as increased self-reported medical errors, hospital-associated infections, and critical care patient mortality, and decreased patient access to care through clinician turnover, framing the issue as one relevant to public health (National Academy of Medicine [NAM], 2019).

Several validated and reliable tools are available to measure burnout, but the gold standard among them is the MBI (West, Dyrbye, Sloan, & Shanafelt, 2009). The MBI has three subscales, each corresponding to one of the three dimensions of burnout. MBI burnout criteria include high scores on either the emotional exhaustion or depersonalization subscales, or low scores on the personal accomplishment subscale (West et al., 2009). Multiple PA well-being researchers have used the MBI (Bell et al., 2002; Benson et al., 2016; Osborn et al., 2019; Tetzlaff et al., 2018; Varner & Foutch, 2014). Critics of the MBI have cited its focus on negatively experienced emotions (Trockel et al., 2018). Other critics of the full MBI assert that low professional accomplishment is unlikely among groups of high achieving healthcare workers, and allege that this subscale is not a valid indicator of burnout among this population (West et al., 2009). In response, other tools have been developed.

As a means of assessing professional well-being from both positive and negative perspectives, contemporary tools have incorporated items representative of more constructive job attitudes alongside burnout (Pinder, 2014). One such tool is the PFI (Trockel et al., 2018). The PFI has three subscales, the first of which measures work exhaustion and is considered equivalent to the MBI's emotional exhaustion subscale. The second subscale, termed the interpersonal disengagement subscale, goes beyond the

scope of the MBI's depersonalization subscale. Rather than only referencing patients, or consumers as the MBI does, the PFI's disengagement subscale also references a lack of empathy or connection toward colleagues, providing a deeper glimpse into the extent of interpersonal detachment. The final subscale, which measures a construct termed professional fulfillment, includes items addressing the perceived rewards, such as happiness, satisfaction, perceived worthiness and value, sense of empowerment, and work meaningfulness, that may be derived from participation in job-related tasks. Together, the PFI's three subscales create a balanced assessment of work-related experiences (Zhang et al., 2019).

Job Demands-Resources Model

The JD-R model presents a theoretical framework that predicts how the interaction of job demands and resources may predict job attitudes such as burnout and professional fulfillment (Bakker & Demerouti, 2007; Demerouti et al., 2001). The JD-R model has been extensively referenced in studies of healthcare workers, though primarily among nurses, physicians, and nonclinical staff (Anagnostopoulos, Demerouti, Sykioti, Niakas, & Zis, 2015; Karaeminogullari et al., 2018; Livne & Goussinsky, 2018; Viotti et al., 2015). At present, there are no studies examining the JD-R model among samples of PAs.

According to the JD-R model, job demands represent the investment of physical or mental energy that is necessary to accomplish job tasks or cope with workplace stressors, like excessive workload or interpersonal conflict (Demerouti et al., 2001). If the energy expended on job demands is not replenished, the JD-R model predicts a

cumulative loss of energy and resultant emotional, mental, and physical exhaustion. The energetic loss happens as a result of both prolonged activation of the sympathetic nervous system and intensified cognitive exertion. The spectrum of exhaustive presentations may range from fatigue to job-related anxiety or depression to physical illness.

Job resources may curb the effect of energy expenditure on job demands through the provision of health-preserving factors (Demerouti et al., 2001). Job resources encompass both internal employee attributes and external environmental attributes. Internal job resources are thought and action tendencies of individual employees. Employees who possess key internal job resources, such as resilience and conscientiousness, can be sought through the employee selection process. External job resources can be organizational, such as job control or participatory decision making; or social, such as interpersonal or supervisor support. Both internal and external job resources may allow an employee to remain functionally engaged even when exposed to workplace stressors.

Job resources predict job attitudes through their interaction with job demands. (Demerouti et al., 2001). First, if job resources required to meet job demands are inadequate, the JD-R model predicts that disengagement, as a form of self-protection, may develop. For PAs, the JD-R model indicates that inadequate autonomy, leadership opportunity, and CP support may lead to decreased motivation and potential disengagement from the workplace. However, pairing high job demands with high job resources may trigger motivation and engagement (Bakker & Demerouti, 2007). In this way, it is conceivable that high PA job demands can be attenuated with enhanced

autonomy, leadership opportunity, and CP support to maintain or increase PA engagement.

Though none have engaged PA respondents, several researchers have used the JD-R model to examine whether or not job resources buffer the health and professional well-being of healthcare workers in demanding occupational settings. In a quantitative study, Karaeminogullari et al. (2018) examined whether job resources, such as workload control, would buffer the relationship between patient mistreatment and the professional well-being among a sample of Turkish healthcare workers engaged in direct patient care. Karaeminogullari et al. discovered that when satisfaction with job resources was high, the relationship between stress resulting from patient mistreatment and poor mental health indicators was stronger than if satisfaction with job resources was low, a circumstance that countered what was predicted by the JD-R model. Karaeminogullari et al. posited that higher levels of satisfaction with job resources, in general, might cause employees to be more sensitized to mistreatment by patients. Findings from this study reflect the value of the JD-R model in identifying surprising relationships between variables.

Other studies have identified specific job resources that may mediate or moderate the relationship between job demands and burnout. Livne and Goussinsky (2018) applied the JD-R model to two samples of healthcare-affiliated students and workers in a quantitative evaluation of whether autonomy interacts with workplace bullying to predict professional well-being. Livne and Goussinsky found that low autonomy levels moderated the relationship between workplace bullying and both emotional exhaustion and depersonalization. In a similar vein, Viotti et al. (2015) used the JD-R model to

examine how levels of emotional exhaustion and depersonalization among two cohorts, one of nurses and another of nurse's aides, were influenced by the interaction of verbal aggression and various job resources. Organizational level resources, as well as social resources, including supervisor support, buffered the relationship between verbal aggression and burnout for both cohorts, while autonomy-related resources served as a buffer for nurses, but not for nurse's aides. Autonomy may only be significant for occupational categories with a higher scope of practice. Nonetheless, findings from studies by Livne and Goussinsky and Viotti et al. both support the correlation asserted by the JD-R model between inadequate job resources and more severe burnout, as well as adequate job resources and more attenuated burnout.

One area of variance demonstrated in JD-R model literature is how the interaction of autonomy and healthcare experience level predicts professional well-being. Anagnostopoulos et al. (2015) created a JD-R model to examine burnout as a mediator of the relationship between job demands and resources on the mental health of medical residents in Greece. Anagnostopoulos et al. determined that supervisor support and perceived opportunities for professional development had both direct effects on emotional exhaustion and indirect effects on mental health through emotional exhaustion. Similar to the nurse's aide cohort in Viotti et al. (2015), however, there was no direct relationship between autonomy and emotional exhaustion for Greek medical residents. Anagnostopoulos et al. theorized that because medical residents view themselves as trainees, they may not aspire to autonomy to the same extent as graduate physicians.

When autonomy fails to predict burnout, a meaningful relationship with other job factors may exist. For example, in the study by Anagnostopoulos et al. (2015), as medical residents experience level increased, autonomy increased. The linear relationship between career length and autonomy has been seen in studies of other healthcare providers (Lelli, Hickman, Savrin, & Peterson, 2015) and higher perceived autonomy has positively correlated with well-being for PAs (Ashooh, Barnette, Moran, O'Shea, & Lall, 2019; DePalma, Alexander, & Matthews, 2019; Filipova, 2014; Nelson & Hooker, 2016), physicians (Domagała et al., 2018), and other healthcare workers (Cain et al., 2017). Therefore, the corresponding increase in Greek resident autonomy alongside experience level may have served as a resource that buffered against the development of burnout (Anagnostopoulos et al., 2015). Findings by Dreison, White, Bauer, Salyers, and McGuire (2018), in which the perception of supervisor-supported autonomy predicted lower levels of burnout among a sample of mental health workers, support this. Such nuanced behavior of autonomy as a job factor within the JD-R model speaks to the model's utility in detecting unique occupational attributes that may interact with the construct to create professional well-being.

The JD-R model is a useful theoretical foundation for use in the examination of which job resources may directly predict or may serve as mediators or moderators of PA professional well-being or burnout. For example, PAs may desire less autonomy in the early years of their careers, which are commonly characterized by extensive on-the-job training (Polansky, 2011). As their careers mature, however, autonomy commensurate with experience level may represent a job resource that boosts professional well-being

(Hooker et al., 2015). If a PA whose career has matured experiences inadequate autonomy, burnout may ensue. Further, similar to findings by Anagnostopoulos et al. (2015), if adequate professional development opportunities are unavailable, burnout may ensue. Finally, the PA profession is characterized by a team approach to healthcare, in which support from a CP is vital (Polansky, 2011). The support from the CP indicates the quality of the CP relationship could either enhance or diminish the association between other job resources, such as autonomy and leadership roles, and PA professional well-being.

Conceptual Model of Clinician Well-Being

While the JD-R theory provides a feasible foundation from which to examine professional well-being, the clinician well-being conceptual model created by a group of experts with the National Academy of Medicine (NAM), a nonprofit research institute in the United States, provides a specific infrastructure for the application of the theory to the practice of PAs and other clinicians. According to a recent NAM report outlining systems-level considerations for clinician well-being, burnout develops secondary to a "chronic imbalance of high job demands and inadequate job resources" (NAM, 2019, p. 2). The NAM conceptual model identifies job resources that, when present at inadequate levels, may negatively influence clinician well-being similar to what the JD-R model predicts.

The NAM model delineates three systems, or work environments, within which certain job factors play out to influence clinician well-being (NAM, 2019). These three systems are the frontline delivery of care, the healthcare organization, and the external

environment. Within the frontline delivery of care system, clinicians, healthcare trainees, and support staff interact with patients and families to dispense medical services. The greater healthcare organization system contributes to frontline interfaces by creating the operational infrastructure, in the form of protocols, policies, and procedures, and providing physical resources such as tools and technologies. The external environment system creates opportunities for or barriers to the provision of care by frontline workers or healthcare organizations.

The NAM model operationalizes job factors that interact and create the clinician experience of well-being as either job demands or job resources (NAM, 2019). Job demands encompass such factors as excessive workload, inadequate staffing, administrative burden, inefficient workflow, time pressure, moral distress, and factors unique to patients. Adequate job resources must be available to counteract the influence of job demands on the professional well-being of frontline workers.

Job resources are split into two categories. One category includes attributes that an individual clinician may possess, such as resilience, social support, and coping tendencies, which can mediate their experience of well-being (NAM, 2019). The JD-R model labels these as internal resources, which are only modifiable through the selection process and hiring employees with these attributes (Demerouti et al., 2001). The second category of job resources identified within the NAM model is organization-level factors (NAM, 2019). These include organizational meaning, purpose, and culture; alignment of organizational values with employee expectations; job control; rewards; professional relationships and support; and work-life integration. These are consistent with the

external resources identified in the JD-R model and represent factors that organizational leaders may modify to prevent worker burnout and disengagement (Demerouti et al., 2001).

PA Occupational Model

Evaluating how the NAM conceptual model of clinician well-being can be applied to PAs first requires a review of the PA occupational model. PAs are licensed healthcare professionals who provide medical services in collaboration with a physician (AAPA, 2019a). PAs practice in all areas of medicine, from primary care to medical and surgical specialties. The broad general medicine curriculum on which PA training is based resembles an expedited version of that delivered to medical students (AAPA, 2019a). After graduation, PAs must pass a national certifying exam to apply for a state license to practice medicine. PA scope of practice includes diagnosing and treating both acute and chronic conditions in an "autonomous but not independent" (Dewan & Norcini, 2019, p. 951) manner. PAs can make autonomous medical decisions while maintaining a legally dependent relationship with a CP.

A variety of supervisory practices, determined at the state level, characterizes the physician-PA team (AAPA, 2019a). Each state sets the parameters and terminology for the PA-physician relationship, with some state practice acts referring to physicians as supervising and others as collaborating. For the purpose of this research, the physician component of the physician-PA team will be referred to as the collaborative physician (CP). Additionally, PAs are often referenced as part of a larger group of nonphysician healthcare providers, which may include advanced practice nurses of various

designations, such as nurse practitioners (NPs). Within the context of this research, when

PAs and other nonphysician healthcare providers are referenced, they will be collectively

referred to as advanced practice providers (APPs).

A hallmark of PA education is the expedited manner in which it is delivered. PAs

spend a mean of six years, including 45 weeks of supervised clinical training, in tertiary

training before entering the healthcare workforce (Dewan & Norcini, 2019). By

comparison, primary care physicians spend eight years, with 110 weeks of supervised

clinical training, completing their tertiary education before beginning the practice of

medicine. Two studies have evaluated PA readiness for practice upon graduation. In one

study using members of the AAPA Masterfile who graduated in 1978, 1988, and 1998,

Warner et al. (2013) found median time to perceived proficiency on their first job across

all groups was six months, with 84.7% of respondents reporting proficiency at 12 months.

Given the length of time since graduation for each cohort, ranging from 15 to 25 years,

respondent recall accuracy may have been problematic (Groves et al., 2009). In a study

of recent graduates, Polansky (2011) used the National Commission on the Certification

of PAs (NCCPA) database to select PAs who had taken their initial certifying exam

within the prior two years. The mean time in clinical practice for respondents was 10.4

months, indicating more reliable recall as compared to Warner et al.'s study. More than

half reported feeling "somewhat prepared" to assume clinical responsibilities upon

graduation (Polansky, 2011, p. 47). When asked how long it took for them to feel

proficient at performing all necessary clinical tasks, 48.6% reported six months. Those in

primary care settings reported feeling prepared sooner (25.1% at three months) than those

in specialty practice (12.3% at three months). Collectively, these findings indicate PA graduates require additional training upon graduation.

PAs have several postgraduate options for job-related learning. Within a sample of newly graduated PAs who practiced across a wide variety of specialties, when a patient care learning gap was encountered, 46.5% of the time respondents sought information from their CP, 21.8% of the time from medical reference resources, and 19.5% of the time from another PA or a NP (Polansky, 2011). This trend remains even among PAs who practice a medical specialty. In a study of PAs practicing emergency medicine (EM), a field comprising 13% of the PA workforce, most reported obtaining training for this specialty on-the-job (Kraus, Carlisle, & Carney, 2018). Formalized postgraduate PA training programs are available, though participation in one is not the norm (Polansky, 2011). At present, the membership roster of the Association of Postgraduate PA Programs (APPAP) includes 82 programs ranging in specialty from abdominal organ transplant and neonatology to family medicine and EM (Association of Postgraduate PA Programs, 2019). Regardless of postgraduate program availability, most PAs rely to a large extent on interactions with their CP to boost on the job learning.

The CP represents an essential resource for both new and established PAs. PAs consult with CPs about patient care and professional development on an as needed basis, though the percentage of time PAs consult with their CPs tends to decrease as PA experience level increases (Cawley & Bush, 2015). In one study on the topic, PAs practicing for 15 years or longer were more likely than those practicing for less years to report consulting with their CPs 10% of the time or less (Cawley & Bush, 2015). This

trend demonstrated variation by specialty, with primary care PAs reported less consultation sooner, as compared to EM PAs (Cawley & Bush, 2015). The decreased prevalence of consultation as experience increases has been termed "negotiated performance autonomy" (Cawley & Bush, 2015, p. 61) between a PA and CP, and represents an appropriate trajectory for PA professional development within the context of the physician-PA team.

In addition to expedited training and physician collaboration, the PA occupational model is also characterized by specialty mobility (Essary et al., 2018). Although training, experience, and health facility regulations also play a role, PA scope of practice is primarily determined at the state level, and all states allow for PA specialty change without additional training (American Academy of PAs [AAPA], 2019c). Warner et al. (2013) examined the specialty mobility of PA graduates from 1978, 1988, and 1998, and found the mean number of specialty changes among all three groups to be 1.95 per decade. Notably, PA graduates from later graduating classes demonstrated an increasing mean specialty change, with 1978 graduates changing 1.08 specialties per decade, 1988 graduates 1.51 specialties per decade, and 1998 graduates 2.41 specialties per decade. PA specialty mobility may represent an occupational resource reminiscent of autonomy and thereby may serve as a mediator of professional well-being.

Creators of the PA profession intended its collaborative and flexible nature to allow its members to fill the healthcare workforce shortage needs (AAPA, 2019a). Historically, PAs capitalized on a strong relationship with CPs and specialty mobility to allow for role expansion into areas of unfulfilled patient care needs. Role expansion for

PAs may manifest as increased clinical autonomy. Favorable safety outcomes of patients treated by PAs have been demonstrated in critical care, emergency, and primary care settings (Gershengorn et al., 2011; Pavlik, Sacchetti, Seymour, & Blass, 2017; Virani et al., 2018), lending credibility to PA clinical role expansion.

PA role expansion may also manifest as nonclinical responsibilities, such as serving on hospital committees, spearheading application of evidence-based guidelines or workflow improvement initiatives, managing departments or clinics, and developing and appraising other clinical and nonclinical staff (Pagel, 2015; Pastores et al., 2019; Wilson et al., 2019). Such expansion of nonclinical PA roles has demonstrated various outcomes. DePalma (2019) noted that APP turnover at Rush University medical facility decreased by 20% in the two years following the addition of PAs to the medical executive committee and other hospital governance groups. When given the opportunity, PAs in critical care settings have been found to be particularly effective at implementing evidence-based clinical guidelines (Pastores et al., 2019). Finally, among a sample of EM PAs, increased administrative responsibilities correlated with decreased burnout, possibly reflecting that the integration of leadership responsibilities with clinical duties may enhance PA well-being (Bell et al., 2002). In summary, through various aspects of role expansion, PAs may make a positive contribution in both clinical and nonclinical roles.

Applying the NAM conceptual model of clinician well-being to the PA occupational model validates the selection of job resources in this study. Because it is indicative of clinical competence, experience level may be considered an internal

resource a PA brings to the work environment. However, experience level may also be considered from the perspective of whether or not PA career stage matches current autonomy, framing it as an external organizational resource. In other words, a PA who has been practicing for one year may have less autonomy than a PA who has been practicing for five years. If autonomy does not increase with increasing experience, it may suggest inadequate organizational resources and may lead to burnout. In empirical literature, workload control has correlated with PA burnout (Benson et al., 2016) and as well as PA and NP satisfaction (Choi & De Gagne, 2016; DePalma et al., 2019; Nelson & Hooker, 2016). Considering this relationship, it is possible that autonomy may emerge as experience increases, leading to enhanced well-being.

Rewards are another organizational job resource represented in the NAM model (NAM, 2019). For PAs, the opportunity for promotion into leadership positions may represent a reasonable reward system. A lack of leadership opportunities may represent an inadequate reward system, thereby increasing the likelihood of burnout. While the influence of perceived leadership development opportunity on burnout or job satisfaction has not been examined among PAs, it has shown correlations with medical resident burnout (Anagnostopoulos et al., 2015), thereby validating its consideration as another potential mediator of experience level and professional well-being.

