

SLEEP DEPRIVATION LEADING TO BURNOUT AND DEPRESSION: A FOCUS
ON PHYSICIAN ASSISTANTS THROUGHOUT THE UNITED STATES

A Thesis

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Master of Science in Health Science

by

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ABSTRACT

Problem: Healthcare professionals work long hours to provide patient care. This can lead to sleep deprivation and negative effects in both health and mental state of the providers. There are numerous studies involving resident physicians on the effects of sleep deprivation leading to burnout and depression, but studies on the lifestyles of physician assistants (PAs) are lacking. **Purpose:** Determining the PA burnout rates specifically catered to each medical field can assist in detecting which specialties need additional focus. The study should concentrate on understanding the effects of long hours for varying specialties and sleep deprivation for physician assistants, along with recommendations on how to overcome these problems. **Methods:** The Effort-Reward Imbalance questionnaire and the Maslach Burnout Inventory will be combined in an assessment, which will be sent to hospitals and clinics located in each region; northwest, southwest, northeast, southeast, and midwest. The surveys will also be sent to national organizations and specialty societies. The eight major medical fields will be targeted for this study, including primary care, surgery, emergency medicine, internal medicine, dermatology, pediatrics, oncology, and OB/GYN. Each specialty in each region will have surveys from twenty hospitals. In this cross-sectional analysis, the anonymous survey will be sent to physician assistants in the selected hospitals. The hospitals will be given a month's time to complete the survey. **Outcomes:** By the end of the study, there will be data on the burnout rates for PAs each of the eight major health fields in each region. **Benefit:** The results can be applied to benefit physician assistants in determining which specialty to pursue and also help identify which fields need additional resources to improve quality of life.

BIOGRAPHICAL SKETCH

Charishma Kasipathi grew up in Carmel, Indiana with her mother and father. She received her Bachelor of Science degree in Forensics Science and a Bachelor of Arts degree in Biology from Indiana-University Purdue-University of Indianapolis. She is currently residing in the Upper East Side of Manhattan and is enrolled in the Physician Assistant program at Weill Cornell Graduate School of Medical Sciences. She worked as a rehabilitation technician at St. Vincent Hospital in Indianapolis prior to enrolling in the Physician Assistant Program. Charishma enjoys reading and exploring new coffee shops in Manhattan.

Dedicated to the Weill Cornell Physician Assistant Program Class of 2020 and all the physician assistants throughout the United States. I hope that my research will assist in choosing a field of their passion while knowing what to expect in terms of burning out and depression.

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CHAPTER I

INTRODUCTION

Healthcare providers are needed every second of every day. They are constantly challenged and pushed to their limits in order to take care of patients. Due to such high stress environments and long hours, sleep deprivation is a common phenomenon for them. Sleep deprivation can be harmful not only to patients, but also to the providers themselves. Healthcare professionals sometimes work odd hours based on the specialty and hourly requirements. There have been many studies on burnouts and depression among resident physicians, but studies on physician assistants (PAs) are rare. There should be research to understand the effects of long hours of varying specialties and sleep deprivation for physician assistants. Research should be done to understand the physical and mental toll required for PAs and how quality of life can be improved.

1.1 What is Sleep?

Sleep is an important part of daily life for all animals. It is a time period that has a reduced activity level and lowered responsiveness to stimuli compared to when awake. Compared to when one is in a coma or in a reduced state of consciousness, one can be woken up from sleep easily, depending on the person. During sleep, the mind remains active. Even though there is a decrease in the “firing” of neurons, the brain is constantly working. During rapid eye movement (REM) sleep, the person is usually dreaming and there is an increased rate of neurons being fired compared to non-REM

sleep. When one is awake, blood pressure, oxygen levels, body temperature, and blood glucose are mostly at a constant level. But during sleep, the body's demands are decreased, thus temperature and blood pressure are lowered. When one is awake, brain activity, breathing and heart rate can vary depending on the environment and the individual. During sleep, these same three components are relatively regular. ¹

1.2 Effects of Sleep

1.2.1 Body Temperature

Body temperature is controlled by thermoregulation. When one is awake, actions such as shivering and sweating change the body temperature to fluctuate around a set point. But as the body prepares to sleep, it induces sleep by releasing heat into the environment. The set point of our body is reduced in an attempt to decrease the amount of energy needed to maintain that body temperature. This temperature is at its lowest during REM sleep. ²

