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Physician Stress: Is the Electronic Health Record to Blame?

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PHYSICIAN STRESS: IS THE ELECTRONIC HEALTH RECORD TO BLAME?

A Dissertation
Presented to
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By
Zachary Ward

May 2019
PHYSICIAN STRESS: IS THE ELECTRONIC HEALTH RECORD TO BLAME?

Date Recommended 2-26-19

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Words certainly cannot convey how lucky I truly am to have the family I have. Their support and love are more than most will ever have. I am fortunate to have their support to chase my passions and live life to the fullest. Specifically, I wish to dedicate this work to the following individuals:

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TABLE OF CONTENTS

LIST OF TABLES ........................................................................................................viii

ABSTRACT ...................................................................................................................x

CHAPTER I: INTRODUCTION .........................................................................................1

Introduction ..................................................................................................................1

Statement of Problem .................................................................................................3

Purpose of Study .........................................................................................................6

Research Questions ....................................................................................................7

Significance of Study .................................................................................................8

Limitations ..................................................................................................................9

Definitions ..................................................................................................................9

Chapter Summary ....................................................................................................11

CHAPTER II: LITERATURE REVIEW .............................................................................12

Introduction ................................................................................................................12

Burnout ......................................................................................................................12

Physician Burnout .....................................................................................................15

Organizational Importance of Burnout .....................................................................18

Physician Burnout Consequences .........................................................................19

Mitigating Burnout ....................................................................................................24

Electronic Health Record ........................................................................................27

Consequences of Technology .................................................................................30

Chapter Summary ....................................................................................................31
CHAPTER III: METHODOLOGY

Introduction .................................................................................................................. 32
Research Questions ..................................................................................................... 33
Study Design ................................................................................................................ 34
Procedures .................................................................................................................. 45
Study Participants ....................................................................................................... 45
Data Analysis Methods and Tools ............................................................................. 46
Chapter Summary ....................................................................................................... 46

CHAPTER IV: RESULTS

Introduction .................................................................................................................. 47
Research Questions ..................................................................................................... 50
Research Question 1 .................................................................................................... 50
Research Question 2 .................................................................................................... 56
Research Question 3 .................................................................................................... 58
Research Question 4 .................................................................................................... 60
Chapter Summary ....................................................................................................... 62

CHAPTER V: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Introduction .................................................................................................................. 64
Discussion of Findings ................................................................................................. 64
Research Question 1 Findings ..................................................................................... 64
Research Question 2 Findings ..................................................................................... 65
Research Question 3 Findings ..................................................................................... 65
Research Question 4 Findings ..................................................................................... 66
Implication of Findings

Limitations

Recommendations for Healthcare Leaders

Recommendations for Future Research

Chapter Summary

REFERENCES

APPENDIX A: Invitation Email Example

APPENDIX B: Survey Instrument

APPENDIX C: IRB Approval Letter

APPENDIX D: Survey Email Example

APPENDIX E: Copenhagen Burnout Inventory Scoring
LIST OF TABLES

Table 1. Questionnaire Before Validity/Reliability Evaluation.............................................37
Table 2. Content Validity of Questionnaire .............................................................................39
Table 3. Test/Retest of Multiple Choice Questions.................................................................43
Table 4. Email Blast Statistics..................................................................................................45
Table 5. Study Participants by Gender.....................................................................................49
Table 6. Study Participants by Practice Type...........................................................................49
Table 7. Respondent Mean Age and Mean Years Practicing.....................................................50
Table 8. Copenhagen Burnout Inventory and Scale Scoring and

   Recommendations by Scale..................................................................................................51
Table 9. Copenhagen Burnout Inventory Subscale Mean Scores by Gender..........................52
Table 10. Copenhagen Burnout Inventory Subscale Mean Scores by Years Practicing..........52
Table 11. Copenhagen Burnout Inventory Subscale Mean Scores by Practice Type..............53
Table 12. Personal Burnout Classifications by Physician Practice Type.................................54
Table 13. Work Burnout Classifications by Physician Practice Type........................................55
Table 14. Client Burnout Classifications by Physician Practice Type........................................56
Table 15. Electronic Health Record Satisfaction Subscale Mean Scores by Gender................57
Table 16. Electronic Health Record Satisfaction Subscale Mean Scores by Years Practicing......57
Table 17. Electronic Health Record Satisfaction Subscale Mean Score by Practice Type........58
Table 18. Correlation of Electronic Health Record Satisfaction and Patient Care.................59
Table 19. Strengths Identified of the Electronic Health Record.............................................61
Table 20. Weaknesses Identified of the Electronic Health Record.................................62
The purpose of this study was to explore the potential relationship between Family Medicine physician burnout and the electronic health record. To do so, this study utilized the Copenhagen Burnout Inventory to assess burnout among physicians, along with specific questions regarding usage of the electronic health record and measurement of physician perceptions of the electronic health record. Members of the Kentucky Academy of Family Physicians were sent two separate invitations to participate in the study twice over a one-month period via email.