The CP relationship represents an important job resource for PAs (Polansky, 2011). In previous studies, aspects of the CP relationship have correlated with PA burnout (Bell et al., 2002; Tetzlaff et al., 2018). Given the intimate nature of physician-PA collaboration, the role of the CP may enhance or reverse job attitudes. For example, if

PA autonomy increases within the context of a positive CP relationship, professional fulfillment may increase, and burnout may decrease. However, if the relationship with a CP is negative, a PA may experience increasing clinical autonomy negatively, resulting in higher burnout and lower fulfillment. Similarly, taking on leadership responsibilities may be professionally fulfilling, unless the relationship with the CP is negative. Together, the JD-R theoretical model and the NAM conceptual model provide the foundation and framework, respectively, to conduct a quantitative examination using predictive analysis of the potential organizational antecedents to PA burnout.

Literature Review Related to Key Variables

Key variables in this study included domains of PA career development and professional well-being. Experience level, autonomy, and leadership responsibilities were considered as potential antecedents to professional well-being. Professional well-being was stratified into professional fulfillment and burnout.

PA Burnout and Professional Fulfillment

When compared to previous levels of burnout, current levels of burnout seen among members of the PA profession indicate that a problem may be emerging. A descriptive review of the AAPA 2018 annual salary survey, conducted among members of the AAPA Masterfile, revealed that 46.2% of respondents were exhausted at work, with 35% and 44% respectively reporting that physical and emotional exhaustion had *a lot* to *extreme* effect on their productivity (Smith, 2018). In spite of these levels of exhaustion, 80% reported moderate or complete agreement with feeling happy at work. Previous researchers have posited that positive aspects of professional well-being, such as

engagement, may exist at opposing ends of a dichotomous spectrum with burnout

(Stewart, Reed, Reese, Galligan, & Mahan, 2019). Trends in PA well-being literature do

not follow a dichotomous pattern, and instead, demonstrate that PAs can be both burned

out and satisfied at work.   In an analysis of AAPA salary survey data from 2016,

respondents reported moderate to high enthusiasm for work, but 32.2% of female

respondents and 25.6% of male respondents had reported that, in the past, they had quit a

job because of stress (Coplan et al., 2018). Interestingly, 14.3% of females and 10.2% of

males reported that they were currently thinking about quitting a job for the first time due

to stress. More than one-third (38.5%) of hospital and ambulatory care PAs and NPs in a

study of well-being demonstrated one symptom of burnout, with more than a quarter

(26.3%) reporting extreme fatigue (Dyrbye et al., 2019). Nearly one-third (31.5%)

reported moderate or greater likelihood of leaving their current position within two years

for a reason other than retirement. None of these studies used the same well-being scales,

so comparison across studies is not possible. However, trends related to levels of

exhaustion and intention to quit, present alongside relatively high professional

satisfaction indicators, were notable.

Earlier PA well-being studies were more heavily skewed toward the examination

of job satisfaction rather than the negative valences of professional well-being such as

burnout (Hoff et al., 2017). When compiling their narrative review of PA job satisfaction

studies published before 2010, Hooker et al. (2015) concluded that PAs were historically

satisfied with levels of autonomy, compensation, clinical decision-making responsibility,

physician support, and professional development. Hooker et al. noted an absence of job

satisfaction literature between 2010 and 2015 and theorized that after this timeframe, topics of study might have shifted more toward adverse job outcomes like burnout and intention to leave.   In a review of related literature published two years after Hooker et al., Hoff et al. (2017) found evidence that PA and NP role expansion could trigger job satisfaction, burnout, and intent-to-leave.   Unfortunately, the body of literature was characterized by variable measurement tools and simplified statistical models, making identification of trends difficult.

In spite of the challenges in distinguishing longitudinal patterns, PA burnout has consistently correlated with the type of medicine practiced.   As frontline providers of medicine, primary care clinicians have been examined in multiple studies.   Primary care PAs in one study demonstrated higher burnout levels and lower work-life balance when compared to specialty PAs, though mean burnout levels for all respondents were not reported (Sierra et al., 2019).   In a study of physicians, PAs, and NPs employed in smaller primary care clinics, or those with 10 or fewer providers, one in five reported symptoms of burnout (Edwards et al., 2018).   For PA and NP respondents, longer workweeks and being employed at a federally qualified health center (FQHC), both possibly reflective of more demanding circumstances, increased the likelihood of burnout.   In a general internal medicine setting, the odds of burnout for physicians and PAs increased accordingly with higher stress and lower work control and decreased as respondent value alignment with leadership increased (Linzer et al., 2016). Unfortunately, PA respondents in this study were too few to consider these findings generalizable.   Finally, among a sample of Air Force primary care physicians and PAs,

levels of either burnout and depression were medium to low and minimum to mild, respectively (Varner & Foutch, 2014). Together, these studies demonstrate that primary care settings characterized by higher demands and lower resources may preclude the development of higher levels of burnout.

PA burnout has also been studied among those practicing in specialty areas, none more frequently than EM. Data from the 2018 AAPA salary survey revealed that respondents who identified EM as their specialty demonstrated the highest levels of both burnout and professional fulfillment (Smith, 2018). Ashooh et al. (2019) examined burnout among EM PAs in a large urban department using the MBI and found significant differences in two burnout domains between PAs and a normative MBI sample. Mean depersonalization levels were one-third of a standard deviation higher, and mean emotional exhaustion levels were one-half of a standard deviation higher than those demonstrated in the normative sample. With only 21 respondents, the generalizability of findings is questionable. In a more extensive study of PA burnout that also used the MBI but also measured self-reported burnout, 59% of respondents demonstrated burnout on the emotional exhaustion subscale and 66% on the depersonalization subscale, while only 28.1% self-reported burnout. As with primary care, it is feasible that attributes unique to EM, such as fast pace, longer work hours, and night shifts, may lend themselves to the development of burnout.

Studies completed among PAs working in other specialties have revealed more favorable job attitude profiles. In a study of oncology PAs, levels of either emotional exhaustion or depersonalization, as measured by the MBI, reached criteria for burnout in

34.8% of respondents (Tetzlaff et al., 2018). In the same sample, mean career

satisfaction was measured at 84.8% and mean oncology specialty satisfaction at 88.8%.

Similarly, 87.3% of cardiovascular PAs surveyed by DePalma et al. (2019) using a

modified NP job satisfaction scale were either satisfied or very satisfied. In comparison

to physicians, orthopedic PAs in another study demonstrated significantly higher mean

satisfaction with lifestyle, agreed more that they would recommend their profession to

others, and disagreed more that their professional lives interfered with their personal lives

or contributed to any adverse health outcomes (Shannon & Merenstein, 2017). Findings

by Sierra et al. (2019), in which specialty PAs demonstrated higher levels of job

satisfaction than primary care PAs, are consistent with these studies. Overall, extant

literature paints the picture of higher job satisfaction among those in specialty practice.

Solely practicing in rural facilities may increase PA burnout levels. Almost two-

thirds of respondents from a quantitative study of rural PAs reported moderate to high

levels of emotional exhaustion and depersonalization (Benson et al., 2016). Significant

correlations were demonstrated between these levels of burnout and professional

isolation, adequacy of administrative support, and autonomy. Although satisfaction was

the only measure explored among rural PAs in another study, findings by Filipova (2014)

showed similar meaningful correlations between job satisfaction and autonomy, clinical

authority, and community, as well as the additional domain of relationship with CP.

Nelson and Hooker (2016) conducted a mixed methods study of Washington PAs and

NPs working in rural emergency departments and found that autonomy was a significant

job satisfier. These studies collectively indicate in low resource settings like rural clinics,

job resources such as autonomy and CP relationship may significantly contribute to PA professional well-being.

The experience of PA burnout has demonstrated differences across genders. In a quantitative analysis of 2016 AAPA salary survey data, female respondents rated all job stressors as more significant than male respondents, and more females had either in the past quit a job due to stress or were thinking about quitting a job due to stress for the first time (Coplan et al., 2018). In another quantitative study, male respondents demonstrated higher satisfaction levels than female respondents, although females were more likely to recommend the PA profession as a favorable career choice (LaBarbera, 2010). In a more recent evaluation, female respondents to a PA and NP well-being survey demonstrated a higher risk for burnout (Dyrbye et al., 2019). Among physicians, females are also more likely to experience burnout (Dyrbye et al., 2017). The consistency of the trend toward more significant burnout among females across healthcare workplace literature makes gender a viable control variable in the current study.

Experience Level

A gap in the research exists around the topic of how PA job attitudes are influenced by career length, as findings across studies have been variable (Hoff et al., 2017). Osborn et al. (2019) examined burnout among Minnesota PAs using the MBI, and discovered that as respondents' years of experience increased, so too did levels of depersonalization. Helfrich et al. (2014) examined burnout levels of clinical and nonclinical staff in VA primary care settings using the MBI emotional exhaustion subscale and found that longer tenure carried greater odds of burnout. In a quantitative

study of primary care providers in smaller clinics, those who had worked for more than three years at their current locations demonstrated a higher likelihood of burnout. However, this finding was only significant among physician respondents, and not among PAs or NPs (Edwards et al., 2018) A sample of emergency medicine PAs who completed the MBI and items on self-reported burnout, career length correlated with self-reported burnout but not measured burnout (Bell et al., 2002). With discrepant findings between self-reported and measured burnout observed in PA literature (Bell et al., 2002; Britt, Koranne, & Rockwood, 2017), the direct influence of experience level on burnout is difficult to interpret.

Researchers have found correlations between career length and other factors of professional well-being. For example, among rural PA respondents, those who had worked for *many years* both as a PA and at the same practice demonstrated higher satisfaction with the professional respect that they received (Filipova, 2014). In a literature review of European studies, Domagała et al. (2018) found that physician job satisfaction correlated with longer career lengths. Cawley and Bush (2015) reported that as the experience level of PAs survey increased, autonomy also increased. This is notable when considered alongside a study of NPs who demonstrated a positive correlation between reported levels of autonomy and job satisfaction (Choi & De Gagne, 2016). Collectively, findings correlating autonomy with experience intimate that professional well-being may be indirectly influenced by experience level, with autonomy as a mediator.

Other studies of healthcare providers have demonstrated a more direct relationship between mid-career and negative well-being indicators, with those practicing in the mid-career categories demonstrating discrepant levels of burnout as compared to those with younger and older careers (Dyrbye et al., 2017). In a study of early career pediatricians whose burnout was measured using a home-grown tool, those who had practiced at the same location for four or more years were more likely to experience burnout (Starmer, Frintner, & Freed, 2016). For another sample of physicians, nurses, and APPs, higher levels of moral distress, or the distress experienced when an individual is unable to act in a manner consistent with personal morals or principles, correlated with midcareer (Austin, Saylor, and Finley, 2017). In a recent national survey, which employed the PFI to measure well-being, practicing as a PA from five to nine years correlated with the highest rates of exhaustion and interpersonal disengagement, with 32.6% of respondents from this tenure category meeting criteria for burnout (Smith, 2018). Dyrbye et al. (2013) found a similar pattern among mid-career physicians, who demonstrated the highest levels of emotional exhaustion and overall burnout, as well as the lowest satisfaction with specialty choice and work-life balance. Dyrbye et al. asserted that this might be explained by middle career being characterized as a time when physician competency levels stabilize and job demands, such as extended workweek and overnight call, expand. The same may be true for mid-career PAs.

Autonomy

The correlation between autonomy and professional well-being has emerged in several PA studies. In a quantitative evaluation of the relationship between autonomy

and burnout of rural PAs, Benson et al. (2016) found a moderate negative correlation between workload control and emotional exhaustion, a weak negative correlation with depersonalization, and weak positive correlation with personal accomplishment. Filipova (2014) similarly reported that increased job satisfaction correlated with a decrease in the percentage of patients discussed with the CP, a trend indicative of higher PA autonomy. In a mixed methods study of PAs and NPs working in rural Washington emergency departments, 31% of respondents listed autonomy as a work setting benefit. Patterns from this research indicate that rural settings may enhance the role of autonomy as a buffer in the development of burnout for PAs.

The importance of autonomy may also vary according to specialty. In a multispecialty study examining levels of PA supervision, primary care PAs demonstrated the highest levels of self-reported autonomy (Cawley & Bush, 2015). Primary care respondents also reported earlier career emergence of autonomy, in comparison to respondents selecting EM as their specialty, signifying that primary care PAs may be socialized to expect more autonomy earlier in their career. In circumstances where this norm may not evolve, primary care PAs may experience decreased job satisfaction or increased burnout.

In spite of autonomy difference, PAs in specialty practices seem still to be positively influenced by higher levels of job control. Ashooh et al. (2019) took a more in-depth look at the job attitudes of EM APPs and found that job control was significantly and positively related to enhanced professional accomplishment. These findings are supported by those of Bell et al. (2002), who discovered that increased personal

accomplishment of EM PAs correlated with increased perceived autonomy. In a study of cardiovascular PAs using a tool validated only among NPs, DePalma et al. (2019) concluded that when compared to other job factors, those related to challenge and autonomy were most satisfying for respondents. Within more specialized practices, such as EM and cardiovascular medicine, autonomy may represent a job satisfier for PAs even when present at lower levels than those reported by primary care PAs.

Findings from studies of other types of healthcare workers validate the importance of work control on professional well-being. Linzer et al. (2016) found that poor work control was associated with burnout among a sample of general internal medicine physicians and APPs. In a mixed methods evaluation of healthcare workers who cared for adults with serious illness, autonomy emerged as an emotionally replenishing job factor, while the loss of decision-making authority emerged as an emotionally depleting job factor (Cain et al., 2017). Similar but in a different setting, physician respondents in a study by Weidner, Phillips, Fang, and Peterson (2018) who reported a broader scope of practice, possibly representing more job control, reported lower levels of burnout than those with more narrow scopes of practice. Livne and Goussinsky (2018) examined autonomy as a potential moderator of the relationship between workplace bullying and burnout and discovered that lower levels of autonomy were associated with higher levels of emotional exhaustion among those experiencing bullying at work. Among various types of healthcare workers, varying levels of autonomy have correlated in the anticipated direction with burnout and have also interacted with other job factors to predict burnout.

What is less evident in well-being research is if, and under what circumstances, increasing levels of autonomy might negatively influence professional fulfillment. In a review of research related to the working conditions of certified registered nurse anesthetists (CRNA), Boyd (2017) concluded that anesthesiologists might be threatened by expanded CRNA scope of practice, a circumstance that could create interpersonal work strain. A similar phenomenon is possible for PAs, whose relationships with CPs mirror to some extent those enacted between a CRNA and anesthesiologists. Faraz (2017) evaluated the experience of novice NPs as they transitioned from a nurse designation to the status of healthcare provider and concluded that autonomous decision making could be stressful when clinical self-efficacy was still developing. Because PAs and NPs undergo expedited clinical training as compared to physicians (Dewan & Norcini, 2019), autonomous decision making may also be challenging for new PAs. No association was found between autonomy and burnout among a sample of Greek medical residents, which Anagnostopoulos et al. (2015) explained by stating that their trainee status may have influenced the lack of salience placed on independent decision making. Similar to medical residents, new PAs have historically relied on interactions with CPs for professional development (Polansky, 2011), and in this context, autonomy may be less important than other factors, like interpersonal relations. More research is needed to determine if higher autonomy may serve as anything other than a job satisfier for PAs.

Leadership Responsibilities

Studies evaluating how leadership responsibilities may relate to the development of burnout or professional fulfillment among physician (Maza et al., 2016), nurse (Kelly

et al., 2019; Van Bogaert et al., 2014), and PA leaders are significantly lacking. Bell et al. (2002) found a correlation between decreased emotional exhaustion of EM PAs and increased administrative time, which researchers theorized may represent protected time away from the stresses of the emergency department. Beyond this, no other researchers have explicitly addressed either burnout or professional fulfillment among PA leaders.

 Limited evidence demonstrating that leadership roles may enhance physician well-being exists. In a scoping review of literature relating leadership and physician well-being, Montgomery (2016) asserted that certain aspects of leadership, such as enhanced autonomy and job meaningfulness, may be protective against the development of physician burnout. Similar conclusions were drawn by Domagała et al. (2018) in their review of European physician studies, which revealed that having either a leadership position or opportunities for professional development were both associated with higher satisfaction levels. Causality is problematic in both reviews, however, and at present, studies examining how leadership may predict physician well-being are inadequate.

Nursing literature reveals more empirical data regarding the wellness of leaders, though findings demonstrate variable relationships between aspects of leadership and well-being. For example, Van Bogaert et al. (2014) examined job satisfaction, work engagement, burnout, and turnover intention among nurse managers in Belgium, and found that respondents were more likely to be engaged than burned out. Alternatively, Warshawsky and Havens (2014) examined turnover intention among a sample of nurse managers in the United States and found that 62% were planning to leave their positions within five years, and 30% of these respondents selected burnout as the reason. Since

these studies were conducted in different countries, cultural differences may explain finding discrepancies.

One job factor that has correlated with poor leader well-being among physicians and nurses alike is a lack of leadership training. In a scoping review, Montgomery (2016) described the problematic experiences of newly graduated physicians, who may receive little to no leadership training as part of their medical training and still be expected to serve as leaders, navigating challenging medical circumstances. Like physicians, nurse graduates are expected early in their career to take on unit-level managerial roles, frequently in the absence of formal training (Ekström & Idvall, 2015). In their qualitative exploration of how new nurses in Sweden experienced these circumstances, Ekström and Idvall (2015) discovered themes of feeling unsupported, being uncertain of their responsibilities, and struggling with the delegation of work tasks to peers. Leadership responsibilities may also generate stress when clinically competent nurses with limited leadership experience are promoted into managerial positions, a circumstance that correlated with burnout in a mixed methods study of hospital nurse leaders within one health system in the United States (Kelly et al., 2019). Across physician and nurse studies, a lack of preparation for leadership roles correlates with negative job attitudes.

Investigations into PA leadership readiness have been limited. One national study conducted across 2015 and 2016 found that nearly three-quarters (72.8%) of PA respondents felt that they had the authority and competency necessary to lead or influence others (Wilson et al., 2019). Huckabee and Wheeler (2011) examined whether

or not PAs practicing in medically underserved settings had a higher likelihood of demonstrating servant leadership characteristics and found that all respondents, regardless of underserved practice designation, tended toward servant leadership. Beyond these two fragmented examinations of PA leadership perceptions and tendencies, further empirical investigations have been undertaken mostly from the perspective of barriers to PA leadership opportunities, such as a lack of qualifications (Noll & Oliphant, 2017), inadequate professional development funds (Wilson et al., 2019), or gender (Curtis, Dobbs, & Hildebrandt, 2017). More research is needed to understand how opportunities for leadership may influence PA job attitudes.