1.2.2 Sleep: Respiration, Cardiovascular, and Physiologic Changes

When one is awake, breathing is irregular due to a multitude of factors experienced by the individual. But during sleep, breathing is slowed down and becomes regular. There is also a reduction in heart rate and blood pressure during non-REM sleep. But during REM sleep, there is varying cardiovascular activity, which can be related to nervous system activity or dream content. Physiologic functions can be decreased or increased during sleep. Urine production and kidney activity is decreased

but other bodily functions, such as digestion, growth, and cell repair are increased, another important function of sleep. ²

1.2.3 Sleep: Brain Waves

What controls sleep and how do brain waves change during different sleep cycles? The internal biological clock and sleep-wake homeostat control the wake-sleep cycles. These two interactions explain the normal sleep schedule of sleeping at night and staying awake during the day. An invention called the electroencephalogram (EEG) helped to understand that the brain remains active at all times, even when asleep. There are two main types of sleep: REM and NREM sleep. REM sleep is considered the active type of sleep consisting of low amplitude yet high frequency waves with an alpha rhythm. As according to the name, this type of sleep also consists of rapidly moving eyes and dreams. When one wakes up during the REM cycle, they may be able to relate a dream they just had. NREM cycle sleep has three stages: N1, N2, and N3. As the stages advance, brain waves are slowed down. During this cycle, there are high amplitude and low frequency waves. This is known as the deep sleep aspect. ³

1.2.4 Sleep Cycling

When one first goes to sleep, they encounter NREM cycle first. This alpha activity starts off at N1, with low-voltage and mixed frequency patterns. When a person starts to doze off to sleep, their eye movements begin to slow, sometimes lasting from one to seven minutes. Then stage N2, signaled by sleep spindles, lasts ten

to twenty-five minutes. As the sleep cycle approaches N3, there is a higher voltage and slower wave activity. This N3 stage lasts twenty to forty minutes. The deeper one is into NREM sleep, the harder it is to wake them up or the less responsive they are to external stimuli. On the other hand, REM sleep only consists of a fifth of total sleep. Throughout the night, NREM and REM sleep cycles alternate. Initially, REM may only last a few minutes, but as the night goes on, this part of the cycle lengthens in time. The first NREM and REM cycle lasts around seventy to one hundred minutes while the second cycle lasts around ninety to one hundred twenty minutes. ³

1.3 Sleeping Patterns

Sleeping patterns change throughout one's life. Newborn sleeping patterns begin in the REM cycle, unlike adults. The alternating cycle lasts around fifty to sixty minutes, which is much shorter than adults. Nocturnal sleeping patterns and NREM stages begin to appear around the age of two to six months. Sleep patterns can also be affected by the individual and their environment. Many factors affect the patterns, such as exercise, stress, light, temperature, chemicals, age, time, and career. The quality of sleep can also be affected by varying factors, such as missing a night's sleep, drugs, and irregular sleep schedules. Alcohol, for example, causes more awakenings throughout the night, since it suppresses REM sleep early on. ³

1.4 Napping

It is common knowledge that the goal is to have a block of eight hours of sleep during the night. But many things can prevent this from occurring, such as occupation

and cultural diversity. Many cultures have afternoon naps as part of a schedule. Although it can be different based on culture, napping typically takes part during the afternoon after a meal and at the warmest part of the day. They mostly last from half an hour to an hour. If a nap consists of a longer period of time, the individual may risk going into deep sleep, thus making it difficult to be aroused again. After a nap, individuals typically feel more alert and more able to stay awake late into the night, hence they sleep for a shorter period of time compared to those who do not sleep in the afternoon or take naps. ³

1.5 The Role of Sleep

Sleep plays an active role in learning and memory. If a person is sleep deprived, they are unable to focus or pay attention, which disrupts learning and creating new memories. There are three components to learning and memory: acquisition, consolidation, and recall. New information is given during the acquisition phase. The memory or learning material is becoming stable and processed during the consolidation period. Recall is being able to access information after it has been consolidated. While acquisition and recall occur when an individual is awake, research suggests that consolidation takes place during sleep. During sleep, neural connections acquired during acquisition are strengthened to form longer lasting memories. There are two different types of memories. Declarative memories are fact/information based, which has been observed to have an increase in REM sleep. Procedural memory is forming the memory of how something is done, and REM sleep also plays an important role in consolidation of this type of memory. ⁴