The study yielded no significant differences in Family Medicine physician demographics and their degree of burnout, or the satisfaction of the electronic health record and Family Medicine physician demographics. This study, however, identified some common themes. Most specifically, Family Medicine physicians experience a very high degree of work-related burnout. Further, there is a very close relationship between work-related burnout experienced by the Family Medicine physicians studied in this survey and the electronic health record, as nearly all the components and attitudes measured toward the electronic health record significantly correlated with work-related burnout as measured by the Copenhagen Burnout Inventory.

The findings of this research have implications for healthcare administrators. Healthcare leaders, regardless of their role, must be attuned to the issues surrounding physician burnout. Not only should these leaders be aware of physician burnout, but also,
they should be cognizant of possible ways to mitigate the stresses physicians experience as a result of their work.

Possible avenues to mitigate burnout in Family Medicine physicians include utilizing scribes for electronic health record documentation and management, utilizing a team approach to patient care with the clinic staff, and other various interventions. More research, however, is needed to identify additional pathways to mitigate physician burnout.
CHAPTER I: INTRODUCTION

Introduction

Physicians today are experiencing more burnout and disenfranchisement than ever before. Insurance companies are more controlling of what diagnostic tests are necessary, there are more government regulators to appease, there is a growing trend toward employed practices (compared to solo practice), and the implementation of the electronic health record. All of these factors have greatly affect how a physician practices medicine today (Lathrop, 2017).

For centuries, the stethoscope has been the tool physicians have relied on to offer a quick assessment of their patient. A quick listen to the lungs and heart gave the physician a window into their patients’ health. While that is still true today, the rise of a new tool is giving the stethoscope some competition: the computer. Today, a visit to the doctor is not complete without the physician entering some data into a computer while in the patient exam room and additional notations well after the patient leaves.

The practice and delivery of medicine has radically changed within the last decade. Physicians can now see diagnostic results in real time, patients can schedule appointments from their smartphone, and prescriptions can be sent to a pharmacy with a few clicks of a mouse. As more complex technologies have been developed to care for patients, the opportunity for more efficient, cost effective, and safer medicine has emerged. However, as is the case with technological disruptions, there have been some unintended consequences due to recent technology introduced to healthcare.

Some have theorized this technology is the cause of additional stresses on healthcare workers, namely physicians. The way a physician interacts which his or her
patient has drastically changed in the last decade, with some arguing they interact with a computer screen more than their patient. This dramatic change has brought dissatisfaction to many physicians.

The mainstream media has reported on the topic of computer proliferation into the practice of medicine in recent times. In 2018, an article in the New Yorker questioned the relationship of electronic health record platforms with physician job dissatisfaction (Gawande, 2018). Ironically enough, the article was titled “Why Doctors Hate Their Computers.” Countless other articles in the lay press have relied on anecdotal information to support a relationship with the electronic health record and physician.

The electronic health record is meant to be a one stop tool for healthcare organizations. According to Healthit.gov, the advantages of an electronic health record platform are multiple, including more reliable prescribing, providing quickly accessible and up-to-date medical information on patients, improving health information security, sharing relevant patient information with other clinicians, and enabling practices to improve efficiency and meet business goals (“What are the advantages of electronic health records,” 2018).

The national government helped usher advanced technology into the healthcare setting. The Health Information Technology (HITECH) Act, which was signed into law in 2009, mandated hospitals and physicians to use electronic health records through meaningful ways to accomplish tasks. Reimbursement also is tied to electronic health record implementation. According to Jha (2010), the government mandating meaningful use of electronic health records translates into $30 billion in both incentives as well as reduced payments for non-compliance to healthcare organizations.
While this additional electronic health record technology has offered numerous benefits, drawbacks also are coming to light. Patients complain physicians do not spend enough time with them during visits (Yarbrough & Smith, 2007). Physicians complain of the amount of clerical time required for documentation, the amount of sifting through screens of irrelevant data, and the shear time it takes to complete documentation (Loria, 2018). Interestingly, Shanafelt et al. (2015) reported that, between 2011 and 2014, physician burnout rates rose from 45.5% to 54.4%. During the same time frame, certified electronic health record systems in use rose from 71.9% to 96.9%. The correlation between these two separate facts certainly presents enough justification to warrant further research.

To date, there has been no quantifiable study that has examined the electronic health record’s influence and impact on physician burnout in any specialty. Given that the electronic health record has permeated nearly every aspect of the American healthcare system and physician burnout rates are steadily rising, research into this field is warranted.

This chapter introduces the problem of significant stresses placed on physicians in the modern healthcare environment where technology is increasingly leveraged. Further, this chapter explains the research questions guiding the quantitative and qualitative study of family medicine physician burnout and perceptions of the electronic health record.

Statement of Problem

Physician burnout is a topic which has garnered much attention over the last few years. To illustrate the prevalence of the issue, during a meta-analysis of the topic, West
and colleagues were able to identify 2617 articles that discussed physician burnout (West, Dyrbye, Erwin, & Shanafelt, 2016).

Current research has pointed to a relationship between physician burnout and the electronic health record. Leading the research, Shanafelt et al. (2016) alluded that numerous aspects of the electronic health record could be responsible for increased physician burnout. Specifically, the authors indicated increased electronic prescribing (known as e-prescribing) and electronic patient portals (which allow patients to interact with providers and physician order entry) are a few features that require additional time of the physician to rectify.