Several commentaries and reviews exploring the potential benefits of incorporating PAs explicitly, or APPs in general, into leadership positions exist. For example, DePalma (2019) shared an anecdotal correlation between a decrease in APP turnover by 20% over the two years following Rush University's appointment of PAs to the medical executive committee, hinting at the potential for PA leadership to decrease APP turnover but not confirming this with empirical evidence. Other articles have highlighted the benefit of PA involvement in strategic healthcare initiatives, such as workflow enhancement (Pagel, 2015), compliance with clinical guidelines (Pastores et al., 2019), and quality improvement (Boucher, McMillen, & Gould, 2015). Gillette et al. (2014) issued a call for leadership task shifting from physicians to PAs as a means of enhancing patient care on a global scale but provided no evidence for the readiness of PAs to accept such a challenge. Empirical studies confirming PA leadership outcomes

and correlating them with PA well-being are deficient, and additional research is warranted as PAs expand their leadership participation.

Relationship with Collaborative Physician

The heavy reliance on collaboration with CPs for on the job training, patient care coordination, and professional development (Polansky, 2011) may serve as a significant factor in PA well-being. Satisfaction with CP relationship emerged among 45 job factors as the fourth most significant job satisfier for cardiovascular PA respondents, although researchers employed a modified NP job satisfaction instrument that has not been validated among PAs to gather this data (DePalma et al., 2019). Because the relationship between NPs and physicians is not standardized in a similar manner as the physician-PA relationship, the use of this tool may have skewed the results. In fact, in a study of NP satisfaction by Athey et al. (2016), respondents without supervising physician relationships reported higher levels of satisfaction than those with such relationships. In light of this, comparing PAs to NPs or using tools validated only among NPs may be insufficient in drawing conclusions about the interaction of CP relationship and PA job attitudes.

Other PA studies have used the MBI, a widely validated burnout tool, and found positive associations between CP relationship and PA burnout. Decreased CP satisfaction among EM PA respondents in the study by Bell et al. (2002) correlated with increased emotional exhaustion, depersonalization, and self-reported burnout. It is worth noting that although self-reported burnout correlated with measured burnout, only 28% of respondents reported feeling burnt out at least part of the time. At the same time, 59%

and 66% met burnout criteria based on their responses to the emotional exhaustion and depersonalization subscales, respectively. These differences indicate that even the well-being of respondents who denied burnout but met MBI burnout criteria, correlated with CP satisfaction. Additionally, in a study of oncology PAs by Tetzlaff et al. (2018), respondents who selected *neutral*, *disagree*, or *strongly disagree* to statements about feeling valued, encouraged, and recognized by their CPs demonstrated a 7.85 times higher risk of meeting MBI burnout criteria. Though limited in number, findings from these studies present compelling evidence that how CPs manage and support PAs may represent a job resource, and as such CP leadership has the potential to influence PA engagement and well-being.

The way in which physicians are managed and supported also has implications for their well-being. In a quantitative study among Mayo clinic physicians, satisfaction with management by a physician supervisor positively predicted direct report physician job satisfaction, such that for every one-point increase in mean supervisor aggregate leadership score, the likelihood of job satisfaction for direct reports increased by 9.0% (Shanafelt et al., 2015b). The likelihood of burnout also demonstrated a 3.3% decrease per one-point increase in leadership score. Enhanced supervisor support similarly predicted lower emotional exhaustion among a sample of European transplant surgeons (Jesse, Abouljoud, Eshelman, De Reyck, & Lerut, 2017) and another sample of US medical residents (Okpozo, Gong, Ennis, & Adenuga, 2017). In the study of medical residents, higher perceived supervisor support mediated the relationship between ethical leadership behaviors and emotional exhaustion, while enhanced self-efficacy mediated

the relationship between ethical leadership behaviors and higher reported personal accomplishment. Even for physicians, perceived supervisor support may represent an important job resource that, if present at inadequate levels, may trigger burnout.

Factors related to team dynamics have also emerged as essential to the well-being of healthcare workers. Findings from a review of European physician satisfaction literature demonstrated support for the association between a positive team climate and greater job satisfaction (Domagała et al., 2018). Cain et al. (2017) used mixed methods to explore teamwork among a multidisciplinary sample of adult caretakers, which included lay healthcare workers, nurses, social workers, therapists, chaplains, and a pharmacist and found that close interprofessional collaboration and a shared commitment to patient care served to replenish them emotionally. Notably, close interprofessional collaboration and a shared patient care commitment characterize the ideal physician-PA team dynamic (AAPA, 2019a).

Collaboration across professional boundaries has revealed significant benefits for primary care teams, as well. Willard-Grace et al. (2014) examined the potential for a consistent care team structure, or one with the same provider and medical assistant dyad, to buffer the onset of emotional exhaustion among primary care physician, APPs, and staff, and found that perceptions of a healthier team culture had a more significant influence on well-being than did team composition consistency. Specifically, Willard-Grace et al. discovered that lower levels of emotional exhaustion correlated with both consistent team structure and team cultures characterized by high quality task-related and social interactions. However, teams with a consistent team structure remained at risk for

burnout if poor quality interactions characterized team culture. Such findings may be relevant to the quality of collaboration between a PA and CP, given the consistent nature of their team structure.

Summary and Conclusions

The demanding nature of the current healthcare workplace is not easily modified (NAM, 2019). However, organizations may interrupt the influence of workplace demands on healthcare worker burnout by enhancing available job resources. Theoretical and empirical literature regarding the JD-R model provides the predictive foundation on which to base the relationship between job resources and healthcare worker professional well-being. The NAM conceptual model of clinician well-being tailors the JD-R model to the work experience of healthcare workers like PAs.

Interpreted alongside both the JD-R and the NAM models, PA well-being literature supports the significance of experience level, autonomy, leadership responsibilities, and CP relationship as relevant job resources. Autonomy commensurate with training, and a favorable relationship with a CP has correlated with more favorable job attitude profiles. Questions exist around the relationship between experience level and burnout, with extant research demonstrating an increase of both measured and self-reported burnout that possibly peaks for PAs in their mid-career. Additional questions exist around the influence of leadership responsibilities on professional well-being, with current studies focusing more on barriers to PA leadership opportunities. Consistent trends seen among PA and physician research indicate that female PAs may experience higher levels of burnout, justifying the use of gender as a control variable.

The present research filled several existing gaps in PA professional well-being literature. First, predictive analysis of the relationship between PA experience level and burnout or professional fulfillment confirmed that increasing career length directly influences well-being, or indirectly through mediators related to PA career advancement. Second, this research showed under what circumstances levels of autonomy influenced PA professional well-being. Third, the predictive nature of expanding leadership responsibility on PA burnout or professional fulfillment, a topic absent from extant literature, was examined. Finally, the research demonstrated how a positive CP relationship, which has strong support in current literature for positively influencing PA well-being, moderated the stresses or rewards of PA career advancement. The collective contribution of this research improved the understanding of how PA role expansion within both clinical and nonclinical realms predicted PA professional well-being.

Chapter 3: Research Method

Introduction

The focus of this study was to test the JD-R model conceived by Demerouti et al., (2001) in the context of PA professional well-being. The goal was to determine if PA experience level, autonomy, leadership responsibility, and CP relationship predicted professional fulfillment or burnout. This chapter includes a review of the research design, methodology, and instrumentation used in the study. Also, the data analysis plan is outlined, including a discussion of threats to validity and ethical procedures.

Research Design and Rationale

As PA experience level increases, certain career characteristics should likewise increase as a reflection of career progression. For clinically active PAs, the degree of autonomy related to medical decision making should increase as their experience, and presumably clinical competence, increases (Cawley & Bush, 2015). For PAs with administrative responsibilities, the number of leadership tasks should also increase (Dorn, 2018). In the setting of such career development, as indicated by both enhanced autonomy and leadership responsibility, the quality of support from the CP may enhance PA well-being.

PA experience level was used as a predictor variable to examine the relationship between various dimensions of PA career progression and professional well-being (see Figure 1). The outcome variables were professional fulfillment and burnout. Autonomy and leadership responsibility were examined as potential mediators of the relationship between experience level and professional fulfillment and burnout. CP relationship was

examined as a potential moderator of the relationship between autonomy and professional

fulfillment and burnout, as well as between leadership responsibility and professional

fulfillment or burnout. Gender was used as a control variable.
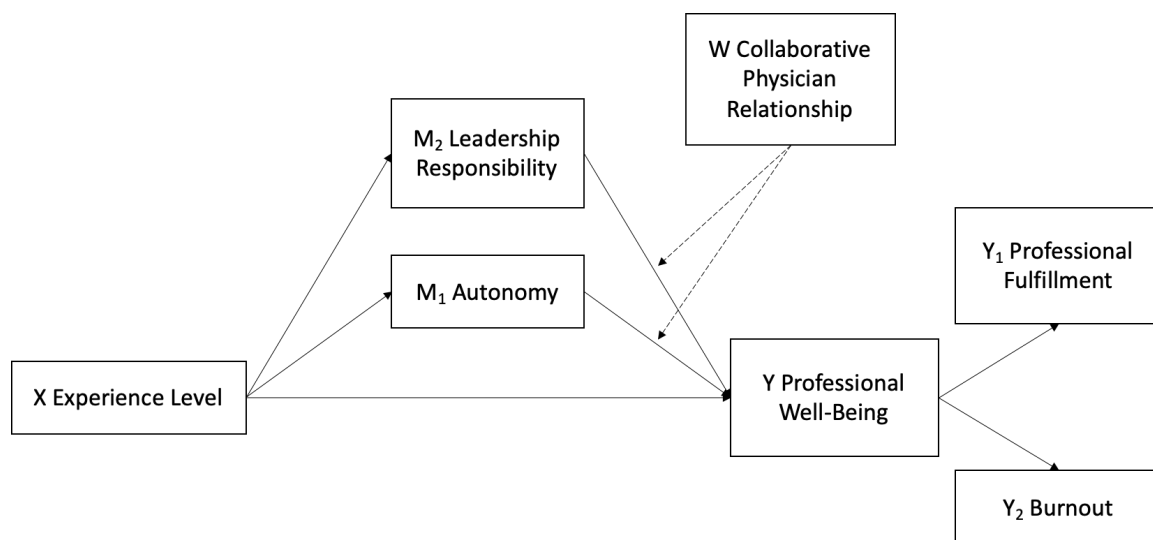
Figure 1. Conceptual diagram of the moderated mediation model with PA experience level (X) as the predictor variable, autonomy (M_1) and leadership responsibility (M_2) as the mediator variables, and collaborative physician relationship (W) as the moderator variable. Manifestations of professional well-being, or professional fulfillment (Y_1) and burnout (Y_2), are the outcome variables.

The research design for this study was quantitative and nonexperimental. An

archival dataset, gathered by the AAPA, was used to conduct the study. The archival data

file included all the measures being examined in this study, among others. Some of the

measures have been previously validated, others are single-item measures, and other

measures included items from the data file that were compiled into new subscales. These

aspects of the research design and methodology were appropriate for several reasons.

First, many previous studies on PA well-being have employed homegrown survey tools

(Filipova, 2014; LaBarbera, 2010; Nelson & Hooker, 2016; Shannon & Merenstein,

2017; Sierra et al., 2019). Among those that have employed previously validated tools,

many have been conducted among smaller, nonrepresentative samples of PAs (Ashooh et

al., 2019; Bell et al., 2002; Benson et al., 2016; Britt et al., 2017; DePalma et al., 2019;

Linzer et al., 2016; Osborn et al., 2019; Tetzlaff et al., 2018; Varner & Foutch, 2014).

Both of these circumstances make drawing comparisons of well-being across PA studies,

or between PA studies and those conducted among other types of healthcare

professionals, not feasible. Creswell and Creswell (2018) endorsed that conducting a

survey study among a larger, more representative sample, such as that used in the

archival dataset, may allow for conclusions to be generalized across a larger portion of

the population. Likewise, using a previously validated tool such as the one used in the

archival dataset allowed comparison across studies.

The current body of literature around the topic of PA professional well-being

lacked studies that employed robust statistical analysis, with most having used either

descriptive or correlational statistics only (Hoff et al., 2017). While experimental studies

provide the most accurate assessment of the relationship between variables (Creswell &

Creswell, 2018), the archival dataset for this study was collected by researchers at the

AAPA in a nonexperimental manner. As a proxy for experimental manipulation,

predictive analysis in the form of multiple regression was conducted. Hayes (2018)

endorsed that employing multiple regression analysis with mediation and moderation

allowed for predictive relationships to be identified in the absence of experimental

manipulation. In the context of a nonexperimental design, the statistical analysis

conducted in the study provided the opportunity to determine both the current state of PA

professional fulfillment or burnout, as well as potential antecedents to such job attitudes.

Finally, the current study provides a more reliable foundation on which future longitudinal studies may be based. By confirming relationships between autonomy, leadership responsibility, and CP relationship and varying levels and valences of PA professional well-being, the current study provided employers with occupation-specific data around which to design PA-tailored well-being interventions. Future researchers may use this study's conclusions to design longitudinal studies manipulating evidence-based antecedents to PA professional fulfillment or burnout and assessing resulting well-being levels across time. In these ways, principal aspects of the research design and methodology advanced knowledge in the area of PA professional well-being and also provided the groundwork for future experimental research.

Methodology

Population

The target population for this study was all PAs in the United States who are not currently retired. While some states allow PAs to practice without certification, the number of PAs certified by the NCCPA provides a reliable estimation of the total population of nonretired U.S. PAs (American Academy of PAs [AAPA], 2018). In 2018, the number of all certified PAs residing in the United States totaled 130,620 (NCCPA, 2019a). Regarding gender distribution, 68.8% of PAs certified in 2017 were female, and 31.2% were male. Comparing sample demographics to this data lent validity to study findings.

Sampling Procedures Using Archival Data

A dataset collected from members of the AAPA's master file was used to draw population-level conclusions about PAs. The 2018 salary survey was conducted to quantify salary and benefit trends, as well as to estimate professional well-being patterns among all PAs practicing in the United States in 2017 (AAPA, 2018). The AAPA research department conducts its annual salary survey in an online format, using email addresses from both its current membership list, as well as from nonmembers that they have on file (AAPA, 2018). Therefore, the sampling frame for this study was the AAPA's master file of PAs, which included both members and nonmembers who have not opted out of email communication.

The inclusion criteria for the salary survey were United States residence, nonretired status, and valid email addresses (AAPA, 2018). Exclusion criteria were PAs not based in the United States and who are retired. AAPA salary survey data collected in 2016 and used in another study on PA well-being yielded responses from respondents who were demographically similar to those represented in NCCPA reports and demonstrated a $\pm 0.72\%$ margin of error (Coplan et al., 2018). As such, datasets from previous iterations of the salary survey have demonstrated good representativeness.

The AAPA salary survey is distributed using various online venues. Members of the AAPA's master file are sent survey links via email (AAPA, 2018). Survey links are also posted on social media. For the 2018 version of the survey, data was gathered between February 2 and March 2, 2018, and items addressed practice conditions in 2017 (AAPA, 2018). Because it only targeted PAs in the United States, the AAPA's annual

salary survey sampling procedure represents purposive sampling. Although purposive

sampling may suffer from a lack of representativeness, it is useful in this case because the

research question is specific to PAs (Cox, 2016). To administer the survey among non-

PAs would produce uninformed and irrelevant responses.

Permission to use AAPA data is granted through an application process.

Researchers submit a request for data using a submission form found on the AAPA's

website (https://app.smartsheet.com/b/form/875701c52b9b4aa3aeb817afbbdbcd90).

Once this form is received, members of the AAPA research department send the

researcher an excel spreadsheet with a description of potential survey items available for

use. After reviewing this spreadsheet, the researcher completes a form requesting

specific survey items. Approval for release of specific items is sought from relevant

research stakeholders within the AAPA, and a letter of support is then provided, agreeing

to release data to the researcher for use in the dissertation process (Appendix A). As a

means of clarification, a phone call may also occur during the data release negotiation to

clarify the availability of necessary data, and a summary of requested items may be sent

in an excel spreadsheet format (Appendix B).

Using an archival dataset decreases certain resource constraints related to

conducting large scale survey research. The AAPA research department has already

collected the data, obviating the need for recruitment of study participants and

administration of the survey. The time and financial resources required are also

significantly decreased when using archival data. Once Walden's Institutional Review

Board granted approval (IRB), receipt and timely analysis of data, and interpretation of

results, ensued. In these ways, the use of archival data enabled a more efficient research timeline.

In spite of advantages, researchers using archival datasets must account for specific disadvantages. An overarching challenge with archival data is that it may have been collected with a purpose that is different from what may be intended during secondary analysis. As a result, the concepts and constructs used in the original research design may diverge from what is planned during the analysis of archival data (Kwiatkowska & Pouw, 2016). To reconcile these potential differences, the selection of AAPA salary survey items to represent constructs for the present study complied with how similar constructs have been operationalized in previous studies of the well-being of both PAs and healthcare providers.

Researchers using archival data are also accountable for the original research entity's methods of participant recruitment, data collection, and data storage, all of which have several important implications. First, the use of archival data typically requires a partner-site agreement with the entity who controls access to the data, which may leave the secondary researcher vulnerable to data access issues. Fortunately, the AAPA had already granted permission to access all necessary data at the onset of the current study (Appendix A).

Secondary researchers must also rely on the sampling methods used by the original research entity. If inadequate sampling frames were employed, for example, issues of representativeness may arise. Missing data secondary to nonresponse within the archival dataset can be misinterpreted (Kwiatkowska & Pouw, 2016). Proper data

cleaning techniques were employed and reported to maintain analysis transparency and avoid misinterpretation.

Finally, researchers using archival data must account for the ethical standards used by the original researchers to gather data. For example, the privacy standards laid out during initial data collection must be honored during secondary analysis, especially during the transfer of data between the original research entity and the secondary researcher (Heath, 2013). The AAPA maintains respondent privacy by providing only anonymous data for secondary use. For this study, data were analyzed and aggregated rather than evaluated on an individual level. Both of these practices served to protect respondent privacy while allowing for the potential emergence of meaningful population-level trends.

Power Analysis

Power analysis to determine a minimum sample size was done using G*Power 3.1 software. An a priori sample size for each path analysis of the linear regression with mediated moderation was calculated using a medium Cohen's f squared effect size of 0.15, an alpha error probability of 0.05, and a power of 0.80. Each path of the moderated mediation was calculated separately using one to three predictor variables, and then an overall model calculation was run using four predictor variables. Sample sizes ranged from 55 to 85. A sensitivity analysis was done to justify the effect size used to calculate each sample size. The sensitivity analysis comprised studies that have evaluated constructs similar to what is measured on the PFI, or professional fulfillment and burnout, and similar predictor variables to those planned for this study.

The first path focused on whether or not PA experience level predicts professional well-being. G*Power software calculated a sample size of 55 for this path using a medium effect size of 0.15, an alpha error probability of 0.05, a power of 0.80, and one predictor. This effect size was supported by a study done by Osborn et al. (2019) using the MBI to evaluate burnout, job satisfaction, and career flexibility among PAs in Minnesota. Using Osborn et al.'s sample size of 312, the number of predictor variables as 1, an alpha error probability of 0.05, and a power of 0.80, the calculated Cohen's f squared achieved for the study was 0.025.