1.6 Sleep Deprivation

When we become sleep deprived, it is harder to acquire and recall information. Attention span is decreased, focus is lost, and it is harder to retrieve previously learned information. Without proper sleep, the over-worked neurons are unable to process information at the capacity. This can also be said about the interpretation of new events. Sleep deprivation can also cause one to make poorer judgements not normally made on a full night's sleep. The ability to assess, plan and judge a situation is impaired with lack of sleep. It also means that neither the body nor mind is well rested, which can lead to accidents and injuries. The decreased quality and quantity of sleep can impact mood, further impeding the ability to form new information and be able to recollect it at a later time. ⁴

1.7 Sleep Deprivation and Imaging Study

Early studies were performed to observe task-related effects of sleep deprivation. An FDG PET study assessed brain glucose metabolism following 32 hours of sleep deprivation, while a visual vigilance test was given. Glucose metabolism was decreased in the temporal lobes while it was increased in the visual cortex. There was reduced performance in the visual vigilance test, corresponding to a decrease in brain glucose metabolism in the thalamus, basal ganglia, and limbic structures. This type of study was observed for various hours of sleep deprivation and different working memory tasks. Performance declined after twenty-four hours of sleep deprivation, but there was a more pronounced deficit after forty-eight hours. However, there was an increase in glucose metabolism in the visual and motor areas,

which can be a compensatory mechanism of an attempt to be more alert and perform cognitively after extended periods of wakefulness.⁵

1.8 Depression

Major depression is a concern in today's society. Classification and diagnosis depend on the following:

- Five or more of the following symptoms occur during the same 2-week period of time, and one of them includes depressed mood or loss of interest/pleasure
 - Depressed mood observed by others or the subject.
 - Diminished interest or pleasure in activities previously found interesting
 - Weight loss or decrease in appetite without intention
 - Insomnia or hypersomnia
 - Psychomotor agitation
 - Fatigue or loss of energy
 - Feeling worthless or inappropriate guilt
 - Diminished ability to pay attention
 - Recurrent thoughts of death and suicidal ideation⁶

The National Comorbidity Survey Replication also found that problems sleeping correlated to an increase suicidality risk.⁵ Many depressive symptoms consist of sleep deprivation problems. Due to the inability to sleep, judgement can be impaired, which can cause increased suicidal thoughts.

1.9 Burnout and Depression

Burnout and depression are commonly linked, along with other chronic stress-related disorders. Even though these two are similar and may have the same etiologies, there should be a way to discern the two. One study focused on finding similarities and differences between burnout and major depression by correlating them with two biological markers of stress: heart rate variability (HRV) and brain-derived neurotrophic factor (BDNF). The author used a literature search to explore the roles that HRV, BDNF, and hippocampal volume played in major depression, burnout, and stress. HRV is a parasympathetic reaction, linked to chronic stress. Hippocampal volume seems to increase transiently from short term stress, without changes due to chronic stress. Thus, HRV and hippocampal volume can be used to measure chronicity of stress. BDNF serum levels were reduced for both burnout and major depression. Although BDNF cannot be used individually as a potent biomarker, it can be combined with other gene interactions for development of underlying anxiety and depression. The review includes the roles of stress and anxiety while dealing with both genetics and environmental factors. It gathers data on how major depression and burnout, while linked, can be separated for a better understanding of a possible source. This can lead to implementing solutions to combat these problems. ⁷

Hence, it is highly important that there is research to associate burnout and depression due to sleep deprivation in healthcare professionals, with a specific focus on physician assistants. There are a number of studies on burnout and its effects on healthcare practitioners, but no research compared different levels of burnout based on the PA's specialty.

CHAPTER II

LITERATURE REVIEW

2.1 Methods

The search initially began by using Weill Cornell Medicine Online library database, OneSearch. Unfortunately, there were too many results, with some searches yielding as many as 50,000 results. Even after using filters and restrictions, there were too many results to accurately discover relevant articles for the study. PubMed was then used as the database for the search criteria. The literature search began with searching “physician assistant” and “burnout”. Later on, other descriptions were added to the list, such as: “sleep deprivation”, “depression”, and “healthcare professional”. These terms were used with ‘AND’ so multiple descriptions could be correlated together for optimum results.

The next set of search results were used to find resources on “managing burnout” and “reducing burnout”. An additional criterion, “United States”, was added to only focus on management of burnout within the United States.

Initially, these keywords were used, but then filters and restrictions were added to narrow the search results to what would be relevant to the study. These filters excluded articles that were not in English, had only an abstract to the study, or contained restricted access, retracted articles, or clinical review articles. Other filters, such as “published in last 5 years” and “humans” were used so that older dated articles and animal studies were excluded in the results. Table 1 shows the phrases searched, the specific restrictions used, and the number of results obtained.