Physician burnout has systemic effects on healthcare organizations. Increasing research has indicated physician burnout affects physician retention and turnover (Lee, Seo, Hladkyj, Lovell, & Schwartzmann, 2013). Further, according to Shanafelt, Goh, and Sinksky (2017), numerous studies have indicated physician burnout is the largest determining factor in their decision to leave their current job over the next two years. The costs of recruiting a physician can be difficult to ascertain. Schutte (2012) suggested it costs upwards of $80,000 for an organization to replace a physician. According to Shanafelt et al. (2017):

Physician turnover results in substantial expense to healthcare organizations. Turnover results in both direct costs associated with recruitment, as well as lost revenue during recruitment, onboarding, and the time it takes a new physician to reach optimal efficiency in a new system. Historical studies suggest that the cost to replace a physician is 2 to 3 times the physician’s annual salary. A 2012 report from the Association of Staff Physician Recruiters indicated the average “hard
“costs” associated with recruiting a physician (e.g. Recruiting agency fees, advertisements, interview costs) are $88,000 before factoring in lost revenue during the recruitment and onboarding process. The actual lost revenue for 1 Association of Staff Physician Recruiters client was $990,000 per full time-equivalent physician, similar to Atrius Health’s recent report that their organization cost to replace a physician as $500,00 to $1,000,000. (p. 1827)

The financial costs of recruitment come at a time of increasing overall operating costs for healthcare organizations, as well as more competitive payment/incentive models from healthcare payors such as Medicare and private insurance. Given this, it makes logical sense that healthcare leaders examine every option to decrease their overall expenses.

Physician burnout is a significant issue facing the American healthcare system as a whole. The issue has been associated with problems such as medical errors, quality of care delivered, lower patient satisfaction, poor patient outcomes, and lower retention rates (Lee et al. 2013; Willard-Grace et al. 2014). This literature, however, takes all specialties and aggregates it into the whole picture. There is little, if any, known research which examines burnout of a specialty in light of the electronic health record.

The role of the primary care physician is actually expanding. In 2007, the Institute for Healthcare Improvement (IHI) launched the triple-aim initiative that quickly became synonymous with quality in the United States. The components of the initiative are as follows: improving health of communities, improving care experience, and reducing costs. Primary care physicians have a unique role in these initiatives, as they can impact all three.
Currently, there is a lack of research that examines the degree and extent the electronic health record may have on primary care physician burnout. Several studies have alluded to potential relationships; however, there is a dearth of research that addresses the facts at hand with the electronic health record and burnout. Moreover, there is a lack of research that utilizes an established burnout inventory to gauge physician burnout. Schwenk and Gold (2018) suggested most studies utilize abbreviated versions of established burnout inventories (such as the Maslach Burnout Inventory). These abbreviated inventories, which are only one or two questions, are not adequate to accurately gauge physician burnout (Schweck & Gold, 2018).

It’s worth noting that the majority of physician burnout research has been conducted by physicians. This research, conducted by a non-physician, gives the field of healthcare leadership a new perspective and approach to the subject. Healthcare administrators must begin to do more in terms of physician engagement. Research discussed in this study points to the costs and other negative issues associated with physician burnout. Understanding burnout is the first step for healthcare administrators when developing a plan to address physician engagement.

**Purpose of Study**

Numerous studies have been conducted on the specific conditions that cause burnout, occupations which may be subjected to burnout, reactions of people afflicted with burnout, etc. Simply stated, there is no shortage of literature in the field of burnout in general. However, given that widespread usage of the electronic health record is somewhat of a recent phenomenon, as alluded earlier, there is a dearth of research exploring the unintended effects on physicians and the implications of those effects on
health organizations. The purpose of this study is to analyze what extent and which components of the electronic health record may impact primary care physician burnout.

This mixed-methods study utilizes a validated inventory to provide a tangible burnout measurement, while also examining general and specific attributes of the electronic health record. In turn, this provides an overall illustration of generalities and specifics of the relationship of the electronic health record associated with burnout in primary care physicians.

**Research Questions**

This study’s purpose is to better understand the relationship between Family Medicine physician burnout and the electronic health record. This study is guided by a primary research question: Is there a relationship between the physician’s attitude with electronic health record and burnout measured by the Copenhagen Burnout Inventory? To answer that overall research question, a four-research question subset has been developed. Those questions are as follows:

1. Do significant differences exist in physician burnout scores within various demographic categories?
2. Do significant differences exist with physician overall satisfaction with the electronic health record components within various physician demographic categories?
3. Is there a significant relationship between physician burnout, satisfaction with the electronic health record, and the electronic health record’s perceived effect on patient care?
4. What are the key elements identified as strengths and weaknesses of the electronic health record?

**Significance of Study**

Within the realm of healthcare leadership, little research exists which examines the relationship between Family Medicine physician burnout and the electronic health record. As burnout has a proven effect on physician turnover rates, quality of care, and profitability (Lee et al. 2013; Willard-Grace et al. 2014), it is incumbent upon healthcare leaders to understand physician burnout. Most important, healthcare leaders should understand the causes, effects, and potential ways to mitigate burnout.