The first mediated path focused on whether or not PA autonomy mediates the relationship between PA experience level and professional well-being. G*Power software calculated a sample size of 68 for this path using a medium effect size of 0.15, an alpha error probability of 0.05, a power of 0.80, and two predictors. This effect size was supported by several studies. First, Livne and Goussinsky (2018) examined the influence of workplace bullying on burnout among two samples, one of healthcare employees and another of bachelor's students in a healthcare administration program. Livne and Goussinsky found a correlation between emotional exhaustion and depersonalization scores on the MBI and job autonomy. Using Livne and Goussinsky's first sample size of 309, number of predictor variables as 1, an alpha error probability of 0.05, and a power of 0.80, the calculated Cohen's f squared for the study was 0.026. Using Livne and Goussinsky's second sample size of 105, number of predictor variables as 1, an alpha error probability of 0.05, and a power of 0.80, the calculated Cohen's f squared for the study was 0.076. Depalma et al. (2019) also found correlations between

autonomy and the job satisfaction of PAs practicing cardiovascular medicine. Using

Depalma et al.'s sample size of 79, number of predictor variables as 1, an alpha error

probability of 0.05, and a power of 0.80, the calculated Cohen's f squared for the study

was 0.102. Achieved effect sizes for both of these studies fall below the medium effect

size used to calculate the sample size for the current study.

The second mediated path focused on whether or not PA leadership responsibility

mediates the relationship between PA experience level and professional well-being.

G*Power software calculated a sample size of 68 for this path using a medium effect size

of 0.15, an alpha error probability of 0.05, a power of 0.80, and two predictors. This

effect size is supported by Depalma et al. (2019), who found a correlation between

professional development opportunities and the job satisfaction of PAs practicing

cardiovascular medicine. The achieved effect size of 0.102 was found using similar

parameters as those used to calculate the mediated autonomy path in Depalma et al.'s

study.

The moderated mediation path focused on whether the quality of the relationship

with a CP moderates the mediation of either autonomy or leadership responsibility on the

relationship between experience level and PA professional well-being. G*Power

software calculated a sample size of 77 for each moderated mediation path using a

medium effect size of 0.15, an alpha error probability of 0.05, a power of 0.80, and three

predictors. This effect size is supported by two studies. First, Tetzlaff et al. (2018)

examined the antecedents to burnout among oncology PAs and found a correlation

between total burnout score and composite CP leadership score. Using Tetzlaff et al.'s

sample size of 250, number of predictor variables as 1, an alpha error probability of 0.05, and a power of 0.80, the achieved effect size for the study was 0.032. Depalma et al. (2019) examined job satisfaction of cardiovascular PAs and discovered a correlation with CP relationship. The calculated Cohen's f squared for this was 0.102 using similar parameters as those used to calculate the mediated autonomy path in Depalma et al.'s study. Achieved effect sizes in the studies by Tetzlaff et al. and Depalma et al. support the use of a medium effect size to calculate the sample size of the present study.

Instrumentation and Operationalization of Constructs

This study addressed the relationship between PA experience level and professional well-being, and whether autonomy or level of leadership responsibility served as mediators. Additionally, the relationship with a PA's CP was evaluated as a potential moderator. Each variable was operationalized within the context of the JD-R model and measured using items in an archival dataset.

Outcome Variables. The outcome variables were professional fulfillment and burnout. Professional fulfillment describes the intrinsic positive experience that results from a job that is rewarding, engaging, and meaningful, among other positive attributes (Trockel et al., 2018). Burnout describes a negative affective state characterized by decreased physical and emotional energy and disengagement from patients and colleagues (Trockel et al., 2018). The JD-R model suggests that excessive job demands can lead to burnout, while a lack of job resources can lead to disengagement (Bakker & Demerouti, 2007). Additionally, the JD-R model suggests that high job demands can be

buffered by high job resources to trigger engagement, which is an essential aspect of professional fulfillment.

The PFI was used in the current study to measure professional fulfillment and burnout (Trockel et al., 2018). The PFI has three subscales, a total of 16 items, and takes on average three minutes to complete. The PFI is an open-source scale that does not require permission or payment to use. It has two subscales, with one measuring professional fulfillment and the other measuring the burnout dimensions of work exhaustion and interpersonal disengagement. The professional fulfillment subscale includes six items. The instructions read: "How true to you feel the following statements are about you at work during the past two weeks?" and a sample item is *My work is satisfying to me*. The five-point response scale includes options from *not at all, somewhat true, moderately true, very true,* and *completely true*. Increasing scores indicate increasing levels of fulfillment in the form of higher happiness, satisfaction, and meaning, as well as a greater sense of worthiness, control, and professional contribution.

The overall burnout score was calculated using the results from the PFI's work exhaustion subscale, together with the interpersonal disengagement subscale (Trockel et al., 2018). The work exhaustion subscale has four items. The instructions read: "To what degree have you experienced the following?" and a sample item is *During the past two weeks I have felt lacking in enthusiasm at work*. Response options are: *not at all, very little, moderately, a lot*, and *extremely*. Increasing scores indicate increasing physical and emotional exhaustion, decreasing enthusiasm, and an increasing sense of dread. The interpersonal disengagement subscale includes six items. The instructions

read: "To what degree have you experienced the following?" and a sample item is *During the past two weeks I have felt less empathetic with my patients*. Response options are: *not at all, very little, moderately, a lot*, and *extremely*. Increasing scores indicate lower levels of engagement, empathy, sensitivity to others' feelings, interest in and connection with patients and colleagues. The two subscales are scored separately by averaging responses to each item (Trockel et al., 2018).

Creators of the PFI established its validity in several ways. First, its face and content validity were confirmed by pilot testing and expert review (Trockel et al., 2018). Convergent validity was established by comparing PFI results from 250 physicians and medical residents at one medical facility against results from conceptually similar subscales of the MBI-Human Services Survey (HSS; Trockel et al., 2018). Moderately strong correlations emerged between the PFI work exhaustion subscale and the MBI-HSS emotional exhaustion subscale (Cronbach's α = 0.72); between the overall PFI burnout score and a compilation of the MBI-HSS emotional exhaustion and depersonalization subscales (Cronbach's α = 0.71); and between the PFI interpersonal disengagement subscale and the MBI-HSS depersonalization subscale (Cronbach's α = 0.59). Concurrent validity was established in the same sample of respondents using Pearson's correlation between the PFI and the one item self-defined measure of burnout; self-reported medical errors; a scale measuring patient reported outcomes related to sleep-related impairment, depression, and anxiety; and the WHO's Quality of Life (QOL-BREF) assessment survey. All correlations were statistically significant. In all aspects, the PFI demonstrated robust validity.

Internal reliability of the PFI has been established in three studies. First, in the seminal study in which the PFI was administered among a sample of physicians and medical residents at one facility practicing across various specialties, Trockel et al. (2018) calculated Cronbach's α scores for the work exhaustion subscale (0.86), the interpersonal disengagement subscale (0.92), the overall burnout score (0.92), and the professional fulfillment subscale (0.91). Zhang et al. (2019) used the PFI to measure professional fulfillment and burnout among a sample of breast surgeons, and Cronbach's α for the professional fulfillment, work exhaustion, and interpersonal disengagement subscales were 0.9, 0.87, and 0.92 respectively. In another study of physicians practicing across various specialties and at various facilities, Cronbach's α for overall burnout was 0.94, while internal reliability of the other subscales was not mentioned (Trockel et al., 2019). Taken together, Cronbach's α scores from these studies indicate that the PFI consistently demonstrates good internal reliability.

Predictor Variable. The predictor variable *experience level* was used as an indicator of career progression. Other studies examining the influence of experience level on professional well-being have used variable definitions of early-, mid-, and late-career (Dyrbye et al., 2013; Starmer et al., 2016; Weidner et al., 2018). In light of such inconsistency, PA experience level was utilized as a continuous variable for this study.

The validity of this item as a measure of career progression was established in previous studies of the relationship between both PA and physician career stages and dimensions of well-being. Bell et al. (2002) examined career length as a potential correlate with burnout in a study of emergency medicine PAs. In a study of Minnesota

PAs, Osborn et al. (2019) discovered that as career length increased, levels of depersonalization as measured by the MBI also demonstrated a statistically significant increase. Early career physicians in a study by Dyrbye et al. (2013) demonstrated the lowest levels of satisfaction with career choice, while mid-career physicians demonstrated the highest levels of emotional exhaustion and overall burnout. From a slightly different perspective, pediatricians who had been practicing for at least four years in their current position demonstrated the highest levels of burnout in a study by Starmer et al. (2016). In each of these established studies, career length has emerged as a relevant predictor of well-being.

Mediator Variables. Autonomy and leadership responsibility were examined as potential mediators of the relationship between experience level and professional fulfillment and burnout. Both the JD-R model and the NAM categorize these variables as potential job resources that, if present at inadequate levels, may lead to burnout (Bakker & Demerouti, 2007; NAM, 2019). PAs practice within the context of "negotiated performance autonomy" (Cawley & Bush, 2015, p. 61) with their CP. In this model, as experience level and skill increase, a negotiation of increased job control at the CP, organizational, and regulatory levels occur. Ideally, the negotiation results in enhanced PA autonomy. As such, autonomy was evaluated as a potential mediator of the relationship between career stage and professional well-being.

Autonomy was measured with a single-item from the AAPA 2018 salary survey. The item was *What percentage of your clinical time do you spend consulting with your CP.* It was collected as a continuous variable in the form of a raw percentage. Two

studies have similarly addressed PA autonomy, as is intended in this study. Cawley and

Bush (2015) framed the discussion of PA autonomy from the perspective of the

percentage of patients discussed with a CP. They found that among a group of

multispecialty PAs, as experience level increased, this percentage decreased, though the

trend was accelerated for primary care PAs as compared to specialty PAs. Filipova

(2014) measured job satisfaction among rural PAs using a homegrown survey that was

compiled using factor analysis and predictive statistics. Filipova also measured other

aspects of PA autonomy, such as range of allowed practice activities, having advanced

prescriptive authority, and having clinical decision-making autonomy. Still, only the

percentage of patient load not discussed with CP demonstrated meaningful and

significant correlations with job satisfaction.

The potential mediator of leadership responsibility was represented as an

aggregated score or composite indicator (CI; Dialga & Thi Hang Giang, 2017) of

increasing numbers of leadership-related tasks. The 2018 AAPA salary survey included

a list of 13 leadership responsibilities that respondents were asked to identify as having or

not having. Task options on the survey included the following: committee, hire/fire,

performance assess, competency assess, PA credentialing, determine workforce

requirement, manage PAs or other clinical staff, manage nonclinical staff, ensure

accreditation compliance, budget, educating others, and quality improvement activities.

Leadership tasks were aggregated into a CI of leadership tasks to distinguish

increasing levels of leadership responsibility between respondents. CIs are aggregated

representations of multiple dimensions of one construct and include variables that are the

most theoretically relevant to the domain (Dialga & Thi Hang Giang, 2017). The 13

leadership tasks listed in the AAPA 2018 salary survey encompass core components of

PA leadership. As frontline providers of medical care, PAs are well-positioned to

improve transactional aspects of healthcare delivery, such as workflow efficiency, quality

improvement, and workload management of clinical and nonclinical staff (Gershengorn

et al., 2011; Pagel, 2015). Additionally, by having an intimate understanding of their

occupational model, PAs have much to contribute in the realm of regulatory and

accreditation adherence, as well as performance and competency assessment of other PAs

(DePalma, 2019). As such, the tasks listed in the AAPA 2018 salary survey are valid

indicators of PA leadership responsibility.

Each task identified on the AAPA salary survey represents a different dimension

of leadership, and the more tasks selected by an individual respondent, the higher their

level of leadership responsibility. For example, a respondent with a composite leadership

score of two will have less responsibility than a respondent with a composite score of six.

By aggregating leadership responsibilities into one score that can be used as a continuous

variable, the influence of increasing leadership responsibilities on PA well-being was

determined.

Moderator Variable. The potential moderator of relationship with CP

represented how well CPs manage PAs. Having a relationship with a CP is one

consistent factor across all PA occupational models (AAPA, 2019b), and as such, may

have the potential to influence the relationship between potential mediators of PA well-

being, such as autonomy and leadership responsibility. The use of CP relationship as a

valid predictor of well-being has been established in previous studies of both physicians and PAs. Satisfaction with management by a physician supervisor positively predicted physician job satisfaction and negatively predicted burnout (Shanafelt et al., 2015b). For PAs, the relationship with their CPs has correlated with professional well-being in previous studies (Bell et al., 2002; Benson et al., 2016; Filipova, 2014; Tetzlaff et al., 2018). For this study, a single item was used to evaluate perceptions of the CP relationship. The item was *Rate your relationship with your collaborating physician*, and response options include *extremely positive, somewhat positive, neither positive nor negative, somewhat negative*, and *extremely negative*.

Several additional variables were collected. Gender was used as a control variable. An item inquiring into whether respondents switched jobs or specialties within the last year was also collected and used as a control variable. Being new to a job or specialty may confound professional well-being through emerging self-efficacy or experiences with onboarding policies. Finally, race and ethnicity, specialty, setting, and the number of total jobs were collected and represented as demographic data.

Data Analysis Plan

Statistical analysis was accomplished using SPSS version 25. The original research entity completed data cleaning. Before dataset release, members of the AAPA research department screened for and removed items with missing responses. The salary survey is also programmed at the response level for responses to fit within two standard deviations of the mean, verifying that each response within a real limit (N. Smith, personal communication, December 12, 2019).

Research Questions and Hypotheses

Archival data gathered in 2018 by the AAPA were used to consider the following research questions and hypotheses:

Research Question 1 (RQ1): Does PA experience level predict professional well-being?

Null Hypothesis ($H_0$1): PA experience level does not significantly predict professional well-being, as measured by the PFI.

Alternative Hypothesis (H_a1): PA experience level significantly predicts professional well-being, as measured by the PFI.

Research Question 2 (RQ2): Does PA autonomy mediate the relationship between experience level and professional well-being?

Null Hypothesis ($H_0$2): PA autonomy, as measured by the single autonomy item, does not significantly mediate the relationship between experience level and professional well-being, as measured by the PFI.

Alternative Hypothesis (H_a2): PA autonomy, as measured by the single autonomy item, significantly mediates the relationship between experience level and professional well-being, as measured by the PFI.

Research Question 3 (RQ3): Does PA leadership responsibility mediate the relationship between experience level and professional well-being?

Null Hypothesis ($H_0$3): Leadership responsibility, as measured by the composite leadership score, does not significantly mediate the relationship between experience level and professional well-being, as measured by the PFI.

Alternative Hypothesis (H_a3): Leadership responsibility, as measured by the composite leadership score, significantly mediates the relationship between experience level and professional well-being, as measured by the PFI.

Research Question (RQ4): Is the relationship between PA autonomy and professional well-being moderated by the quality of the CP relationship?

Null Hypothesis 4 (H_04): The quality of the CP relationship, as measured by the single CP relationship item, does not significantly moderate the relationship between PA autonomy as measured by the single autonomy item, and professional well-being, as measured by the PFI.

Alternative Hypothesis (H_a4): The quality of the CP relationship, as measured by the single CP relationship item, significantly moderates the relationship between PA autonomy, as measured by the single autonomy item, and professional well-being, as measured by the PFI.

Research Question 5 (RQ5): Is the relationship between PA leadership responsibility and professional well-being moderated by the quality of the CP relationship?

Null Hypothesis (H_05): The quality of the CP relationship, as measured by the single CP relationship item, does not significantly moderate the relationship between PA leadership responsibility, as measured by the composite leadership score, and professional well-being, as measured by the PFI.

Alternative Hypothesis (H_a5): The quality of the CP relationship, as measured by the single CP relationship item, significantly moderates the relationship between

PA leadership responsibility, as measured by the aggregate leadership score, and professional well-being, as measured by the PFI.

Analysis Plan

Descriptive analysis of personal and professional characteristics of respondents to the 2018 AAPA salary survey was conducted using standard descriptive statistics. Means and standard deviations were calculated for both outcome variables and all predictor variables, including the potential mediators, moderators, and control variables, to verify adequate range and normal distribution (Warner, 2013). Pearson's correlations were calculated for dyads of predictor variables, including the mediator and moderator variables, as well as between each predictor variable and each outcome variable. Bivariate linear regression was conducted to evaluate the direct effects of the predictor variable, and each potential mediator and moderator variable, on the outcome variables, controlling for gender, and recent employer or specialty change.

Criteria for professional fulfillment and burnout followed previously established parameters. These parameters were calculated by comparing the sensitivity and specificity of the PFI alongside other measures of professional fulfillment and burnout (Trockel et al., 2018). Criteria for high professional fulfillment was an average item score of 3.0 or greater on the professional fulfillment subscale, and overall burnout was diagnosed based on an average item score of 1.33 or greater on both the work exhaustion and interpersonal disengagement subscales.

Multiple linear regression with mediation and moderation was conducted to determine the influence of autonomy, leadership responsibility, and CP relationship on

the association between experience level and PA professional fulfillment or burnout, controlling for gender, and recent employer or specialty change. Gender has consistently produced statistically significant differences among samples of PAs regarding various well-being indicators. Males and females have ranked differently in levels of job satisfaction (LaBarbera, 2010) and work-related distress (Dyrbye et al., 2019), appraisal of stressors, and reasons for turnover (Coplan et al., 2018), making gender an appropriate control variable.

Using moderated multiple regression analysis made it possible to determine if a moderating variable can strengthen the relationship between a predictor variable and an outcome variable, or change the direction of the relationship (Baron & Kenny, 1986). Other professional well-being studies based on the JD-R model have used moderated multiple regression to examine relationships between variables. For example, Karaeminogullari et al. (2018) conducted a moderated multiple regression to determine if job resources moderated the relationship between patient mistreatment and poor health outcomes among frontline healthcare workers. Karaeminogullari et al. discovered that the interaction of deep acting, an emotional labor strategy, and patient or family mistreatment negatively and significantly predicted depersonalization among respondents. Viotti et al. (2015) also used the JD-R model to ground their evaluation of whether certain types of job resources influenced the relationship between verbal aggression from patients and burnout among nurses and nurse's aides. Statistical analysis demonstrated support for the buffering potential of job resources, in that job content level resources like autonomy lessened the influence of verbal aggression on burnout for

nurses. For nurse's aides, organizational level resources like supervisor support and fairness had a buffering effect. Moderated multiple regression allows for discrimination between job resources that influence the well-being of healthcare workers.

Combining mediation and moderation allows researchers to determine if a moderating variable is capable of changing the influence of a mediating variable on an outcome variable (Hayes, 2018). Brough, Drummond, and Biggs (2018) based their longitudinal study of police-service worker well-being on the job-demands-control-support model, a theory similar to the JD-R model, and used a moderated mediation analysis. The statistical model tested the role of supervisor support and job control as potential moderators of the relationship between job demands and well-being, as mediated by different types of coping mechanisms. Consistent with what was anticipated, Brough et al. found that specific coping mechanisms mediated the relationship between cognitive job demands and work engagement when supervisor support was low. However, surprisingly, Brough et al. also found that in the presence of cognitive dissonance as a job demand, accommodating coping mechanisms mediated higher levels of work engagement when supervisor support was low, and job control was high. Such a robust statistical analysis allowed determination of complex and nuanced findings and was repeated in the current study toward a similar end.