2.2 Results

Table 1: Search Results from PubMed

Search Terms	Restrictions	Number of Articles
Healthcare professionals AND burnout	Free full text; Published in last 5 years; Humans	659
Healthcare professionals AND sleep deprivation	Free full text; Published in last 5 years; Humans	43
Healthcare professionals AND sleep deprivation AND burnout	Free full text; Published in last 5 years; Humans	3
Physician assistant AND burnout		71
Physician assistant AND burnout AND depression		9
Physician assistant AND burnout AND sleep deprivation		0
Physician assistant AND burnout	Free full text; Published in last 5 years; Humans	12
Physician assistant AND depression	Free full text; Published in last 5 years; Humans	13
Physician assistant AND burnout AND depression	Free full text; Published in last 5 years; Humans	1
Physician assistant AND sleep deprivation	Free full text; Published in last 5 years; Humans	1
Healthcare workers AND managing health	Free full text; Published in last 5 years; Humans	879
Healthcare workers AND managing health AND United States	Free full text; Published in last 5 years; Humans	225
Reduce burnout AND healthcare	Free full text; Published in last 5 years; Humans	45

2.3 Discussion

A total of 9 articles were used for this literature review. After filtering the results and eliminating the sources not relevant to the topic, these 9 sources were used to expand on the idea of burnout in PAs, how sleep deprivation and depression play a role in it, and what can be done to prevent burnout.

Burnout in physician assistants, similar to other healthcare professionals, can lead to risk for chronic disease, diminished patient care, and poor mental/physical health. The purpose of the study by Benson et al was to assess the occurrence and reason for burnout among rural PAs. The authors used electronic surveys, including the Maslach Burnout Inventory (MBI) and Human Services Survey, to assess burnout. The MBI consisted of emotional exhaustion, depersonalization, and personal accomplishment. The data set consisted of 161 participation surveys, where 64% of the participants experienced moderate to high levels of emotional exhaustion. Another 64% experienced moderate to high depersonalization habits while another 46% displayed low to moderate levels of personal achievement. Another part of the study focused on what may cause burnout in rural practicing PAs, where one of the main causes was increased administrative workload on top of their clinical work.⁸

A limitation of the study is the number of participants and the quality of the experimental group since it only contained those that voluntarily sent in surveys. Its strength rests in questioning the type of exhaustion and sources of the cause. The study observed how the burnout was like the burnout experienced among emergency medicine PAs. This study helps to see another perspective. It focuses on rural physician assistants instead of just those working in urban areas, portraying similar

levels of burnout and stress regardless of location. It is another field that can lead to diminished patient care, hence taking a chance to study a different pool of participants can help understand burnout among physician assistants. ⁸

A study by Osborn et al was also focused on PA burnouts, but was specifically focused on PAs that worked in primary care in the state of Minnesota. It was stated that primary care is known to be one of the highest burnout specialties and, due to a large number of primary care physicians soon to retire, there will be a shortage of primary care providers (PCP). Due to the ability to change specialties as a PA, there are many willing to work as a PCP. But the question remains if the burnout rate is similar to that of physicians in primary care. This study used the Maslach Burnout Inventory, along with unique questions, and sent a cross-sectional survey to 1166 practicing PAs, which is about 52% of the 2242 licensed in Minnesota. The study used chi-square analysis to compare burnout level of primary care and nonprimary care fields. ⁹

Of the surveys sent, 312 were used for analysis, in which nearly a third of the respondents signified primary care specialty, a combination of family medicine and general internal medicine. Nearly 47.5% of those that worked in primary care expressed emotional exhaustion, more than other specialties. Depersonalization and personal accomplishment had similar data results for primary care and other fields. Using the Spearman rho correlation coefficient, it was determined that, with increasing age and practice years, PAs are more prone to depersonalization. It was also observed that female primary care PAs had a higher level of emotional exhaustion compared to both male primary care PAs and those of other specialties. It is speculated that

excessive workload, loss of control over work, work-life balance problems and administration exhaustion is correlated to high levels of burnout among primary care PAs. One of the main limitations of this study was not being able to distinguish burnout among the other PA specialties since survey turnout was low.⁹