This study contributes to the body of research focusing on physician burnout in two main ways. First, a major strength of this study is the utilization of a fully developed and vetted inventory to assess burnout in physicians. A major component of the survey is the Copenhagen Burnout Inventory, which measures three distinct areas of burnout: work, personal, and client-related burnout. Schwenk and Gold (2018) suggested a major issue with most physician burnout research is a lack of utilization of a full burnout inventory. Rather, in most physician burnout research very abbreviated versions of established burnout inventories are used, causing questionable results.

Second, while utilizing an inventory to assess physician burnout, this study also simultaneously gathers data concerning physicians’ perceptions of the electronic health record. This data, along with the data gathered from the inventory, are analyzed to determine whether relationships exist between physicians’ perceptions of the electronic health record and physician burnout.
Limitations

The participants in this study are Family Medicine physicians from one state in the Upper South. Given that this study was conducted in only one state, there is limited applicability. It is possible attributes leading to or mitigating physician burnout are impacted by one’s geographical setting. As this study was conducted in only one state, the study is therefore limited, as one state cannot provide an accurate illustration of physician burnout for the whole country.

Further, this study is focused on only one specialty, Family Medicine. Each specialty of medicine has its own workflows, intricacies, and stresses. Therefore, it does not have the wide applicability to all specialties because it focuses only on Family Medicine physicians. Rather, it suggests further research in other specialties is needed.

Definitions

The following terms are mentioned throughout this study. The researcher believes these terms, due to their frequent use, need to be formally addressed and defined.

Burnout

Burnout has been defined differently by various experts. The variation in definitions, according to Schaufeli, Leiter, and Maslach (2009), because to the meaning of burnout has changed based on the context and perspective of the term. Within the study of burnout, there are two widely known definitions. Kristensen defined burnout as “the degree of physical and psychological fatigue and exhaustion experienced by the person” (Shaughnessy & Moore, 2010, p. 415). Maslach and Jackson (1981) defined burnout as “a syndrome of emotional exhaustion and cynicism that occurs frequently among individuals who do ‘people work’ of some kind” (p.99). While the definitions
vary, there is similarity among the two. Namely, burnout involves psychological exhaustion.

**Electronic Health Record**

The actual definition, depending on who is describing electronic health record (EHR) software, is somewhat ambiguous (Hayrinen, Saranto, & Nykanen, 2007). The following definition is offered by healthit.gov:

While an EHR does contain the medical and treatment histories of patients, an EHR system is built to go beyond standard clinical data collected in a provider’s office and can be inclusive of a broader view of a patient’s care. EHRs can contain a patient’s medical history, diagnoses, medications, treatment plans, immunization dates, allergies, radiology images, and laboratory and test results and allow access to evidence-based tools that providers can use to make decisions about a patient’s care (“What are the advantages,” 2018)

Hayrinen et al. (2007) described an electronic health record as a “repository of patient data in digital form, stored and exchanged securely, and accessibly by multiple authorized users. It contains retrospective, concurrent, and prospective information and its primary purpose is to support continuing, efficient and quality integrated healthcare” (p. 203).

While varying electronic health record platforms may offer different degrees of functionality, many share a few commonalities. One is that all electronic health record platforms are software that allow for health information to be accessed. Second, all electronic health record platforms act as a conduit for healthcare delivery via medication
prescribing, diagnostic ordering, etc. Finally, all platforms are continuous, meaning information entered often is recallable.

**Chapter Summary**

The details described in this chapter indicate an issue in healthcare that is in need of dire addressing: understanding electronic health record related burnout upon physicians. The lack of current research in this field indicates this is an area that needs to be further explored, especially in the field of Family Medicine. Family Medicine physicians, by virtue of their specialty, handle the brunt of primary care medicine in the US. Primary care physicians act as the gatekeeper into the healthcare system for a patient, making referrals to higher levels of care, etc. Primary care physicians who are burned out have significant implications for the entire healthcare ecosystem.

Chapter II describes the research on which this study is predicated. Chapter III details the mechanics and methods of the study. Chapter IV provides an analysis of research findings and, Chapter V details implications gleaned from the analysis of the data.
CHAPTER II: LITERATURE REVIEW

Introduction

At some point, nearly everyone experiences a disassociation between themselves and their work. Feelings of burnout often present in varying degrees in individuals (Freudenberger, 1974). Within a short period of time, curiosity surrounding burnout has evolved from a simple idea into a condition that is known around the world. Research has grown substantially as well. The phenomenon has increased from scant research in the mid-1970s with well over 6,000 publications currently dedicated to the subject (Schaufeli et al., 2009).

This literature review has a wide focus. A concise and succinct view of both burnout from a general perspective and from the aspect of the physician is discussed in this chapter. Furthermore, this literature review reports the consequences and possible avenues to mitigate burnout effects. Aspects of the electronic health record also are reviewed, including research and opinions that draw a relationship between physician burnout and the electronic health record.