Threats to Validity

Aspects of the study design presented threats to external, internal, and construct validity. Threats to external validity encompass factors that may prevent study conclusions from being generalized to all members of an intended population (Torre &

Picho, 2016). Internal validity speaks to the level of accuracy with which conclusions

can be drawn about the relationships examined in the study (Torre & Picho, 2016).

Construct validity describes how well a survey tool reflects the full spectrum of

underlying constructs that it is meant to measure (Groves et al., 2009; Schaufeli &

Enzmann, 1998). Steps were taken in this study to mitigate threats to each type of

validity.

Threats to External Validity

Aspects of response bias, or how respondents answer questions, may threaten

external validity. Social desirability is one such example and describes respondent

tendency to either avoid reporting attitudes or behaviors that they deem socially

unattractive or to overestimate those that are more socially attractive (Groves et al.,

2009). For healthcare workers, social desirability may manifest as overreported levels of

meaningful work, and underreported levels of disinterest in patients.

The study design lent itself to less social desirability. The AAPA conducts the

survey in a self-administered, online format, in which respondents can take the survey in

a private setting of their choice. This manner of survey administration is both

economical and efficient (Groves et al., 2009). It also provides sample members with

privacy while completing the survey, which may decrease the likelihood of social

desirability bias (Groves et al., 2009). The informed consent section states that the data is

collected confidentially and stored in a secure network. The consent also mentions that

responses are not linked to member records and are reported as aggregated statistics,

rather than as an individual-level analysis. Respondents are notified that data may be

released to secondary researchers and reassured that this process is done in a de-identified manner. Finally, respondents have the option to select "I prefer not to answer" as a response option or to skip any question. Each of these provisions of respondent privacy and control may motivate them to answer with more accuracy and honesty.

Threats to Internal Validity

Factors that may have threatened internal validity included weak statistical analysis, survey fatigue, nonresponse bias, coverage error, and self-selection bias. The less robust the statistical analysis, the less internally valid a study may be (Hoff et al., 2017). To overcome this, the current study employed predictive, rather than only descriptive or correlational, analyses. Longer surveys carry a higher risk that items asked later in the survey will trigger inaccurate responses (Egleston, Miller, & Meropol, 2011). The AAPA salary survey takes 15-20 minutes to complete, a length that may trigger survey fatigue. However, because an archival dataset will be used for analysis, survey length was not modifiable.

The online nature of the survey may also have threatened internal validity. In spite of their enhanced privacy, online surveys have demonstrated lower response rates than paper and pencil surveys, and as such, may suffer from nonresponse bias and coverage bias (Heerwegh & Loosveldt, 2006).   Nonresponse suggests that sample members did not complete the survey as a unit or failed to complete items within the survey, and bias results by virtue of the data not including the non-responder perspective. Unfortunately, like survey fatigue, nonresponse bias was also not modifiable.

The archival dataset was also at risk for coverage bias, which describes differences between the intended population and the sample (Groves et al., 2009). The target population for this study comprised all PAs in the US who are not currently retired, however the sampling frame is the AAPA master file (AAPA, 2018). The master file may not have included those practicing PAs who have never joined the AAPA, or whose email addresses are outdated. This threat was overcome by comparing sample demographics with the NCCPA profile on all certified PAs.

Self-selection bias describes the difference between those who take the survey and those who do not (Bjertness et al., 2010). If a disproportionate number of certain sample members, such as PAs who practice in outpatient as opposed to inpatient settings, completed the survey, findings may have been skewed. Self-selection bias leads to decreased representativeness between sample outcomes and population outcomes (Laerd Dissertation, 2012). A comparison of sample demographics with those of the NCCPA profile of certified PAs revealed to what extent self-selection bias may have influenced outcomes of the current study.

Threats to Construct Validity

The major constructs in the current study were PA professional well-being and career development. Each construct was operationalized and measured using items from the 2018 AAPA salary survey. Conceivably, these items may not have represented the full spectrum of PA professional well-being or career development, which may have threatened the study's construct validity. Single-item measures, such as those that were used to measure autonomy and CP relationship, are particularly vulnerable to poor

construct validity (Laerd Dissertation, 2012). A composite leadership score was created

to estimate respondent leadership responsibility, which may have oversimplified the

concept of leadership responsibility (Schaufeli & Enzmann, 1998). Together, these

conditions may have led to underrepresentation or biased sampling of study domains

(Downing & Haladyna, 2004).

Threats to construct validity was addressed in several ways. First, both outcome

variables were measured using the PFI, which was included as part of the 2018 AAPA

salary survey. Trockel et al. (2018) previously established the construct validity of the

PFI. Predictor variables were operationalized in a manner similar to those featured in

previous PA well-being studies. For example, autonomy has previously been described

as the percentage of patients that PAs discuss with their CPs (AAPA, 2018), making it a

valid item for use in the current study. Other PA well-being studies have examined the

relationship with CP (Bell et al., 2002; Tetzlaff et al., 2018), also validating its use in the

current study. Finally, PA career development was operationalized from multiple

perspectives, or from career length, clinical autonomy, and leadership responsibility. By

utilizing multiple variables to quantify various dimensions of PA career development, the

representativeness of the domain increased.

The greatest threat to construct validity involved the measurement of PA

leadership responsibility. An examination of how leadership responsibility influences the

well-being of physician and nurse leaders is underrepresented in current literature (Kelly

et al., 2019; Maza et al., 2016; Van Bogaert et al., 2014), and all but absent in regards to

PA leaders. Wilson et al. (2019) examined the relationship between PA career

satisfaction and funds available for professional development but did not incorporate leadership responsibility into the analysis. As such, similarly operationalizing the leadership responsibility construct with other studies was not feasible.

In the present study, leadership responsibility was analyzed as a CI, totaling all leadership tasks selected by each respondent. Although a leadership CI calculated in this manner may represent a viable proxy for increasing levels of responsibility, aggregation may result in a loss of valuable information related to individual factors (Schaufeli & Enzmann, 1998). For example, a PA with a composite leadership score of one may have the responsibility to "hire and fire," the well-being implications of which are different from another PA with a composite score of one whose responsibility is to "educate others." In both of these cases, information about the type of leadership responsibility was not factored into the resulting well-being outcome.

To overcome the threat to construct validity posed by the leadership CI, results were interpreted in the context of its limitations. At its core, validity speaks to "the interpretations of test scores for proposed uses that are evaluated, not the test itself" (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 2014, p. 11). As such, findings related to the leadership responsibility score were interpreted alongside a discussion of how the aggregation of leadership tasks may have confounded outcomes. Construct clarity was expounded upon, and any call for future application of findings were elucidated together with disclosures of potential measurement error stemming from aggregation.

Ethical Procedures

The Walden University Institutional review board (IRB) approved this study. An archival dataset was used to conduct the research. Ethical procedures in place at the time of data collection included several best practices. For example, before participating, respondents gave informed consent. A part of this procedure included notification that participation was voluntary and could be terminated at will at any time. Respondents were informed that only demographic information, but not compensation or benefits information, would be linked to applicable member profiles. The AAPA also disclosed that data would be stored on a secure local network and reported only as accumulated totals, rather than as individual-level statistics. Finally, respondents were notified of the potential for the data to be provided to researchers as password-protected, de-identified datasets.

Beyond the voluntary and confidential nature of the research, respondent participation included incentives but not support services. Respondent incentives included a free copy of the subsequent AAPA Salary Survey Report, which is free to AAPA members and can be purchased for $200 by others, and the chance to win a $50 Amazon gift card. Respondents were not offered counseling or other services in the event that participation caused them personal harm. Unfortunately, because the data has already been collected, an omission of support services is not modifiable.

An additional ethically important component of the present study is the potential for conflict of interest. I used a dataset that originated from the same entity as is providing my research funding. I received a one-year research fellowship, which runs

from November 1, 2019, to October 31, 2020, from the AAPA. The funding, which is equivalent to 20% of my salary, was provided by the AAPA directly to my employer under the auspices that I will be released from job responsibilities one day per week to pursue PA-specific research. I used this protected time to pursue multiple scholarly activities, including work on the current study.

I took several steps to avoid any conflicts of interest related to my research fellowship. First, I maintained transparency in the research process by disclosing all research-related conversations with the AAPA to the chair of my dissertation committee. I also used the relationship with my research fellowship mentor, who was a 2017-2018 research fellow but has no current affiliations with the AAPA, to validate the integrity of the process. While I received archival data from the AAPA, I did not involve members of the research department in data analysis. Instead, I consulted with my second committee member, who is my methodology expert, and with dissertation statistics tutors at Walden. Finally, details of the research funding were disclosed to the Walden IRB.

Summary

PA well-being was examined in this quantitative, nonexperimental study employing archival data collected at the national level by the AAPA using their master file of US PAs. A sample of at least 85 respondents, based on calculations by G*Power 3.1 software, was sought. Multiple linear regression with mediation and moderation was conducted to determine the influence of autonomy, leadership responsibility, and CP relationship on the association between experience level and PA professional fulfillment or burnout, controlling for gender and recent job change. Threats to validity were

addressed by benchmarking sample demographics with valid external sources,

operationalizing variables in a manner that is grounded in established literature,

conducting a robust statistical analysis, and maintaining transparency around design

limitations. Ethical procedures employed at the time of original data collection was

accounted for and maintained during secondary analysis, and potential conflicts of

interest were reported to the Walden IRB.

Chapter 4: Results

Introduction

The focus of this study was to test the JD-R model conceived by Demerouti et al. (2001) in the context of PA professional well-being, as measured by the PFI, a well-being instrument created by Trockel et al. (2018). The goal was to determine if PA experience level, autonomy, leadership responsibility, and CP relationship, each of which represents a job resource, predicted professional fulfillment or burnout. Bivariate linear regression, mediation, and moderated mediation analyses were conducted to examine these relationships. This chapter contains a review of research questions and affiliated hypotheses, data collection information, and results of each statistical analysis.

Archival data gathered by the AAPA were used to evaluate the following research questions and hypotheses:

Research Question 1 (RQ1): Does PA experience level predict professional well-being?

Null Hypothesis ($H_0$1): PA experience level does not significantly predict professional well-being, as measured by the PFI.

Alternative Hypothesis (H_a1): PA experience level significantly predicts professional well-being, as measured by the PFI.

Research Question 2 (RQ2): Does PA autonomy mediate the relationship between experience level and professional well-being?

Null Hypothesis ($H_0$2): PA autonomy, as measured by the single autonomy item,

does not significantly mediate the relationship between experience level and

professional well-being, as measured by the PFI.

Alternative Hypothesis (H_a2): PA autonomy, as measured by the single autonomy

item, significantly mediates the relationship between experience level and

professional well-being, as measured by the PFI.

Research Question 3 (RQ3): Does PA leadership responsibility mediate the

relationship between experience level and professional well-being?

Null Hypothesis ($H_0$3): Leadership responsibility, as measured by the composite

leadership score, does not significantly mediate the relationship between

experience level and professional well-being, as measured by the PFI.

Alternative Hypothesis (H_a3): Leadership responsibility, as measured by the

composite leadership score, significantly mediates the relationship between

experience level and professional well-being, as measured by the PFI.

Research Question (RQ4): Is the relationship between PA autonomy and

professional well-being moderated by the quality of the CP relationship?

Null Hypothesis 4 ($H_0$4): The quality of the CP relationship, as measured by the

single CP relationship item, does not significantly moderate the relationship

between PA autonomy as measured by the single autonomy item, and professional

well-being, as measured by the PFI.

Alternative Hypothesis (H_a4): The quality of the CP relationship, as measured by

the single CP relationship item, significantly moderates the relationship between

PA autonomy, as measured by the single autonomy item, and professional well-being, as measured by the PFI.

Research Question 5 (RQ5): Is the relationship between PA leadership responsibility and professional well-being moderated by the quality of the CP relationship?

Null Hypothesis ($H_0$5): The quality of the CP relationship, as measured by the single CP relationship item, does not significantly moderate the relationship between PA leadership responsibility, as measured by the composite leadership score, and professional well-being, as measured by the PFI.

Alternative Hypothesis (H_a5): The quality of the CP relationship, as measured by the single CP relationship item, significantly moderates the relationship between PA leadership responsibility, as measured by the aggregate leadership score, and professional well-being, as measured by the PFI.

Data Collection

Recruitment and Response Rates

Members of the AAPA research department gathered the data used in this study between February 2 and March 2, 2018 (AAPA, 2018). The AAPA survey focused on practice conditions of PAs within the profession in 2017. Links to the survey were sent to 78,244 members of the AAPA's master file and were also posted on social media. Of the items used in this study, responses varied from 7,150 to 9,906, resulting in a response rate range of 9.14 to 12.66%. In spite of a low response rate, the overall survey as

administered by the AAPA had a low margin of error, or +/- 1.05% at the 95%

confidence level (AAPA, 2018).

Discrepancies

One discrepancy in the study was related to the single item used to measure PA

autonomy. It was originally planned to use an item worded as: *What percentage of your*

patients do you discuss with your CP. However, once the data set was received, it was

discovered that the item was actually phrased to measure that percentage of clinical time

that respondents spent consulting with their CPs. In other words, instead of measuring

percentage of patients discussed with a CP, the item measured the percentage of time

spent consulting with a CP.

The intent of the single PA autonomy item was to quantify the amount of

autonomy exercised by respondents in making independent medical decisions, as

opposed to decisions about which they consulted with their CPs. Decreasing percentages

of both patients and time spent consulting with CPs both represent increasing levels of

autonomy. Therefore, in spite of the discrepant wording, the item used in the data set

should still serve as a viable measure of PA autonomy.

Another discrepancy involved the exclusion criteria. It was originally planned to

exclude respondents who had changed employers or specialties in the previous year from

analysis. However, rather than exclude those who responded in the affirmative to either

changing employers or specialties, these responses were instead entered into both the

mediation and moderated mediation as covariates, along with gender.

Results

Sample Descriptive Statistics

Sample percentages and frequencies related to gender, race, and ethnicity in comparison to population level data from the NCCPA are listed in Table 1. Male respondents made up 30.7% (n = 2,721) of the sample, in comparison to 31.2% (n = 40,900) of the population (NCCPA, 2019a). Female respondents made up 69.3% (n = 6,152) of the sample, in comparison to 68.8% of the population (n = 90,239). The gender composition of the sample was equivalent to that in the U.S. PA population.

Table 1

Descriptive Statistics of Sample Demographic Variables and Comparative Population

Demographic Category	Sample %	Sample n	NCCPA 2018 %	NCCPA 2018 n
Gender				
Male	30.7	2,721	31.2	40,900
Female	69.3	6,152	68.8	90,239
Total		8,873		131,139
Race				
White	85.7	7,624	86.9	94,827
Black/African American	2.5	222	3.6	3,951
American Indian/Alaska Native	0.4	35	0.4	411
Asian	4.9	435	5.8	6,295
Native Hawaiian/Other Pacific Islander	0.3	25	0.3	335
2 or more	2.2	194	---	---
Other	1.7	149	3	3,321
Prefer not to answer	2.4	213	---	---
Total		8,897		109,140
Ethnicity				
Hispanic or Latino	5.4	482	6.3	7,078
Not Hispanic or Latino	92.4	8,239	93.7	104,550
2 or more	NA	NA	.0	299
Prefer not to answer	2.2	192	.0	4,925
Total		8,913		116,852

Note. From "2018 Statistical Profile of Certified Physician Assistants" by the NCCPA, 2018. NCCPA does not report PAs identifying as 2 or more races or those preferring not to answer.

Racial demographics within the sample demonstrated some variability when compared to the population. Sample representation of American Indian/Alaska Native (0.4%, *n* = 35), and Native Hawaiian/Other Pacific Islander (0.3%, *n* = 25) respondents was equivalent to the current population of PAs from these racial groups (0.4%, *n* = 411 and 0.3%, *n* = 335, respectively; NCCPA, 2019a). The sample representativeness among respondents identifying as Black/African American (2.5%, *n* = 222) and Asian (4.9%, *n* = 435) was low compared to the population (3.5%, *n* = 3,951 and 5.8%, *n* = 6,295, respectively). Respondents identifying as White/Caucasian comprised 85.7% (*n* = 7,624) of the sample, which is less than the population (86.9%, *n* = 94,827).   Remaining respondents selected *two or more races* (2.2%; *n* = 194), *other* (1.7%; *n* = 149) or *prefer not to answer* (2.4%, *n* = 213). The NCCPA did not report PAs certified in 2018 who either identified as two or more races or preferred not to answer, which may be responsible for discrepancies seen in the sample.

Minor differences were seen between sample ethic categories as compared to the population. Respondents identifying as Hispanic or Latino made up 5.4% (*n* = 482) of the sample, in comparison to 6.3% of the population (*n* = 7,078). Respondents who did not identify as Hispanic or Latino made up 92.4% (*n* = 8,239) of the sample, in comparison to 93.7%% of the population (*n* = 104,550).

Sample percentages and frequencies related to practice setting and specialty are included in Table 2. Most respondents worked in either an outpatient clinic or physician office (53.2%; *n* = 4,796) or a hospital (35.1%; *n* = 3,166). Remaining respondents were either educators 1.6% (*n* = 145), or worked in an urgent care (5.5%; *n* = 494), at an

occupational medicine setting or work site (0.7%; *n* = 62), or at a school, college, or

university clinic (0.6%; *n* = 58). Of the remaining respondents, 3.3% (*n* = 302) listed

another type of setting. The NCCPA reports settings using different categories, making

comparison to this sample difficult.

Table 2

Descriptive Statistics of Sample Practice Variables and Comparative Population

Practice Variable	Sample %	Sample *n*	NCCPA 2018 %	NCCPA 2018 *n*
Setting[a]				
Outpatient clinic or physician office	53.2	4,796	---	---
Hospital	35.1	3,166	---	---
Urgent care	5.5	494	---	---
School/college/ university educator	1.6	145	---	---
Occupational medicine/work site	0.7	62	---	---
School/college/ university clinic	0.6	58	---	---
Other setting	3.3	302	---	---
Specialty				
Primary care	24.0	2,161	25.8	25,487
Internal medicine subspecialty	11.8	1,058	10.5	10,463
Pediatric subspecialty	1.1	102	1.1	1,334
Surgical subspecialty	25.4	2,301	23.3	23,015
Emergency medicine	9.0	813	13	12,860
All other specialties	26.5	2,391	25.9	25,404
No medical specialty[b]	2.2	201	---	---
Changed in the last year[b]				
Employer (yes)	12.4	984	---	---
Specialty (yes)	6.4	511	---	---

Note. From "2018 Statistical Profile of Certified Physician Assistants by Specialty" by the National
Commission on Certification of Physician Assistants, 2018.
[a]NCCPA reports different settings than those used by the AAPA, so NCCPA settings are not included.
[b]NCCPA does not report PAs identifying no medical specialty or the percentage of PAs who recently
changed employer or specialty, so neither of these categories were included.