Not only has burnout been associated with emotional exhaustion and depersonalization, but medical errors, job turnover, substance abuse and suicidal ideation have resulted due to burnout. A study in the Journal of the American Academy of Physician Assistants (JAAPA) evaluates burnout, job satisfaction, and stress of physician assistants, along with determining differences between male and female PAs. The data for this study was collected from the 2016 American Academy of PAs salary survey. The questions were analyzed and solicited using the Likert scale, with descriptive statistics containing means, medians, and standard deviations. The actual questions related to stress, happiness, and dimensions of burnout. The results, from 15,999 PAs, were estimated to be 15% of all PAs in the United States, which is a major strength of the study. Out of all the stressors, income being high enough and too many work hours were rated the highest. Although many of the participants portrayed burnout, more than 75% stated that they were happy with their career. Thirteen percent of PAs had considered leaving the job due to stress, which can disrupt quality and accessible patient care.¹⁰

As another part of the study, females had a higher chance of quitting due to stress. This is a limitation of the study since stress levels differ by specialties, hence a more female-prominent field might have a higher incidence of quitting. There is also a nonresponse bias since the answers of non-responders might vary greatly from those

who responded. This study provides an idea of work life of physician assistants. This study helps evaluate burnout among PAs, but also focuses on stratification of stress by gender and how happiness also has a value in assessing burnout. ¹⁰

Even through stress, many PAs enjoy their careers. But it also depends on the practicing specialty. Due to a high burnout rate for physicians in the fields of oncology, a study done in the *Journal of Oncology Practice* strives to assess and measure characteristics of burnout for oncology physician assistants. The researchers used a national survey, consisting of the Maslach Burnout Inventory, from 2015 to 2016. The participants were identified from the Association of Physician Assistants in Oncology membership database, where a total of 250 completed the survey. Based on the results, 34.8% of PAs reported burnout, 30.4% reported high emotional exhaustion, 17.6% reported high depersonalization, and 19.6% reported a low sense of personal accomplishment. PAs who thought their salaries were fair had a lower burnout rate while those who did not feel valued by their supervising physician had a higher burnout rate. This study's strength lies in its use of multivariable analysis for age, time with patient care, oncology specialty, and physician relationship as factors for burnout, thus there was 86.4% career satisfaction. Again, the limitation with this study is the participation pool being those who submitted the completed form, which was a response rate of 29.2%, hence there may be a nonresponse bias. Also, this was a specific time period of study, so variables such as time cannot be considered when observing burnout for oncology. ¹¹

Overall, this study will help as a comparison with the rural physician assistant burnout rate study. These two can be used to understand burnout rates among different

fields and demographics for careers as physician assistants. Studies such as these can help assess causes for burnout and help implement strategies to lower stress levels and burnout.

A study in Germany aimed to assess how psychosocial working conditions are associated with poor health outcomes and diminished patient care for physician assistants. Early qualitative studies have shown that poor working conditions led to poor patient care. A total of 994 physician assistants were surveyed using a 17-item effort-reward imbalance (ERI) questionnaire. The goal was to measure health outcomes, self-care and whether or not the participant wanted to leave the profession. Work stress ERI was 73.77%, associated with elevated signs of depression, low self-care, anxiety, lower patient care including medical errors, and a greater desire to leave the profession.¹²

In this study, it was commonly observed to have high effort with low rewards for the PAs. A strength of this study was the use of a PA-specific pool of suitable questions, which were then reviewed by PAs. This study also assessed the link between work stressors and patient care with the intention to leave the career. The study is cross-sectional, and there was a wide distribution of the survey so a response rate could not be measured. Even though the subjects of this study were physician assistants in Germany, it incorporates the same kind of stressors and risk factors for burnout and depression as those in the United States.¹² This study not only addresses the need for change for the high work stress, it also links health, satisfaction, and patient care with the environment of the PAs. This statement can be applied to the United States, in that the work and environmental factors determine job satisfaction

and mental health for healthcare professionals. A limitation to this study is how these regulations and practice parameters might differ for practitioners in the USA.

Mental health can be a combination of multiple factors, one of which is sleep. Impaired performance, cognitive deficits, reduced psychomotor vigilance, and workplace errors and injuries have been associated with sleep deprivation. It has also been linked to both errors in trainees and plausible data addressing outcomes in interventional cardiology. This interventional cardiology study assesses the link between sleep deprivation and patient care in interventional cardiology. One of the largest studies was the National Cardiovascular Data Registry analysis where 1,509,096 percutaneous coronary intervention (PCIs) were evaluated for bleeding complications and mortality rates. Another study, done at the Geisinger Medical Center, observed PCI performed during nights and those done the next day over a span of five years. From this study, there was a higher crude mortality in the group that was sleep deprived. Extended work hours and long night shifts have an associated increased risk of injury for interns.¹³