Burnout

Burnout is a phenomenon that has been studied since at least the mid-1970s. During that time, two researchers simultaneously began to explore the issue (Maslach, Schaufeli, & Leiter, 2001). Freundenberger (1974), a psychologist, discussed the feelings he and his colleagues began to experience after working with clients for some time. Maslach (1976) stumbled upon the term when she wrote about her work while studying workplace emotions. As time has progressed, the research and interests have also progressed. Today, burnout is extremely well established in psychological research and
transcends many countries and professional disciplines (Kristensen, Borritz, Villadsen, & Christensen, 2005).

Most research into burnout seems to agree with the existence of certain realms or domains of the condition. These domains are essential to the measurement of burnout as well. Maslach and Jackson (1981) argued burnout is a syndrome which expresses itself across three domains: emotional exhaustion, personal accomplishment, and depersonalization. These three domains represent the essence of the Maslach Burnout Inventory, which asks respondents questions central to understanding these three areas. The research of Kristensen et al. (2005) resulted in different proposed domains of burnout to be measured to more accurately understand a person’s degree of burnout within certain dimensions of one’s life. Those domains are personal burnout, work-related burnout, and client-related burnout. These three realms make up the Copenhagen Burnout Inventory, a rival inventory to the Maslach Burnout Inventory.

Within the research of burnout inventories, there is somewhat of a debate of which inventory is better at ascertaining burnout: the Maslach Burnout Inventory or the Copenhagen Burnout Inventory (Kristensen et al., 2005; Schaufeli & Tarris, 2005). Perhaps, this disagreement can be attributed to vagueness of that which burnout truly is and also a wide-ranging definition of the term. Fuedenberger (1974) described burnout as a feeling of exhaustion caused by excessive demands usually foreshadowed by a feeling of disappointment in work or loss of satisfaction with one’s leader. Shirom (1989) defined burnout as “Combination of physical fatigue, emotional exhaustion and cognitive wariness” (p.33). Schaufeli and Greenglass (2001) go to defined burnout as “a state of physical, emotional and mental exhaustion that results from long-term involvement in
work situations that are emotionally demanding” (p. 501). Maslach and Leiter (1997) further stated burnout is simply a loss of excitement with the job. In one meta-analysis, researchers identified over 140 unique definitions of burnout and called for a consistent definition to be used (Rotenstein et al. 2018).

As it appears, several definitions of burnout seem to overlap. Many have some similar themes, as there is nearly always a point made about emotional exhaustion or fatigue. The overlap in the competing definitions of burnout, in essence, seems to create an area for debate as to which inventory is more accurate at measuring burnout.

Research has suggested certain situational factors may facilitate burnout. Specific job attributes may actually be a catalyst. Those factors may range from excessive work duties, lack of support with coworkers and leadership and a lack of feedback (Maslach et al., 2001). Not just situational aspects of one’s job may cause or contribute to burnout. Additionally, research has suggested two main characteristics of one’s work or job that may contribute to burnout. Those attributes are occupational characteristics (such as physician or environmental demands of a job) and organizational characteristics (such as company culture) (Maslach et al., 2001). The suggestion has been made that careers where employees work in teaching or caregiving roles may be associated with higher rates of burnout when compared to occupations that do not have a high level of interaction with others. Moreover, it seems the culture of an organization is extremely important in predisposing an employee to burnout.

Currently, there is some discussion within certain research circles to expand burnout research by developing new frameworks that are more exclusive of certain individual and situational factors (Maslach et al., 2001). This will certainly aid in the
understanding of burnout, as not all inventories currently available are able to measure individual or situational factors independently.

The future of burnout research is progressing and becoming more of a global focus. For example, research by Schaufeli et al. (2000) suggested interest in burnout seems to follow economic prosperity in countries. Those that experience economic growth tend to focus on areas specific to employment, such as recruitment and retention of their employees. These areas become a major focus and point of investment in an organization’s competitive edge. Research in the area of burnout will continue to grow as the focus shifts to organizational culture, employee engagement, and satisfaction.

**Physician Burnout**

Maslach and Jackson (1981) stated: “Burnout is a syndrome of emotional exhaustion and cynicism that occurs frequently among individuals who do ‘people work’ of some kind” (p. 99). By this definition and because of the nature of the work a physician performs on a routine basis, which is quintessential “people work,” he or she is more likely to experience burnout than many other professions. It is not solely the physician’s work with people that predispositions physicians to burnout, however. Gazelle, Liebschutz, and Riess (2014) listed numerous reasons for physician burnout, including the growing external pressures of today’s healthcare environment, as well as internal traits most physicians possess of perfection, compulsiveness, self-denial, guilt, denial of personal gratification, and denial of personal vulnerability.

There is research to suggest burnout begins to manifest itself before a physician is out practicing on his or her own. Dyrbye et al. (2018) suggested physicians in training (residents) share many similar burnout characteristics of practicing physicians in many
specialties. This finding has called some to investigate ways to mitigate burnout as early in a physician’s career as possible. The Accreditation Council for Graduate Medical Education (ACGME), which is the accrediting body of physician residency programs in the US, has begun to mandate implementation of physician wellness and mindfulness measures in training curricula as a means to address physician burnout early in physicians’ careers.