The sample was validated across specialty categories using NCCPA data (see

Table 2). PAs work in every medical specialty and to simplify reporting, responses from

both the sample and the NCCPA were categorized into one of the AAPA's seven

specialty roll-ups: *primary care* (which included family medicine, general internal

medicine, and general pediatrics), *emergency medicine*, *internal medicine subspecialties*

(cardiology, critical care, endocrinology, gastroenterology, hematology and oncology, infectious disease, nephrology, neurology, pulmonology, and rheumatology), *pediatric subspecialties*, *surgical subspecialties* (general, bariatric, cardiovascular/cardiothoracic, colon and rectal, neurosurgery, surgical oncology, orthopedic, otolaryngology, pediatric, plastic, transplant, trauma, urology, and vascular surgery), *all other specialties* (including but not limited to dermatology, hospital medicine, obstetrics and gynecology, and psychiatry), and *no medical specialty*.

The three most prevalent specialty roll-ups within the sample were similar to those of PAs at the national level. Within the sample, 26.5% ($n = 2,391$) of respondents reported a specialty in the *all other specialties* category, as compared to 25.9% ($n = 25,404$) of PAs nationally (National Commission on Certification of Physician Assistants [NCCPA], 2019b). Twenty-four percent ($n = 2,161$) of sample respondents selected *primary care* as their specialty, in comparison to 25.8% ($n = 25,487$) of PAs nationally, while 25.4% ($n = 2,301$) reported working in a *surgical subspecialty*, as compared to 23.3% ($n = 23,105$) nationally. Those working in an *internal medicine subspecialty* comprised 11.8% ($n = 1,058$) of the sample, as compared to 10.5% ($n = 10,463$) of the population, and those working in *emergency medicine* comprised 9% ($n = 813$) of the sample and 13% ($n = 12,860$) of the population. PAs working in a *pediatric subspecialty* comprised 1.1% of both the sample ($n = 102$) and the population ($n = 1,334$). Finally, 2.2% ($n = 201$) of the sample reported *no medical specialty*, which is not reported by the NCCPA. Other than emergency medicine, the practice specialty of sample respondents

was similar to the population of PAs practicing in the US during the time of data collection.

Table 2 includes descriptive statistics about PAs who either changed employers or changed specialties in the year previous to data collection, which the NCCPA does not report. PAs who reported changing employers comprised 12.4% ($n = 984$) of the sample and PAs who changed specialties comprised 6.4% ($n = 511$) of in the same time frame. These were used as covariates in the mediation and moderated mediation analyses.

Descriptive statistics for the predictor variable are included in Table 3. Mean years of experience for sample respondents was 11.23 years (SD = 9.632, range = 0-48 years). The NCCPA does not report career length data, so sample validation along these lines is not possible.

Table 3

Descriptive Statistics of Predictor, Mediator, Moderator, and Outcome Variables

| | | | | Range | |
Variable Type	n	Mean	SD	Minimum	Maximum
Predictor					
Years of experience	8761	11.23	9.632	0	48
Potential Mediator					
% Consult CP (autonomy)	7150	17.93	21.203	0	100
Aggregate leadership score	9906	1.21	2.618	0	13
Potential Moderator					
CP Relationship	7253	4.56	.749	1	5
Outcome[a]					
PFI BO average	7662	1.04	.656	0	4
PFI PF average	7710	2.66	.874	0	4

Note. SD = standard deviation; CP = collaborative physician; PFI = Professional Fulfillment Index; BO = burnout; PF = professional fulfillment. [a] Criteria for high professional fulfillment was an average item score of 3.0 or greater and high burnout was an average item score of 1.33 (Trockel et al., 2018).

Table 3 also includes sample means, standard deviations, ranges, and frequencies of the potential mediator variables. Mean percentage of time spent consulting with a CP,

at times shortened to *percent consult CP* for ease of reporting, was 17.93% (SD = 21.20,

range = 0 to 100%), suggesting that on average, PAs in the sample spent most of their

clinical time not consulting with their CP. Mean aggregate leadership score, termed

leader score going forward, was 1.21 tasks (SD = 2.62, range = 0 to 13), indicating that

the average respondent had at least one leadership responsibility. Figure 2 demonstrates

the percentage and frequency of each leadership task reported by respondents.

Frequency (*n*) of Respondents with Individual Leadership Tasks
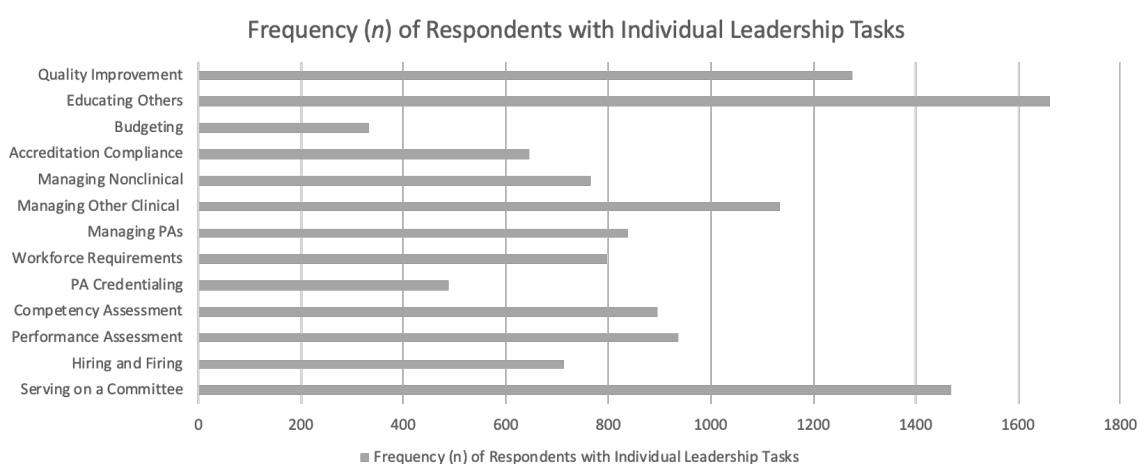
Figure 2. Respondent leadership responsibilities, with frequencies on the horizontal axis and leadership responsibilities on the vertical axis. The top five most reported included educating others (*n* = 1,663), serving on a committee (*n* = 1,468), conducting quality improvement (*n* = 1,277), managing other clinical staff (*n* = 1,134), and performance assessment (*n* = 936).

Mean relationship with CP, which was rated on a scale of one to five (*extremely*

negative, somewhat negative, neither positive nor negative, somewhat positive, and

extremely positive), is also reported in Table 3. Mean CP relationship was 4.56 (SD =

.75, range = 1 to 5), indicating that most PAs in the sample rated their relationship with a

CP as either somewhat positive or extremely positive (see Figure 3).
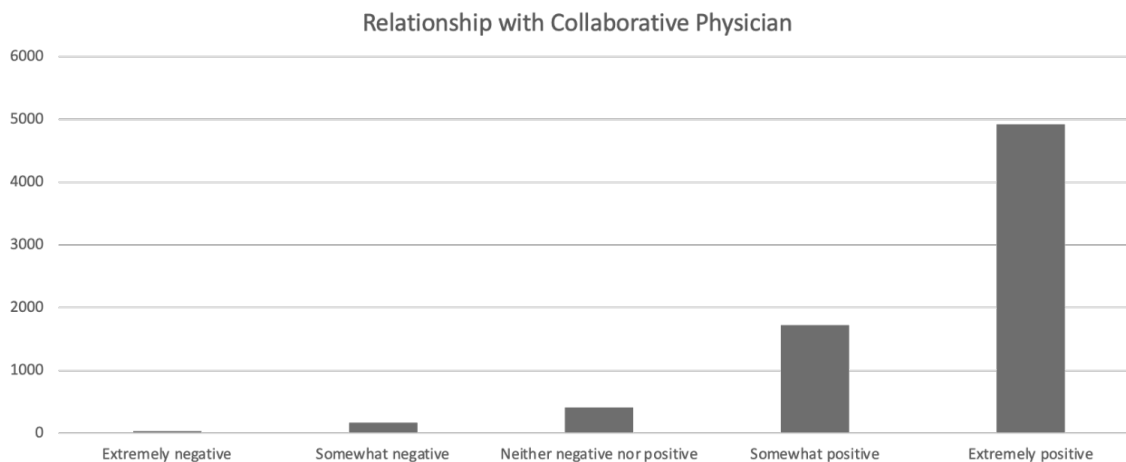
Figure 3. Sample distribution of responses to relationship with CP, with frequencies on the vertical access and response options on the horizontal access.

Table 3 also includes sample means, standard deviations, ranges, and frequencies related to both of the outcome variables. Results for both professional fulfillment and burnout were reported as scale averages, which is consistent with previously established parameters for the PFI. The mean professional fulfillment scale item average was 2.66 (SD = .87, range = 0 to 4). Criteria for high professional fulfillment was an average item score of 3.0 or greater (Trockel et al., 2018). As such, most respondents in the sample did not meet criteria for high professional fulfillment. The mean burnout scale item average, calculated using averages from the exhaustion and interpersonal disengagement subscales, was 1.04 (SD = .66, range 0 to 4). Criteria for high burnout was an average item score on the burnout scale of 1.33 (Trockel et al., 2018), and as such, most respondents in the sample did not meet criteria for high burnout.

Statistical Assumptions

Several assumptions were verified prior to conducting the statistical analysis. The control, predictor, potential mediator, and potential moderator variables were collected as

either continuous, ordinal, or dichotomous, and the outcome variables were ordinal,

meeting criteria for Pearson correlation and linear regression. Relationships between

pairs of variables were confirmed prior to conducting multivariate linear regression.

Scatter plots were visually examined to assess for homogeneity of variance of outcome

variables across levels of predictor variables (Warner, 2013). Normal distribution was

also assessed by visually inspecting scatter plots, except in the case of moderated

mediation, in which bootstrapping was utilized (Hayes, 2018). To eliminate the potential

for outliers, the survey data from which the archival dataset was derived was

programmed at the response level for responses to fit within two standard deviations of

the mean (N. Smith, personal communication, December 12, 2019).

Pearson Correlation Analysis

Pearson correlation coefficients (r) for dyad relationships between the covariates,

predictor, mediator, moderator, and outcome variables are displayed in Table 4. Using

standard criteria for effect size, a small effect is indicated by $r = .1$ to .3 or -.1 to -.3, a

medium effect size by $r = .3$ to .5 or -.3 to -.5, and a large effect size as $r = .5$ to 1.0 or -.5

to -1.0 (Cohen, 1988). Gender significantly correlated with years of experience,

percentage of clinical time spent consulting with CP, leader score, CP relationship,

professional fulfillment, and burnout. Changed employer in the last year significantly

correlated with years of experience, leader score, CP relationship, and professional

fulfillment. Changed specialty in the last year significantly correlated with years of

experience, percentage of clinical time spent consulting with CP, and leader score.

Because of their significant correlations with predictor, potential mediators and

moderator, and outcome variables, gender, changed employer in the last year, and changed specialty in the last year were used as covariates in the mediation and moderated mediation analyses.

The predictor variable years of experience significantly correlated with both potential mediators, the potential moderator, and both outcome variables. Years of experience negatively correlated with the percentage of clinical time spent consulting with CP ($r = -.156$, $p < .001$). Though the effect size was small, this indicates that as sample respondent experience levels increased, the percentage of their clinical time spent consulting with a CP decreased and their autonomy accordingly increased. Years of experience positively correlated with leader score ($r = .232$, $p < .001$), also to a small effect. This association suggests that as sample respondent experience levels increased, so too did their leadership responsibilities. Years of experience also positively correlated with CP relationship ($r = .039$, $p = .001$), though the effect was negligible.

Regarding correlations with professional well-being, years of experience negatively correlated with average burnout score ($r = -.104$, $p < .001$) and positively correlated with average professional fulfillment score ($r = .071$, $p < .001$). The effect with burnout was small but may still suggest that PA career maturation is associated with lower burnout. The effect size with professional fulfillment was negligible.

Table 4

Pearson Correlation of Control, Predictor, Mediator, Moderator, and Outcome Variables

Variable	Results	Gender	Changed Employer	Changed Specialty	Years	% Consult CP	Leader Score	CP Relationship	PFI BO Average	PFI PF Average
Gender (1 = female)	Pearson correlation	1								
	p-value									
	n	8873								
Changed Employer	Pearson correlation	.027	1							
	p-value	.017								
	n	7923	7961							
Changed Specialty	Pearson correlation	.033	.517	1						
	p-value	.003	.000							
	n	7923	7961	7961						
Years	Pearson correlation	-.155	-.052	-.071	1					
	p-value	.000	.000	.000						
	n	8714	7961	7961	8761					
% Consult CP	Pearson correlation	.072	-.013	.049	-.156	1				
	p-value	.000	.258	.000	.000					
	n	7120	7150	7150	7150	7150				
Leader Score	Pearson correlation	-.108	-.081	-.060	.232	-.035	1			
	p-value	.000	.000	.000	.000	.003				
	n	8873	7961	7961	8761	7150	9906			
CP Relationship	Pearson correlation	-.069	-.063	-.021	.039	.053	.090	1		
	p-value	.000	.000	.074	.001	.000	.000			
	n	7221	7253	7253	7253	7049	7253	7253		
PFI BO Average	Pearson correlation	.052	-.011	-.014	-.104	-.008	-.062	-.279	1	
	p-value	.000	0.335	.233	.000	.515	.000	.000		
	n	7628	7662	7662	7662	7054	7662	7144	7662	
PFI PF Average	Pearson correlation	-.083	-.026	-.015	.071	-.010	.143	.356	-.584	1
	p-value	.000	.023	.196	.000	.380	.000	.000	.000	
	n	7676	7710	7710	7710	7065	7710	7164	7652	7710

Correlations between relationship with CP and PA well-being demonstrated the largest effect sizes. CP relationship correlated with both average burnout (r = -.279, p < .001) and average professional fulfillment (r = .356, p < .001) scores to a small and medium effect, respectively. These associations suggest that as the quality of the CP relationship increases, PA burnout decreases and professional fulfillment increases. This underscores the importance of the CP relationship for PA well-being and validates its use as a potential moderator. CP relationship also positively correlated with both percentage of clinical time spent consulting with CP (r = .053, p < .001) and leader score (r = .090, p < .001), though both effect sizes were negligible.

Bivariate Linear Regression

Bivariate linear regression was conducted to evaluate the direct effects of the predictor variable, and each potential mediator and moderator variable, on the outcome variables, controlling for covariates (Table 5). Covariates in each regression include gender, and respondents who had recently changed either their employer or specialty.

Table 5

Direct Effects of Independent Variables on PA Professional Fulfillment and Burnout

Type of independent variable	Direct Effect Path	Standardized coefficients β	Std error	t	p-value
Predictor	Years → PF	**.059**	.001	5.121	.000
	Years → BO	**-.100**	.001	-8.610	.000
Potential mediator	% Consult CP → PF	-.005	.000	-.433	.665
	% Consult CP → BO	-.011	.000	-.948	.343
	Leader Score → PF	**.135**	.004	11.889	.000
	Leader Score → BO	**-.059**	.003	-5.107	.000
Potential moderator	CP relationship → PF	**.351**	.013	31.648	.000
	CP relationship → BO	**-.276**	.010	-24.113	.000

Note. All paths controlled for gender, and changed employer or specialty in the last year. Paths with statistically significant direct effects bolded for emphasis. PF = professional fulfillment. BO = burnout. CP = collaborative physician.

Years of experience demonstrated statistically significant direct effects on both professional fulfillment (β = .059, SE = .001, p < .001) and burnout (β = -.100, SE = .001, p < .001). For every one-year increase in experience, average PA professional fulfillment scores increased by .059 units and average PA burnout scores decreased by .100 units. Though effects were small, with years of experience explaining approximately 1% of the variability in both professional fulfillment (r = .104, r^2 = .011 p < .001) and burnout (r = .112, r^2 = .013 p < .001) averages reported in the sample, results demonstrate support for the alternate hypothesis and rejection of the null hypothesis for research question 1.

Potential mediators demonstrated different associations with PA professional well-being. The direct effects of the percentage of clinical time that PAs spent consulting with a CP on professional fulfillment (β = -.005, SE = .000, p = .665) and burnout (β = -.011, SE = .000, p = .343) were not significant, negating the role of percentage of time spent consulting with a CP as a mediator. However, the direct effects of leader scores on both professional fulfillment (β = .135, SE = .004, p < .001) and burnout (β = -.059, SE = .003, p < .001) were significant. As the leader score increased by one-unit, average professional fulfillment score increased by .135 units and average burnout score deceased by .059 units. The effects on professional fulfillment (r = .160, r^2 = .025 p < .001) were small, with leader score predicting 3% of the variability seen in professional fulfillment. The effects on burnout (r = .112, r^2 = .013 p < .001) were also small, with leader score predicting 1% of the variability seen in burnout.

The quality of the relationship with a CP demonstrated the strongest direct effects on both professional well-being and burnout of all independent variables. As the score

on the quality of the CP relationship increased by one-unit, the average professional

fulfillment score increased by .351 units and the average burnout score decreased by .276

units. CP relationship accounted for 13% of the variability seen in professional

fulfillment ($r = .359$, $r^2 = .129$ $p < .001$) for a medium effect and 8% of the variability

seen in burnout ($r = .280$, $r^2 = .078$ $p < .001$) for a small effect.

Mediation Analysis

Mediation analysis as outlined by Baron and Kenny (1986) was used to evaluate

relationships between years of experience and professional well-being, with aspects of

career development serving as mediators (see Figure 4). According to Baron and Kenny,

path *c* of the analysis represents the direct effect of the predictor variable (years of

experience) on the outcome variables (professional fulfillment and burnout). Path *a*

represents the regression of each mediator variable, or the percentage of clinical time

spent consulting with a CP and leader score, on the predictor variable. Path *b* represents

the impact of the mediator variables on the outcome variables, controlling for the

predictor variable (Baron & Kenny, 1986). Finally, path *c'* represents the indirect effect

of years of experience on professional well-being through each potential mediator.
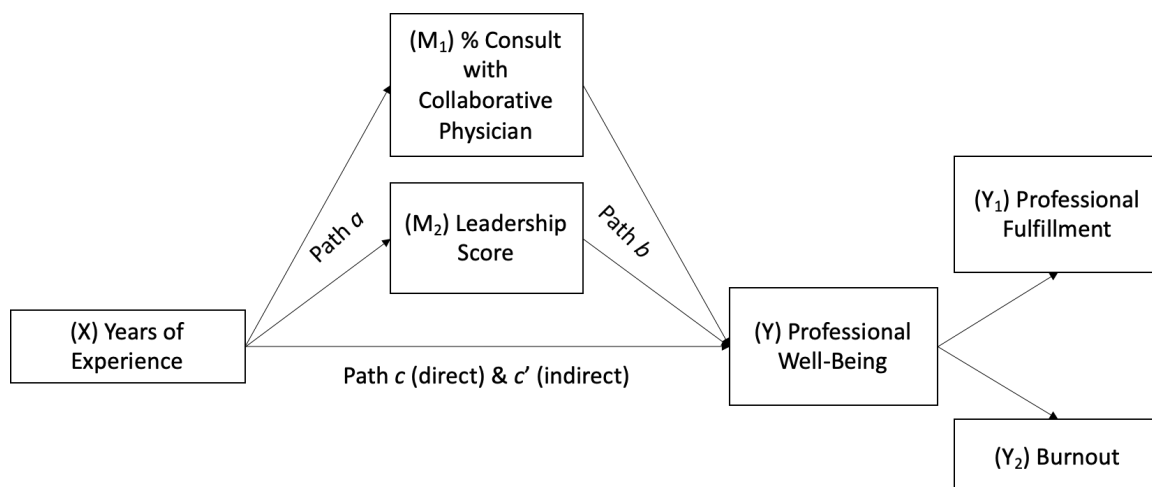
Figure 4. A statistical diagram of the simple mediation model.