Sleep deprivation also takes a toll on the providers' metabolism, their inability to concentrate along with attention deficits, lack of energy and empathy, and malaise. This study has many strengths. It analyzes the effects of sleep deprivation on multiple variables: patient care, provider's health, in-hospital mortalities, and possible healthcare professional injury. One of the main limitations is no new empirical data from the authors. Even though they compiled data and information relating to sleep deprivation, they fail to address how this can affect a wide range of specialties instead of just interventional cardiology.¹³ These studies can also be used for other healthcare

professionals in other surgical areas. This study portrays the effects of sleep deprivation and its link to depression, diminished patient care, and burnout, which is where the topic of study is headed. This information can be used to improve job satisfaction and aim at interventions that can be implemented for decreased burnout rates.

Due to stress, burnout, and depression, PAs are prone to lifestyle risk factors, such as unhealthy diet, smoking, too much alcohol consumption, and physical inactivity. These can lead to chronic disease, impacting PAs negatively. The University of Pittsburgh Medical Center (UPMC) designed a five-year observational study to evaluate how *MyHealth* impacts UPMC's healthcare workers. It uses subgroup analyses and propensity matched pair comparisons to interpret the program effects more accurately. This program had 13,627 UPMC employees complete a Health Risk Assessment in 2007 and then again in 2011. They participated in wellness and preventive care activities required for an annual audit on their health insurance deductible. They were then compared to 4448 other healthcare employers outside of UPMC, who represent the control group. ¹⁴

Health risk was improved in the experimental group, with reduction of costs when participants moved from higher risk to lower risk for chronic disease. Overall, 10.6% of members increased their risk levels while 13.6% of members reduced their risk levels and 76.4% maintained it. The study contained a large participation pool and a five-year observation period to try to notice change in risk factors. But there is a selection bias for the participants, and it is difficult to measure the impact of health and cost outcomes based on the intensity of the program. Overall, this study showed

improved health risks for the healthcare providers in the program.¹⁴ Maybe, by implementing wellness programs such as *MyHealth* in other hospitals, healthcare professionals may improve their lifestyles and lower their chances for depression and other chronic diseases.

Physician burnout rates, similar to rates for physician assistants, have been increasing. A *Mayo Clinic* article proposes nine organizational strategies to promote engagement among physicians. Engagement is “the positive antithesis of burnout and is characterized by vigor, dedication, and absorption of work.” The first step is to acknowledge the problem to better assess the reason for burnout in order to create for a solution. The second step is to harness the power of leadership, meaning the behaviors of supervisors are adapted to those working together. The third strategy is to develop targeted interventions, such as solutions to inefficiency. Step four is to cultivate a community at work to have a professional identity and to deal with challenges as a team. Step five is to use rewards and incentives wisely, since that can cause a temptation to take shortcuts for a reward. Step six is to align values and to strengthen the culture of the environment’s mission. This helps organize and establish values and principles of the employees. Strategy seven is to provide flexibility and work-life integration by tailoring their work with both professional and personal responsibilities. Step eight is to provide resources to promote resilience and self-care so that these healthcare professionals can help care for themselves and become efficient. Step nine is to facilitate and fund organizational science to reduce burnout and promote engagement. But this study is limited to the results from Mayo Clinic and there are no sources to reliably know if these strategies have worked in all fields of

medicine.¹⁵ The research topic can implement these changes to observe a variation in burnout rates among physician assistants in diverse fields.

2.4 Implications for Further Research

Even with numerous studies on PA burnout and job satisfaction, there is a lack of research on burnout based on specialty. There should be research to understand the effects of long hours of varying specialties and sleep deprivation for physician assistants. Research should be done to understand the physical and mental toll required for PAs and how quality of care can be improved. Studies should focus on how to overcome problems PAs face daily.

CHAPTER III

RESEARCH PROPOSAL

3.1 Aims

3.1.1 Project Overview

More research is necessary to determine the specific PA burnout rates associated with each medical field. It should focus on understanding the effects of long hours for varying specialties and sleep deprivation for physician assistants, along with recommendations on how to overcome these problems. A burnout assessment for each region for eight major PA specialties is proposed through a cross-sectional analysis. These results can be used by PAs when determining which specialty to pursue and can help identify which fields need additional resources to improve quality of life.

3.1.2 Research Questions

Question One: What are the burnout rates for major PA specialties, including primary care, surgery, emergency medicine, internal medicine, dermatology, pediatrics, oncology, and OB/GYN?

Question Two: How do various burnout rates for each specialty affect patient care?

Question Three: How do high burnout rates affect quality of life for physician assistants?