Recently, physician burnout has become a pressing concern to many in healthcare. According to Shanafelt, Hansan, et al. (2015), physicians reporting at least one symptom of burnout grew by 8.9% between the years 2011 to 2014, rising from 45.5% to 54.4%, respectively. This rapid growth in three years has alarmed many, including physicians, health administrators, policymakers, and patients. Physician burnout, however, has not received this much attention historically. Consider the quote from Epstein and Privitera (2016):

> When burnout was seen as a crisis of wellbeing—affecting physicians’ personal lives and work satisfaction—it garnered little public sympathy and could be dismissed as the whining of a privileged class. Now that evidence suggests that burnout negatively affects physicians’ effectiveness and availability to patients, as well as patient safety, physicians, healthcare organizations, and the public are justifiably worried about quality of patient care and the health of healthcare institutions. (p. 2216)

Physician burnout has now been attributed to medical errors, poor communication, lower patient satisfaction, and decreased quality of care (Spickard, Gabbe, & Christensen 2002, Willard-Grace et al., 2014). In today’s climate of insurance
companies, Medicare/Medicaid bundled remittances to hospitals and physicians for services, with the latter penalizing hospitals and physicians for poor quality of care delivered to patients, issues affecting quality of care are becoming a paramount concern for the healthcare industry as a whole.

Another effect of physician burnout gaining much attention is associated costs. Lee et al. (2013) and Gazelle et al. (2014) cited a close relationship between physician retention and burnout. Spickard et al. (2002) stated replacing a Family Medicine physician costs an organization $236,383. Adjusted for inflation, in 2018 that total cost was $330,762.66. As healthcare has evolved to become more competitive in a market where costs are rising, patients become more selective about where they seek care; and ever changing, more complex reimbursement policies that allow more for penalties, healthcare organizations are forced to adapt to strategies where physician retention is a central focus.

There has been speculation among some scholars concerning the reasons for the rise of physician burnout rates over recent years. Shanafelt et al. (2016) suggested the proliferation of technology into the clinic and hospital workspace could be to blame for the growing burnout rates. “Many physicians have speculated that the more widespread penetration of electronic health records, electronic prescribing, electronic patient portals, and computerized physician order entry may lead to information overload, frequent interruptions/distractions, and a change in the content of professional work” (p. 836). It is difficult today to envision a trip to the doctor or any healthcare facility without interfacing with some sort of technology. As innovations have occurred in medicine, as well as other professions, these sectors of the economy have become more
technologically advanced. Surgeons are now able to use robotic aids in surgery, prescribing information is now available as an application for mobile phones, and physicians can complete the task of documenting in the patient’s medical record from anywhere via an internet portal. Some are now beginning to ask the question: Are all these conveniences in medicine coming at a cost to our workforce?

While this technology was developed to innovate medicine, provide better outcomes for patients, and provide a seamless transition of care, there are now questions of how much of this technology is responsible for the wave of burnout being experienced by physicians. As technology has allowed for many conveniences of caring for patients at all hours, physicians’ personal time at home has become somewhat compromised. A job which, historically, could be left at the office is now able to be brought home, brought to children’s basketball games and dance recitals, and family gatherings in the form of a smart phone.

**Organizational Importance of Burnout**

Today’s organizational culture may be to blame for burnout of employees. Maslach et al. (2001) explained that today employees are expected to give more of their time, skills, and effort to their job and receive less in terms of employment security and advancement than in previous years. These trends may potentially exacerbate employee burnout to some degree.

Further, Schaufeli et al. (2009) added there are two reasons today’s employees are more prone to burnout: persistent imbalance of demands over resources and a skeptical view of organizational mission, values, and vision. Today, employees are constantly asked to do more with less, typically meaning doing more with less resources. Also, the
culture of employment seems to have changed over the years. Today, employees tend to align with organizations that reflect their own values. Organizations that do not align with an employee’s values may create acceptance issues on behalf of the employee, which may result in employee burnout.

An employee’s productivity also is affected when afflicted with burnout. Maslach and Jackson (1981) and Maslach et al. (2001) argued burnout is comprised of three domains—overwhelming exhaustion, detachment from the job, and feelings of ineffectiveness. From an exhaustion perspective, employees who experience excessive tiredness are much more likely to pull away from those associated with their job, such as coworkers (Halbesleben & Rathert, 2008). Ultimately, these employees suffer from a lack of team cohesiveness due to detachment with coworkers when they (the employee) experience burnout.

When an employee becomes disengaged with his or her work, he or she will be less likely to take initiative in new creative tasks, more likely to utilize sick time, and more likely give less efforts at work. When this occurs, the organization will be negatively affected. By employees utilizing sick time, the organization is paying for non-productive time, which costs the organization that also suffers as a result of employees not taking extra initiative at their job. When an employee fails in being creative with their work and giving extra effort, an organization’s innovative curve is negatively affected.