Several steps must be taken to determine if a variable mediates the relationship between a predictor variable and an outcome variable. First, path *c* must be statistically significant, indicating an association between years of experience and professional well-being (Hayes, 2018). Results in Table 5 demonstrate that years of experience predicted both professional fulfillment and burnout, confirming that path *c* is statistically significant.

The second criterion for mediation involves confirmation that there is a statistically significant relationship between the predictor and mediator variable, suggesting that the mediator variable exists between the predictor and outcome variable in time (Hayes, 2018). In the current study, the relationship between years of experience and both mediators (path *a*), the percentage of time spent consulting with a CP (β = -.147, *SE* = .026, *p* < .001) and leader score (β = .209, *SE* = .003, *p* < .001), were statistically significant, meeting mediation criteria. Years of experience was negatively associated with the percentage of time that a PA spends consulting with a CP, suggesting that as

PAs gain more clinical experience, they consult less with a CP. Years of experience explained 3% of the variability seen with the percentage of consultation time with a CP (r = .175, r^2 = .031 $p < .001$). Years of experience was positively associated with leader score, suggesting that as PAs practice for longer, their leadership responsibilities increase. Years of experience explained 6% of the variability seen with leader score (r = .247, r^2 = .061, $p < .001$).

Table 6

Mediation Path Coefficients

RQ	Path		Standardized coefficients β	SE	t	p-value
1	c	Years → PF	.059	.001	5.121	.000
	c	Years → BO	-.100	.001	-8.610	.000
2	a	Years → % Consult CP	-.147	.026	-12.430	.000
	b	% Consult CP → PF	.003	.000	.259	.796
	c'	Years → % Consult CP → PF	.058	.001	4.766	.000
	c	Years → PF	.059			.000
	a	Years → % Consult CP	-.147	.026	-12.430	.000
	b	% Consult CP → BO	-.026	.000	-2.139	.032
	c'	Years → % Consult CP → BO	-.101	.001	-8.277	.000
	c	Years → BO	-.100			.000
3	a	Years → Leader Score	**.209**	.003	18.873	.000
	b	Leader Score → PF	**.129**	.004	11.067	.000
	c'	Years → Leader Score → PF	**.032**	.001	2.764	.006
	c	Years → PF	**.059**			.000
	a	Years → Leader Score	.209	.003	18.873	.000
	b	Leader Score → BO	**-.040**	.003	-3.453	.001
	c'	Years → Leader Score → BO	**-.091**	.001	-7.738	.000
	c	Years → BO	**-.100**			.000

Note. All paths controlled for gender, and changed employer or specialty in the last year. Paths positive for mediation bolded for emphasis. RQ = research question. SE = standard error. PF = professional fulfillment. BO = burnout. CP = collaborative physician.

The third criterion to determine mediation is when the potential mediator demonstrates a statistically significant association with the outcome variable (path *b*), controlling for the predictor variable. For research question 2, this involves a relationship between the percentage of time spent consulting with a CP and professional fulfillment or

burnout. A statistically significant relationship was found between the percentage of time spent consulting with a CP and burnout ($\beta = -.026$, *SE* $= .000$, *p* $= .032$), but not professional fulfillment ($\beta = .003$, *SE* $= .000$, *p* $= .796$). Therefore, the percentage of time spent consulting with a CP does not mediate the relationship between years of experience and professional fulfillment, although its mediation of burnout is yet to be determined.

The final criterion for mediation involves analyzing the indirect effect of a predictor variable on an outcome variable while controlling for paths *a* and *b* (path c') to determine if a previously statistically significant direct effect either loses significance or decreases in slope (Baron & Kenny, 1986). The indirect effect of years of experience on burnout, controlling for the percentage of time spent consulting with a CP, not only maintained statistical significance ($\beta = -.101$, *SE* $= .001$, *p* $< .000$) but the slope slightly steepened when compared to its direct effect ($\beta = -.100$, *SE* $= .001$, *p* $< .000$). Therefore, percentage of time spent consulting with CP did not mediate the relationship between years of experience and burnout or professional fulfillment, and the null hypothesis for research question 2 cannot be rejected.

For research question 3, path *b* involves the relationship between leader score and professional fulfillment or burnout. A statistically significant relationship was found between leader score and professional fulfillment ($\beta = .129$, *SE* $= .004$, *p* $< .001$), with leader score predicting 3% of the variability seen with professional fulfillment ($r = .163$, $r^2 = .026$, *p* $< .001$). A statistically significant relationship was also found between leader score and professional fulfillment ($\beta = -.040$, *SE* $= .003$, *p* $= .001$), with leader score predicting 1% of the variability seen with burnout ($r = .119$, $r^2 = .014$, *p* $< .001$). Leader

score had a significant effect on professional fulfillment and burnout, which meets the third criterion for mediation (Baron & Kenny, 1986).

The final criterion for mediation in research question 3 involves analyzing the indirect effect of years of experience on professional fulfillment and burnout, controlling for the leader score. For professional fulfillment, path c' ($\beta = .032$, $SE = .001$, $p < .01$) maintained statistical significance but the slope decreased when compared to path c ($\beta = .059$, $SE = .001$, $p < .001$). This suggests that leadership responsibility partially mediates the relationship between years of experience and professional fulfillment. Additionally, the indirect effect of years of experience on burnout, controlling for leader score, maintained statistical significance ($\beta = -.091$, $SE = .001$, $p < .000$) but the slope decreased when compared to its direct effect ($\beta = -.100$, $SE = .001$, $p < .000$). Therefore, leadership responsibility also partially mediates the relationship between years of experience and burnout, lending support to the alternate hypothesis and rejecting the null hypothesis of research question 3.

Moderated Mediation Analysis

Conditional process analysis (CPA; Hayes, 2018) was conducted to examine, to a deeper complexity than mediation analysis, under which conditions career length may exert its effects on PA professional well-being. CPA makes it possible to calculate the indirect effect of a predictor variable on an outcome variable through a mediator at different values of a moderator (Hayes, 2018). Specifically, a moderated mediation analysis was calculated in order to identify the indirect effects of years of experience on professional fulfillment and burnout through either percentage of time spent on CP

consultation or aggregate leadership responsibility, as a function of the relationship with a CP.

Additionally, CPA makes it possible to consider whether a variable that may not have served as a mediator in the absence of moderation, such as percentage of clinical time spent consulting with a CP, may serve as a mediator as a function of a moderator (Hayes, 2018). This is possible within the context of CPA because the standardized coefficient of the mediator is the sum of the standardized coefficient of the mediator alone (path *b*) and the standardized coefficient of the interaction of the mediator and the moderator (Hayes, 2018).

To examine research questions 4 and 5, a moderated mediation analysis of the *b* pathway was conducted using model 14 of the Hayes (2018) PROCESS v3.4 macro for SPSS. Figure 5 displays the statistical diagram for the moderated mediation. Confidence intervals were set to 95% and bootstrapping to 5000 samples was done for the indirect effects of the moderated mediation. Continuous variables were centered to the mean and a robust standard error was set to Cribari-Neto. Cribari-Neto robust standard error was used to overcome heteroscedasticity that may occur when analyzing cross sectional data using linear regression (Cribari-Neto & Lima, 2014).
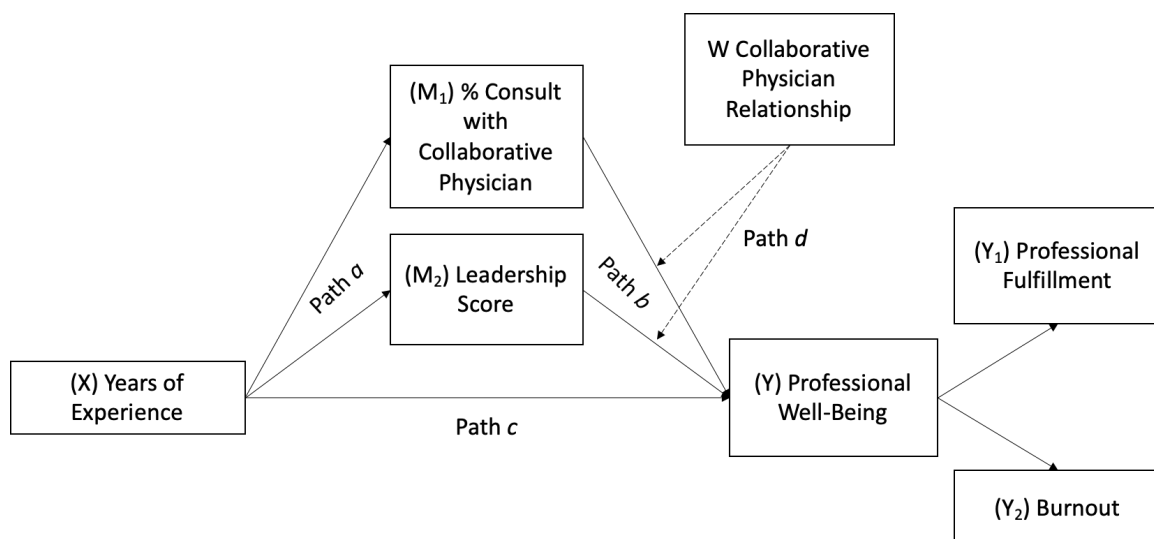
Figure 5. The statistical diagram for the moderated mediation model.

Moderated mediation path coefficients of paths *a, b, c, d,* and *b* x *d* are listed in Table 7. Paths *a, b,* and *c* represent similar relationships as were present in the mediation analysis. Path *d* represents the direct effect of CP relationship, the potential moderator, on the outcome variables, controlling for years of experience and both potential mediators. Path *b* x *d* represents the regression of both outcome variables on the interaction of CP relationship and the associated potential mediator.

Table 7

Moderated Mediation Path Coefficients

RQ	Path		Coefficient	Robust SE	t	p-value
4	*a*	Years → % Consult CP[a]	**-.326**	.025	-12.913	.000
	b	% Consult CP → PF	-.001	.000	-1.706	.088
	c	Years → PF[a]	**.004**	.001	3.582	.000
	d	CP Relationship → PF[a]	**.413**	.015	27.343	.000
	b x d	% Consult CP x CP Relationship → PF	**.003**	.001	3.746	.000
	a	Years → % Consult CP[a]	**-.327**	.025	-12.903	.000
	b	% Consult CP → BO	.000	.000	-.708	.479
	c	Years → BO[a]	**-.006**	.001	-7.563	.000
	d	CP Relationship → BO[a]	**-.241**	.011	-21.086	.000
	b x d	% Consult CP x CP Relationship → BO	**-.001**	.001	-2.405	.016
5	*a*	Years → Leader Score	**.044**	.004	12.631	.000
	b	Leader Score → PF	**.036**	.004	8.938	.000
	c	Years → PF[a]	**.002**	.001	2.230	.026
	d	CP relationship → PF[a]	**.395**	.014	27.653	.000
	b x d	Leader Score x CP relationship → PF	-.011	.007	-1.658	.097
	a	Years → Leader Score	**.044**	.004	12.692	.000
	b	Leader Score → BO	**-.006**	.003	-2.040	.041
	c	Years → BO[a]	**-.006**	.001	-7.046	.000
	d	CP relationship → BO[a]	**-.238**	.011	-21.598	.000
	b x d	Leader Score x CP relationship → BO	-.000	.005	-.024	.981

Note. All paths controlled for gender, and changed employer or specialty in the last year. RQ = research question. CP = collaborative physician. PF = professional fulfillment. BO = burnout.
[a]Similarly-labelled paths within research questions (i.e. Years → % Consult CP in RQ 4) and between research questions (i.e. CP relationship → PF in RQ 4 and 5) produced different coefficients secondary to a different number of responses to items within each moderated mediation path analysis.

Bootstrapped indices of each moderated mediation are listed in Table 8.

Bootstrapping does not generate a *p*-value. Instead, if the associated confidence interval

does not include zero, the index is considered significant for a moderated mediation.

Results were rounded to four decimal points to verify inclusion of zero in confidence

intervals.

Table 8

Bootstrapped Index of Moderated Mediation

Moderated Mediation	Index	Robust SE	Bootstrapped Lower CI	Upper CI
Years → % Consult CP x CP Relationship → PF	**-.0011**	.0003	**-.0017**	**-.0006**
Years → % Consult CP x CP Relationship → BO	**.0005**	.0002	**.0001**	**.0009**
Years → Leader Score x CP relationship → PF	-.0005	.0003	-.0011	.0001
Years → Leader Score x CP relationship → BO	.0000	.0002	-.0004	.0004

Note. All paths controlled for gender, and changed employer or specialty in the last year. Paths with confirmed moderated mediation are bolded for emphasis. SE = standard error; CI = confidence interval.

As per findings related to research question 2, the percentage of clinical time spent consulting with CP did not mediate the relationship between years of experience and either professional fulfillment or burnout. However, there was a minor moderated mediation of the relationship between years of experience and professional fulfillment by the interaction of the percentage of time spent consulting with CP and CP relationship (index -.011, CI = -.0017 to -.0006). For every one unit increase in the product of percentage of consulting time with CP and CP relationship, controlling for years of experience, professional fulfillment increased by .003 units ($\beta = .003$, $SE = .001$, $p < .000$). The interaction of percentage of time spent consulting with CP and CP relationship also predicted burnout. There is a minor moderated mediation of the relationship between years of experience and burnout by the interaction of percentage of time spent consulting with CP and CP relationship (index .0005, CI = .0001 to .0009). For every one unit increase in the product of percentage of consulting time with CP and CP relationship, controlling for years of experience, burnout decreased by .001 units ($\beta = -.001$, $SE = .001$, $p = .016$). As such, the alternate hypothesis of research question 4 was accepted and the null hypothesis was rejected.

The interaction term of PA leader score and CP relationship does not significantly predict professional fulfillment (index -.0005, CI = -.0011 to .0001) or burnout (index .0000, CI = -.0004 to .0004). There is no moderated mediation of the relationship between years of experience and professional fulfillment (β = -.011, SE = .007, p = . 097) or burnout (β = -.000, SE = -.024, p = .981) by the interaction of PA leader score and CP relationship. Therefore, the null hypothesis for research question 5 cannot be rejected.

Summary

The representativeness of the sample's gender composition was equivalent to the US population of PAs, with only minor differences in its racial, ethnic, and specialty composition. Statistical analysis revealed support for three alternate hypotheses. Bivariate linear regression of PA professional well-being on years of experience was statistically significant for both professional fulfillment and burnout. Also, leader score mediated the relationship between years of experience and PA professional fulfillment and burnout. Finally, the interaction of CP relationship with the percentage of time spent consulting with a CP created a significant moderated mediation of PA professional fulfillment and burnout in the anticipated directions. These findings demonstrated support for the alternate hypotheses of research questions 1, 3 and 4.

Two alternate hypotheses were not supported. The percentage of time spent consulting with a CP did not function as a mediator of the relationship between years of experience and PA professional well-being. Additionally, the interaction of CP relationship and leader score did not produce a significant moderated mediation of the

relationship between years of experience and PA professional well-being. As such, the

null hypotheses of research questions 2 and 5 were not rejected.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The focus of this study was to test the JD-R model conceived by Demerouti et al., (2001) in the context of PA professional well-being, as measured by the PFI, a well-being instrument created by Trockel et al. (2018). The goal was to determine if PA experience level, autonomy, leadership responsibility, and CP relationship predicted professional fulfillment or burnout. The study sample comprised a subset of archival data gathered by the AAPA in 2018, and responses ranged from 7,150 to 9,906. The representativeness of the sample's gender composition was equivalent to the US. population of PAs, with only minor differences in its racial, ethnic, and specialty composition (NCCPA, 2019a; NCCPA, 2019b). Bivariate linear regression, mediation, and moderated mediation analyses were conducted to examine these relationships.

Statistical analysis revealed support for three of the five alternate hypotheses asserted in the study. Bivariate linear regression revealed that years of experience predicted statistically significant higher levels of professional fulfillment and lower levels of burnout. Mediation analysis confirmed that only the aggregate leadership score, and not the percentage of time spent consulting with a CP, served as a mediator of the relationship between years of experience and PA professional fulfillment and burnout. Finally, the interaction of CP relationship with the percentage of time spent consulting with a CP, and not with aggregate leadership score, created a significant moderated mediation of PA professional fulfillment and burnout in the anticipated directions.

Interpretation of Findings

Several statistically significant findings emerged related to direct and indirect relationships between variables. Outcomes suggest that vital relationships exist between PA career length, aspects of career development and social support in the form of CP relationship, and PA professional well-being.

Correlation between PA Gender and Leadership

Female gender demonstrated a small negative correlation with aggregate leadership score. These findings are in line with observations made by Curtis et al. (2017) that the ratio of female to male leaders within the PA profession was disproportionately low when compared to the ratio of women to the men in the PA workforce. For example, 28% of the past presidents of the American Academy of PAs have been female, while 69% of currently practicing PAs are female (NCCPA, 2019a). Because aggregate leadership score mediated the relationship between experience level and professional well-being, PAs with decreased access to leadership opportunities may experience lower professional well-being.

A female-predominate workforce may have implications for the PA profession at the population level. The healthcare workplace is intrinsically characterized by a multitude of job demands that are not readily modifiable, like workload, patient suffering, and administrative burden (NAM, 2019). In order to combat job demands, PA employers can enhance job resources (Demerouti et al., 2001). However, if female PAs experience these job resources to a lesser degree, a viable well-being intervention may become

immaterial among the majority of practicing PAs. Further research should be done to explore why female gender may predict negative well-being outcomes among PAs.

Correlation between PA Gender and CP Relationship

Female gender also correlated with a more negatively perceived relationship with CPs. This is problematic because the quality of the relationship with a CP interacted with the percentage of clinical time that PAs spent collaborating with their CPs to mediate the effects of career length on professional well-being. As their careers mature, female PAs may experience lower well-being owing to a trend toward more negatively perceived CP relationships. In summary, being a female PA may predict less opportunity for professional development or lower quality relationships with CPs, both of which may negatively influence professional well-being.