3.1.3 Specific Aims

AIM 1: Prepare an assessment to test burnout rates and quality of life for physician assistants, throughout the United States, for each major specialty.

AIM 2: Distribute assessments to various departments and hospitals across the nation, for all PAs, to ensure capture of all 8 practice areas.

AIM 3: Perform statistical analysis for the physician assistant assessments.

AIM 4: Use the results to understand burnout rates for various departments/medical fields, to help improve quality of life and to selection a career specialty.

3.1.4 Hypothesis

Null Hypothesis: High burnout rates, in conjunction with sleep deprivation and varying long hours, have no correlation to quality of life for physician assistants in all eight major medical fields throughout the nation.

Alternative Hypothesis: High burnout rates, in conjunction with sleep deprivation and varying long hours, negatively correlate with quality of life for physician assistants in all eight major medical fields throughout the nation.

3.2 Background and Significance

3.2.1 Background

Healthcare professionals sometimes work odd hours based on the specialty and hourly requirements. There have been many studies on sleep deprivation leading to burnout and depression among resident physicians, but

few are focused on physician assistants. There should be research to understand the effects of long hours of varying specialties and sleep deprivation for physician assistants. There are studies that focus on oncology or revolve around PAs in rural areas. These studies have used the Maslach Burnout Inventory (MBI) and Human Services Survey to assess burnout. The MBI measures emotional exhaustion, depersonalization, and personal accomplishment. The data showed that 64% of the respondents experienced moderate to high levels of emotional exhaustion. Another 64% experienced moderate to high depersonalization habits while another 46% displayed low to moderate levels of personal achievement. ^{1,4,8}

3.2.2 Project Significance

Due to sleep deprivation, burnout, and depression, physician assistants are prone to lifestyle risk factors, such as unhealthy diet, smoking, too much alcohol consumption, and physical inactivity. Research should be done to understand the physical and mental toll required for PAs and how quality of life can be improved. Hence, it is highly important that there is research to associate burnout and depression due to sleep deprivation in healthcare professionals, with a specific focus on physician assistants. Not only has burnout been associated with emotional exhaustion and depersonalization, but medical errors, job turnover, substance abuse and suicidal ideation are also resulting due to burnout. This study's purpose is to assess which specific medical fields show high burnout rates and use national recommendations to

help decrease these rates to improve quality of life. This information can also be used by PAs looking for new a specialty. The results can be used to identify which specialty in which location might be a better choice for a career. Since PAs have the opportunity to change specialties, the outcomes of the assessment can benefit physician assistants throughout the nation.

3.3 Preliminary Studies

Not Applicable

3.4 Research Design and Method

3.4.1 Design

For this study, a cross-sectional survey will be used to evaluate the eight major medical fields. The assessment will contain an Effort-Reward Imbalance questionnaire and the Maslach Burnout Inventory.

3.4.2 Methods

3.4.2.1 Participants

The participants will be all physician assistants in the eight major medical fields: primary care, surgery, emergency medicine, internal medicine, dermatology, pediatrics, oncology, and OB/GYN. Hospitals will be selected from five regions: northwest, southwest, northeast, southeast, and midwest. Twenty hospitals, for each specialty, from each of the five regions will be selected to distribute the assessments to all PAs. These hospitals must have

physician assistants and they will be selected from varying parts of the regions for a better distribution of data. The assessments will be anonymous; thus, the hospitals will not know the true purpose of the study until after the data has been evaluated. To avoid a skew of results from only inpatient environments, the surveys will also be sent to clinics and PA national organizations, including specialty societies.

3.4.2.2 Variables

The eight major medical specialties will be one of the varying factors. This is to be able to distinguish the burnout rates specifically for each specialty. They can also be used to determine which field to select as a career. Another variable is the locations of hospitals since they are selected from distinct parts of each region in the United States. Each region must have twenty hospitals for each specialty; therefore, some hospitals can be used for more than one specialty. Clinics and national organizations will also be used.

3.4.2.3 Outcomes

The Maslach Burnout Inventory (MBI) will be used to assess the burnout rates. This aims to help people live better by offering assistance, preventing harm, and treating physical, emotional or cognitive problems. There will also be a portion of the assessment that contains a text box to include any major life events that had recently occurred. This can also help to understand how life changes affect burnout rates, and in turn, depression. An Effort-

Reward Imbalance (ERI) questionnaire will also be part of the survey to evaluate health outcomes, self-care and whether or not the participant wanted to leave the profession. This survey questions effort (stress), over-commitment (personal sacrifices), and reward (salary). This can also help gauge patient care in relation to healthcare, along with measuring self-care for the healthcare professionals.