**Physician Burnout Consequences**

The impact of burnout on physician is consequential. Studies have shown a mere one-point difference in a physician’s burnout score produces significant variations in total hours worked, self-perceived medical errors, and suicidal intent (West et al. 2016). The
consequences of burnout are of importance to not only physicians, but also to patients and healthcare systems alike. There is a great deal of literature that points to drawbacks and negative consequences of burnout not only to physicians themselves, but also to patients and healthcare organizations. Shanafelt, Gorringe, et al. (2015) stated:

Extensive research now indicates that the well-being and professional satisfaction of physicians has a profound effect on the quality of care that physicians provide and affects patient’s adherence with treatment recommendations and satisfaction with medical care. These effects on quality of care, combined with the impact of satisfaction and burnout on turnover associated costs, underscore the critical importance of physician satisfaction and burnout to the long-term success of healthcare organizations. This fact has led to greater recognition that reducing burnout and cultivating resilience/career satisfaction are shared responsibilities of physicians and the organizations in which they function. (p. 436)

West, Dyrbye and Shanafelt (2018) suggested a triad model to understand the consequences of physician burnout. The three areas affected by burnout are Patient care (lower care quality, medical errors, longer recovery times, lower patient satisfaction); Healthcare system (reduced physician productivity, increased physician turnover, less patient care, increased cost); and Physician health (substance abuse, depression/suicidal ideation, poor self-care, motor vehicle crashes) (p. 518).

Deckard, Meterko, and Field (1994) were some of the earliest researchers to suggest burnout impacts the quality of care physicians provide. Deckard et al. (1994) focused on the impact of burnout on the physician’s mood as the determining factor in patient errors. This focus was originally proposed by Freundenberger (1974), who
suggested in his research that individuals experiencing burnout are more prone to emotional swings. Physicians who are irritable can cause implications for patient care in numerous ways. Hospital staff may be reluctant to communicate with them about important patient care related issues, patients may find their attitude abrasive and avoid seeking their services, and leadership position offers may be avoided because of a lack of collegial attitudes.

However, emotional mood swings are not the only consequence of burnout found in physicians. Halbesleben and Rathert (2008) proposed utilizing the Conservation of Theory model to understand physician burnout and its possible effects. Essentially, the model states the processes of motivation are affected once one reaches burnout. Today’s healthcare environment offers many opportunities for physician leadership and, in many cases, physician leadership is necessary (e.g., residency program directorships, medical directorship, and department chiefs in hospitals). Physicians who are experiencing burnout, however, are less likely to accept those leadership positions. Possible lack of physician leadership can affect decision making of an organization adversely, jeopardize patient safety, and/or have significant financial ramifications for health organizations.

Within recent decades, there has been a tremendous focus and emphasis on the quality of healthcare delivered to patients. As a result of this emphasis on quality, many have begun to research and identify certain dimensions that have a consequential effect on healthcare quality. One of those areas that has been identified as having a consequential effect on healthcare quality is physician burnout. Willard-Grace et al. (2014) identified a long list of areas where physician burnout can be detrimental to patient care and quality, including poor communication with patients, lower patient
satisfaction scores, poor patient recovery time following procedures, and increased medical errors. Research conducted by Halbesleben and Rathert (2008) confirmed the link between physician burnout and longer recovery time of patients, as well as poor patient satisfaction. Deckard et al. (1994) and Shanafelt, Hasan, et al. (2015) also acknowledged a definitive link between burnout and the quality of care delivered by the physician. Chopra, Sotile, and Sotile (2004) suggested burned out physicians are likely to work less hours. The reduction in work hours not only affects patients (as the physician is less likely to devote ample time to care for a large patient base), but also reduction in working hours affects a healthcare organization’s overall bottom line.

Physician burnout and its effects on patient communication was examined in greater detail by Ratanawongsa et al. (2008). Their research solidified the possible link between communication and patient satisfaction. Communication is a means of rapport building with patients. Physicians who are experiencing burnout may not be as effective in communication and, as a result, the physician-patient relationship may not be conducive for rapport building (Ratanawongsa et al., 2008). As a result of this, patient satisfaction metrics may be directly affected.

For healthcare organizations, physician burnout poses significant ramifications. Burnout has been linked to higher turnover, increased absenteeism, negative attitudes, and poor performance (Babyar, 2017). The associated effects of physician burnout on healthcare organizations carries significant quality implications. Those implications have the potential to significantly impact an organization’s overall operating margin in a climate, such as today’s environment, where healthcare payors begin to move to a pay-for-performance model.
A physician who is experiencing burnout is disengaged in many aspects. One of the costliest areas this disengagement can occur is in patient quality and safety. The inherent nature of a physician’s work (intervening in patient lives on a daily basis) results in their mistakes being much graver than those made in other industries where lives are not at risk. For this reason, it becomes clear why physician burnout is such a significant issue in today’s healthcare environment.

Last, physician suicide is of great issue of importance when examining the negative consequences associated with burnout. Research has suggested physicians experience suicide at a rate that is unparalleled by any other profession. Moreover, Schernhammer (2005) indicated the combined results of over 24 studies showed suicide among physicians is 40% greater in male physicians than the general male population and 130% higher in female physicians compared to females in the general public. These stark numbers by themselves are alarming. The possibility that burnout may have a relationship with physician suicide is more of a reason to explore the issue in more depth.