Relationship between Experience Level and PA Well-being

Experience level directly predicted both professional fulfillment and burnout. The longer a respondent had practiced as a PA, the more likely they were to meet professional fulfillment criteria and the less likely to meet burnout criteria. This was similar to findings in the review of literature related to NP well-being by Choi and Gagne (2016). Choi and Gagne found that career length positively correlated with NP job satisfaction.

For PAs, population-level conclusions about the influence of experience level on well-being have previously been lacking (Hoff et al., 2017). Osborn et al. (2019) evaluated PA well-being at the state level using the Maslach Burnout Inventory (MBI) and found a significant positive correlation between years of practice as a PA and levels

of depersonalization. It is difficult to compare these findings to the present study because researchers used different measurement tools, and state-level data may not generalize to the current sample. Also, both correlative and predictive statistics were used in the current study. No other studies have found that career length predicts PA professional fulfillment or burnout, and as such, the present study makes a significant contribution to PA well-being research.

Relationship between Autonomy and PA Well-being

Autonomy, as measured by the single-item *percentage of time spent consulting with a CP*, did not directly predict professional fulfillment or burnout. This is surprising because autonomy has demonstrated statistically significant associations with aspects of PA well-being in previous studies (Ashooh et al., 2019; Bell et al., 2002; Benson et al., 2016; Depalma et al., 2019; Filipova, 2014; Nelson & Hooker, 2016). Though *percentage of time spent consulting with a CP* has been used in a previous PA workforce study (Cawley & Bush, 2015), it was operationalized as an indicator of supervision, not as a measure of PA autonomy. Filipova (2014) found significant correlations between rural PA well-being and *percentage of patient load not discussed with a physician*, an item similar to the autonomy measure in the present study. However, Filipova measured more than just patient load discussed with CP as a measure of autonomy in her study. Her *satisfaction with autonomy and authority* (SAA) subscale addressed respondent satisfaction with the degree of responsibility and autonomy they had at work, and their spectrum of permitted clinical activities, prescriptive authority, and participation in clinical decision-making. The single-item measure used in this study may have been an

inadequate representation of how autonomy manifests within the PA profession. A more robust measure could be used to explore this relationship more fully.

In addition to Filipova (2014), other PA well-being researchers have approached autonomy differently than the present study and found significant associations with job satisfaction. Rather than measuring autonomy as the percentage of clinical time spent consulting with a CP, Benson et al. (2016) operationalized autonomy as *control over workload*. Bell et al. (2002) measured self-report levels of PA autonomy on a 5-point scale ranging from low to high. Ashooh et al. (2019) used a resilience tool to examine how PA control may influence burnout. DePalma et al. (2019) conducted a PA well-being study using a tool validated among nurse practitioners, which categorized autonomy alongside the concept of challenge at work. Perhaps if the current study had employed a scale that encompassed more factors of PA autonomy, significant relationships would have emerged.

Despite insufficient construct validity of the autonomy subscale, the lack of support for autonomy as a mediator has been seen in one other healthcare provider study. Anagnostopoulos et al. (2015) examined burnout as a mediator of the relationship between autonomy and the mental health of Greek medical residents. Researchers found no direct effect of autonomy on burnout, which precludes its ability to serve as a mediator (Baron & Kenny, 1986), and concluded that physician trainees may not desire autonomy and may not experience negative well-being in its absence. It is conceivable that because PAs practice in a delegated supervisory model (Hooker et al., 2015), they may also not desire autonomy. However, since multiple other PA studies (Ashooh et al., 2019; Bell et

al., 2002; Benson et al., 2016; Depalma et al., 2019; Filipova, 2014; Nelson & Hooker,

2016), as well as studies of physicians (Domagała et al., 2018) and other non-physician

providers (Choi & De Gagne, 2016; Faraz, 2017; Poghosyan et al., 2017), have found

significant associations between autonomy and well-being, it is unlikely that PAs do not

desire autonomy commensurate with their experience level and skill set.

Autonomy may serve as a moderator, rather than a mediator, of PA well-being.

In addition to delegated practice, the PA occupational model is also characterized by

"negotiated performance autonomy" (Cawley & Bush, 2015, p. 61), which suggests that

autonomy may expand in conjunction with PA competency level. In the present study, as

PA years of experience increased, the percentage of clinical time spent consulting with a

CP decreased. Lelli et al. (2015) found that increasing the experience level of NPs

working in retail clinics correlated with increasing levels of autonomy. In the study by

Anagnostopoulos et al. (2015), increasing experience levels of Greek medical residents

also predicted increasing levels of autonomy. It is conceivable that the incremental

increase in PA, NP, and medical resident autonomy alongside experience level seen in all

three studies may have attenuated the development of burnout and enhanced professional

fulfillment, behavior more consistent with a moderating variable. Considering autonomy

as a mediator of well-being may have been the wrong analytical approach.

Relationship between Leadership Responsibility and PA Well-being

Aggregate leadership score directly predicted professional well-being and

partially mediated the relationship between years of experience and PA well-being. Both

of these findings affirm the importance of leadership development among PAs and may

be explained by theories of career development. Atewologun, Kutzer, Doldor, Anderson, and Sealy (2017) reviewed literature related to individual identification at work and found that an employee's identification as a follower diminishes over time. For PAs, this may manifest as the expectation of an expanded scope of practice as their career matures. For example, new PAs may expect to have tasks delegated to them by CPs until they demonstrate the clinical reasoning and procedural skill to initiate these tasks appropriately on their own. Progression beyond here may involve PAs expecting to delegate tasks to others in a leadership capacity.

There is presently a dearth of studies examining the leadership aspirations of PAs. In one study on the professional development of PAs, the majority of respondents agreed that they possessed the competencies to lead (Wilson et al., 2019). In the same study, the majority of respondents reported no formal leadership responsibilities, inferring that even those not leading believed they would do it well if given the opportunity. Considering this alongside findings from the present study, PAs may expect opportunities for leadership as their careers mature. If these opportunities manifest, professional fulfillment may result. If opportunities to lead are not offered, burnout or another manifestation of job dissatisfaction may ensue.

Leadership opportunities may enhance well-being through indirect means, as well. Among a sample of EM PAs, Bell et al. (2002) found that increased administrative responsibility correlated with decreased emotional exhaustion and depersonalization. Bell et al. concluded that time spent on work activities outside of the emergency department offered a respite from the rigors of a stressful clinical setting, and thereby

may have attenuated burnout. In a review of physician leader well-being, Montgomery (2016) conjectured that those in formal leadership positions might have an enhanced sense of autonomy, which may contribute to enhanced well-being. Though the current study did not find an association between autonomy and well-being, Domagała et al. (2018) found higher levels of job satisfaction among physician respondents who had formal leadership roles. Future researchers should evaluate whether autonomy and leadership responsibility interact to predict PA well-being.

Influence of CP Relationship on PA Well-being

The quality of the CP relationship was the strongest direct predictor when compared to all variables included in the study, of PA professional fulfillment and burnout. These findings align with those of several other PA well-being studies. Tetzlaff et al. (2018) found that oncology PA respondents who rated the quality of their CPs' leadership skills as low or neutral were 7.85 times more likely to meet MBI burnout criteria. Among a sample of EM PAs, Bell et al. (2002) found that satisfaction with CP correlated with lower levels of burnout and a lower likelihood of self-reporting burnout. Considering the central role that CPs play in the professional development of PAs (Polansky, 2011) and the pervasive state licensing requirement for PAs to practice medicine within a physician-PA team (AAPA, 2019a), the association of CP relationship with PA well-being is not surprising. The present study contributes to the current body of PA well-being literature by affirming the importance of the CP relationship to the well-being of PAs within a larger sample of more heterogenous PA respondents than have been evaluated in past studies.

CP relationship also influenced how autonomy predicted PA well-being. When considered alone, the percentage of time spent consulting with a CP did not directly influence well-being, nor did it mediate the relationship between career length and well-being. However, when evaluated in the context of an interaction with CP relationship, the percentage of CP consulting time became a mediator of well-being as a function of career length.

The collaborative nature of the PA-physician working relationship may explain the notable effects of CP relationship on PA professional fulfillment and burnout seen in this study. PAs in one population-level study rated difficult employers as a more significant stressor than physicians who rated the same factor on another study (Coplan et al., 2018), suggesting that the collaborative nature of PA practice may make interpersonal relations more impactful to well-being than it does for physicians. A positive working relationship may be more salient for PAs who spend more clinical time in consultation with their CPs. Similarly, the strain of interacting with a CP in the context of a negative relationship may enhance the likelihood of burnout even for PAs who spend less time in consultation.

The interaction of aggregate leadership score and the quality of the CP relationship did not influence PA well-being as a function of career length. PAs are trained to practice medicine in conjunction with CP supervision, and PA licensure requirements in most states include CP supervision mandates (American Academy of PAs, 2019a). PAs whose daily responsibilities primarily include clinical, and not leadership, tasks may depend more heavily on CP consultation. It is possible that PAs

with more leadership than clinical responsibility may not rely on CP consultation in order to accomplish their daily tasks. Further, PA leadership tasks, such as hiring, firing, and determining workforce requirements, may not fall under state regulatory oversight and therefore, may not require CP supervision. As such, the quality of a CP relationship may be irrelevant to PAs whose job tasks primarily involve leadership.

Job Resources Relevant to PA Well-being

The JD-R model addresses the relationship between job demand, job resources, and states of professional well-being. According to the JD-R model, job resources will attenuate burnout and enhance professional fulfillment (Demerouti et al., 2001). Although it has been extensively referenced in studies of healthcare staff (Anagnostopoulos et al., 2015; Karaeminogullari et al., 2018; Livne & Goussinsky, 2018; Viotti et al., 2015), this is the first study to evaluate PA well-being using the JD-R model as a theoretical foundation.

Each variable examined in this study demonstrated properties of internal, external, or social job resources outlined by Demerouti et al. (2001). Increasing years of experience predicted increased professional fulfillment and decreased burnout, behavior consistent with an internal job resource. Expanded leadership responsibility, both directly and as a mediator of career length, predicted increased professional fulfillment and decreased burnout. Because employers bestow employees with opportunities to participate in leadership, leadership responsibilities may be considered an external job resource. The quality of the relationship with a CP, which represents a social job resource, directly and in combination with clinical autonomy predicted more fulfillment

and less burnout among respondents. Findings from this study are consistent with the JD-R model and demonstrate that experience level, leadership responsibilities, a positive relationship with a CP, and clinical collaboration in the setting of a positive CP relationship may all serve as important resources for PA well-being.

Limitations of the Study

Limitations of the study include sample representativeness and subscale construct validity. Less PAs in the sample identified EM as their specialty than did those certified by the NCCPA (2019a), which may have skewed well-being outcomes. Data from the 2018 AAPA salary survey revealed that respondents who identified EM as their specialty demonstrated the highest levels of both burnout and professional fulfillment (Smith, 2018). As such, lacking equivalent representation of EM PAs may alter the well-being findings of this study.

Likewise, the largest proportion of PAs in both the sample and the population practiced within a medical specialty included in the *other* category. Specialties in this category differed greatly, from hospital medicine to preventive medicine, and obstetrics and gynecology to geriatrics. As such, the study sample, like the population of PAs it is meant to represent, is characterized by high levels of specialty heterogeneity.

Another limitation rests with the construct validity of the autonomy subscale. Findings related to autonomy as a director predictor and mediating variable of PA well-being were in contrast to correlations found in several previous studies, suggesting that the autonomy subscale may have lacked construct validity. It is also possible that correlations found in previous studies may not have resulted in predictive relationships if

more robust statistical analyses, such as those conducted in the present study, would have been employed.

Recommendations

Future research should evaluate PA autonomy within a broader context. Determining measurable ways that autonomy may manifest for PAs, beyond time spent in CP consultation, would be useful. For example, assessments of the level of decision-making authority, range of permitted clinical activities, or scope of prescribing authority that PAs enjoy may result in a more valid measurement of autonomy.

The influence of both PA autonomy and leadership responsibility on PA professional well-being should be examined from different statistical perspectives in future studies. Autonomy should be considered as a potential moderator, rather than a mediator, in future studies of the relationship between years of experience and PA professional well-being. A mediator accounts for some degree of the relationship between a predictor and an outcome variable, whereas a moderator influences the strength or direction of the relationship between a predictor and an outcome variable (Baron & Kenny, 1986). In the current study, autonomy did not account for variance demonstrated in measures of PA well-being. It may have, however, strengthened, weakened, or changed the direction of the relationship between years of experience and PA well-being outcomes. PA leadership capacity should also be evaluated as a potential moderator. Aggregate leadership score may have interacted with autonomy in order to predict PA well-being and should be further explored.

Implications

The current study has implications for positive social change. It also demonstrates support for a theoretical framework that is appropriate for the future evaluation of PA well-being. Finally, findings provide information relevant to the future regulation of PA practice.

Positive Social Change

The present research has expanded the information available to employers about PA well-being, which has implications for patients living in healthcare workforce shortage areas. According to models created by researchers at the Association of American Medical Colleges (AAMC), PAs play a significant role in maintaining access to primary and preventive care services for patients in the context of looming physician shortages (AAMC, 2019). Owing to an adaptable occupational model, PAs may readily fill vacant positions or expand the capacity of physicians practice in shortage areas (Filipova, 2014; Tetzlaff et al., 2018).

In order to leverage the utility of PAs in underserved areas, employers must understand the factors that influence PA professional well-being. Burnout among physicians has correlated with problematic organizational indicators such as reduced productivity, intention to leave, higher likelihood of medical errors, and reduced personal physical and psychological health, all of which may exacerbate existing physician shortages (Dyrbye et al., 2017). Though the present study focused on the antecedents of PA well-being, it is conceivable that PA burnout may demonstrate similar outcomes. To avoid outcomes that are harmful to patients and PAs alike, employers may intervene on

aspects of PA career development known to enhance well-being. The current study

provides valuable evidence that interventions targeting enhanced autonomy, expanded

leadership opportunity, and more positive CP relationships may inspire greater

professional fulfillment and decrease or prevent burnout among PAs. Protecting the

well-being of PAs may preserve their effectiveness in providing critical access to

healthcare among underserved patient populations.

Theoretical Implications

This is the first study to evaluate PA well-being within the theoretical framework

of the JD-R model. Understanding how the JD-R model applies to PA well-being is

important because well-being researchers convened by the NAM recently published a

report advocating for system-level changes to protect the well-being of healthcare

workers (NAM, 2019). NAM researchers used a job resources model to delineate

appropriate changes. The current study provides an evidenced-based avenue for the

application of recommendations endorsed in the NAM report to the PA profession.

Implications for PA Practice

Several significant predictors of PA professional well-being were identified in the

present study. Differences in the influence of gender on leadership and CP relationships

discovered in this study were concerning. Most currently practicing PAs are female, and

yet findings from this study predict lower leadership responsibility and a more negatively

perceived CP relationship for female PAs. As the feminization of the PA profession

continues, employers should leverage career development opportunities as a way to

counteract or reverse these negative gender-based trends.

Opportunities for career development also emerged as important predictors of PA well-being. Findings provide new information about the predictive nature of PA career length on higher levels of professional fulfillment and lower levels of burnout. Also, this is the first study to evaluate the relationship between aggregate PA leadership responsibility and well-being. Importantly, PA leadership responsibility enhanced the influence of career length on professional fulfillment and burnout, suggesting that employers may enhance well-being by providing experienced PAs with opportunities for leadership. Considering the current gap in the understanding of how leadership responsibilities influence the well-being of physicians who have leadership responsibilities (Montgomery, 2016), these findings may have implications for physicians, as well.

Findings from the present study also confirmed associations between CP relationship and PA well-being previously found among smaller or more specialized samples of PAs. The value of a CP relationship is especially important to consider when current healthcare market forces are prompting advocacy for a loosening of PA supervision requirements at the state level (American Academy of PAs, 2019b). The current research affirming the influence of the CP relationship on PA well-being should inform state legislative changes related to the physician-PA team.

Conclusion

The present study provides new and salient information about antecedents to PA well-being that may support PA well-being in the context of clinical and administrative role expansion. Study outcomes inform a greater understanding among PA employers

about how career length may interact with gender and aspects of career development and CP support to produce a professionally satisfied workforce. By combining a mature career with opportunities for leadership and positive collaborative relationships, employers may augment the ability of PAs to provide critical access to healthcare for patients living in healthcare workforce shortage areas.

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Appendix A: AAPA Letter of Agreement to Release Requested Data

November 20, 2019

Kari Bernard
3226 Cassius Ct.
Anchorage, AK 99508

Dear Ms. Bernard,

I hereby agree to allow you, Kari Bernard, use of 2018 AAPA Salary Survey raw data for your research conducted at as part of your dissertation process and as part of the AAPA-PAEA Research Fellowship. I understand that the purpose of the study is to examine if experience level, level of autonomy and leadership responsibility, which could both represent aspects of role expansion, and collaborating physician relationship will predict either professional fulfillment or burnout.

By signing this letter of permission, I am agreeing that you will have access to the data collected
   a) To perform the data analysis as it pertains to your doctoral degree and the work outlined in your application for the AAPA-PAEA Research Fellowship; and
   b) to perform the data analysis both for presentation to AAPA and/or for publication purposes.

Sincerely,

Appendix B: Variables Requested from the AAPA Research Department

2018
sex
setting_primary
race
ethnicity
employer_primary
employer_hospital_allrespondents
setting_primary
NA
NA
collabmd_consult
years_total
leadership
leadership_formal
leadership_title
$leadership_respons_mrset
leadership_respons_committee
leadership_respons_hirefire
leadership_respons_performanceassess
leadership_respons_competencyassess
leadership_respons_pacredentialing
leadership_respons_workforcerequirementdetermine
leadership_respons_managesuperpas
leadership_respons_managesuperotherclinstaff
leadership_respons_managesupernonclinstaff
leadership_respons_ensurecomplianceaccred
leadership_respons_budget
leadership_respons_educatingothers
leadership_respons_qiactivities
collabMD_relationship
burnout_happywork
burnout_worthwhilework
burnout_satisfyingwork
burnout_incontrol
burnout_meaningfulwork
burnout_contributingprofessionally
burnout_senseofdread
burnout_physicallyexhausted

burnout_lackingenthusiasm
burnout_emotionallyexhausted
burnout_lessempatheticpts
burnout_lessempatheticcolleagues
burnout_lesssensitiveothersfeelings
burnout_lessinterestedtalkingpts
burnout_lessconnectedpts
burnout_lessconnectedcolleagues
burnout_workexhaustion_scale
burnout_workexhaustion_avg
burnout_workexhaustion_cutpt
burnout_disengagement_scale
burnout_disengagement_avg
burnout_disengagement_cutpt
burnout_overall
burnout_overall_avg
burnout_overall_cutpt
burnout_professionalfullment_scale
burnout_professionalfullment_avg
burnout_professionalfulfillment_cutpt
State
@6KELicensureRegTerm
@6KEFullRx
@6KEScopeDetPractSite
@6KEAdaptableSuper
@6KENoChartCoSig
@6KENoRatioRestrict
@6KENUMBER
jobs_concurrent
employer_change
specialty_change
hours_total
patients_week_all