3.4.2.4 Randomization/ Blinding

This is a cross-sectional study where physician assistants are specifically surveyed. A selection bias is avoided by assessing a random sample of PAs working in each specialty area. Neither the participants nor hospitals will be told that the assessment is to evaluate burnout and depression for physician assistants.

3.4.2.5 Follow-Up

The primary audience for the outcomes will be physician assistants; however, if specific hospitals request data pertaining to other healthcare professions, the results can be delivered.

3.4.2.6 Complications

Complications can include not having enough participation. If the hospital chosen consisted of few or no physician assistants, then there will be a

major bias for those specialties in that region. Henceforth, careful review of the final PA participation list should be accomplished.

3.4.2.7 What is Being Surveyed

Burnout rates and mental health based on sleep deprivation are being evaluated for physician assistants throughout the nation. The anonymous assessment would include information such as healthcare career, medical specialty, and duration in that field. The mental health portion surveys health outcomes, self-care and whether or not the participant wanted to leave the profession.

3.4.3 Statistical Analysis

A chi square test for association will be used to reject or accept the null hypothesis for the nominal data provided. Independent variables include both the region and the medical specialty while the dependent variables are MBI and ERI. Descriptive statistics will also be used to measure mean of the interval/ratio data. Once acquired, a one-way ANOVA will be used to compare the differences in means for the data acquired. A priori power analysis in G*Power was calculated to determine the sample size based on the eight practice specialty comparison groups. The minimum sample size was computed to be 210 participants per geographical region.

3.4.4 Limitations

One of the limitations includes when the participants take the assessment. Providers who take it at the end of their shift may score a higher burnout rate than those who have just started their shift. Those that have just had a vacation may score a lower burnout rate than those who have not. To combat this, the assessment will be sent at a time away from major holidays. There will also be instruction to submit the assessment at the middle of the shift for accurate results and to prevent variations based on timing of shiftwork. They may also be given the option of completing it outside of work hours to decrease the burnout caused by this additional administrative task.

Another limitation is not knowing if certain hospitals have already put standards in place to prevent burnout and depression. These hospitals may or may not have lower burnout and depression rates. It will also be difficult to gauge if the standards are successful or not. Another challenge is repeat participants. A reminder to take the assessment will be sent within two weeks of originally beginning the study. If participants do not remember completing the survey the first time, they may repeat it. Since the evaluation is anonymous, it may skew the results. To prevent this a warning will be sent with the reminder to prevent or decrease duplicate surveys.

Since surveys will be sent to national organizations as well, there is a chance of repeat participants. There will be a warning at the beginning of the surveys to prevent this from occurring. Since this survey is obtained in a span of one month, it is hypothesized that participants will remember participating.

3.4.5 Timeline

The research will need to be approved by the Institutional Review Board between the months of June and September 2020. The assessment will be given to the hospitals in the month of October 2020, before the holiday season. The deadline for submitting the assessment will be thirty days. Within this time frame, a reminder will be sent to complete the evaluation after two weeks of initially sending the assessment. The data will be analyzed until the end of December 2020 and sent for publication in January 2021.

CHAPTER IV

CONCLUSION

Physician assistants are constantly challenged and expected to go above and beyond in order to take care of patients. This creates a high stress environment with long hours and sleep deprivation, which can lead to burnout and depression. There are numerous studies on these effects in resident physicians, but studies on the lifestyles of physician assistants are lacking. Henceforth, it is highly important that there is research to associate burnout and depression due to sleep deprivation in healthcare professionals, with a specific focus on physician assistants.

Determining the PA burnout rates specifically catered to each medical field can assist in detecting which specialties need additional focus. It should focus on understanding the effects of long hours for varying specialties and sleep deprivation for physician assistants, along with recommendations on how to overcome these problems. An assessment will be composed of the Effort-Reward Imbalance questionnaire and the Maslach Burnout Inventory. It will then be sent to hospitals in each region, with about twenty hospitals for each specialty in each region. The primary focus is physician assistants since this is a cross-sectional analysis. The hospitals will be given a month's time to complete the survey.

Recommendations on how to improve burnout rates should focus first on medical fields with the greatest amount of burnout and depression. A burnout assessment for each region for eight major PA specialties is proposed through the cross-sectional analysis. The goal is for the results to benefit PAs in determining

which specialty to pursue and also help identify which fields need additional resources to improve quality of life.

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