Research concerning the impact of physician burnout, as stated previously, is growing. However, the healthcare industry as a whole has had little interest in attributing the consequences of physician burnout to areas other than patient satisfaction (Halbesleben & Rathert, 2008). Healthcare is evolving to become much more patient-centric in its approach to satisfaction; but as research into the other areas of physician burnout consequences expands, so will the healthcare industry’s interest in the phenomenon.
Mitigating Burnout

There is no doubt a wealth of documented research and literature concerning burnout exists. However, literature and research on how to address the issue is lacking. West et al. (2016) suggested there is not one specific intervention which has proven to be better than any others in combating physician burnout. Given the effects that organizations can experience when physicians suffer burnout, it seems incumbent organizations to offer pathways to mitigate burnout. However, they are still slow to offer support for general employees who are experiencing burnout, much less physicians.

The most commonly prescribed method to reduce physician burnout is a strategy of employing mindfulness, stress management, and small group discussions (West et al., 2016). While this strategy of mechanisms seems to be the most commonly employed, emerging discussion and research suggest there are various other conduits for lessening physician burnout.

According to Suner-Soler, Grau-Martin, Flichtentrei, Prats, Braga, Font-Mayolas and Gras (2014), new coping, team culture, and role clarification strategies are emerging as possible avenues to mitigate burnout; however due to limited evidence of these interventions, their validity cannot be supported at this time. As the interest in burnout continues to increase, there is reasonable belief that more interventions to lessen the feelings of burnout will begin to appear in the literature.

Another emerging avenue to lessen the feelings of burnout in physicians could originate with professional coaching. Many organizations currently use coaching techniques in some capacity. Further, use of coaching services for professional development is an increasing trend. Gazelle et al. (2014) suggested “coaching increases
self-efficacy and self-determination, vital counterbalances to burnout” (p. 509). Coaching can improve resilience by enhancing a physician’s self-reflection and self-awareness (Gazelle et al., 2014). Building physician resilience could be a missing key in transforming the current context of burnout.

Resilience is an important factor when considering physician wellness, stress, and burnout. Resilience programs have been shown to improve a physician’s outlook on their work and working conditions despite the conditions (Zwack & Schweitzer, 2013). Jensen, Trollope-Kumar, Waters, and Everson (2008) suggested four main components of physician resilience: attitudes, ability to set personal limits and goals, practice management style, and personal relationships. These factors should be considered when implementing physician resilience programs within healthcare organizations.

Shanafelt et al. (2016) discussed the use of advanced care team models to reduce physician burnout. The team model approach utilizes qualified health professionals such as nurses and medical assistants for message management within the electronic health record, health coaching, care coordination, and other tasks in the clinic and hospital setting. Utilizing the team approach transitions ownership of some patient care tasks from the physician to others, resulting in a more manageable caseload for the physician. This advanced care model is already seen in some hospitals and clinics in the form of interdisciplinary rounds made on patient floors. In these rounds, a physician, advanced practice clinician, social worker, dietitian, pharmacist, and in some cases others, round on patients to ensure all aspects of their care are being met. This model alleviates some of the pressure from the physician, thus mitigating some risk of burnout.
The literature also has suggested using scribes, who are trained health professionals who enter data in the electronic health record on behalf of a physician, which can help reduce the electronic health record burden and improve physician satisfaction. The overall result is possible lower burnout rates (Gidwani et al., 2017).

Team structure also can improve feelings of burnout in physicians. In research conducted by Willard-Grace et al. (2014), it was found that a close-knit team structure, as well as steps to foster and promote team culture left, physicians less exhausted, contributing to less feelings of burnout.

While there seems to be some possible ways to mitigate burnout at the organizational level, some are advocating for physicians to take personal steps to alleviate burnout. Drummond (2015) suggested a two-prong approach physicians can take to lessen the feelings of burnout. First, physicians should take steps to lessen their stress levels and become aware of the drain the stress produces on their lives. Second, physicians must take part in activities that recharge themselves. Personal activities, such as spending time with family and friends and time away from the hospital and/or clinic, provide opportunities for physicians to relax and practice mindfulness. Mindfulness has been substantiated in the research of West et al. (2016) as a possible way to mitigate burnout.

Recently, the American Medical Association (AMA) proposed a program to prevent physician burnout. In the program entitled Steps Forward, the AMA lists seven steps to prevent burnout (Linzer, Guzman-Corrales, & Poplau, 2017):

1. Establish wellness as a quality indicator for your practice;
2. Start a wellness committee and/or choose a wellness champion;
3. Distribute an annual wellness survey;
4. Meet regularly with leaders and/or staff to discuss data and interventions to promote wellness;
5. Initiate selected interventions;
6. Repeat the survey within the year to re-evaluate wellness; and
7. Seek answers within the data, refine the interventions, and continue to make improvements. (p. 4)

It is important to note that an absolute prevention of burnout is not suggested in the literature. This is likely due to constant changing environments both with individuals and in their workplace. At some point, there will be emotions manifested as burnout, such as stress. Preventing stressful situations, especially in an area such as healthcare, is and will continue to be extremely difficult. As techniques, interventions, and strategies become more advanced, hopefully the effects of physician burnout also will become less in both experience and outcomes, translating to optimal physician wellness and better quality of care for patients.

Electronic Health Record

Electronic health record software has been in existence for decades in some form. Early versions of the software included abilities to view laboratory reports, medications, and other aspects of patient healthcare records. However, in 2009 the Health Information Technology for Economic and Clinical Health (HITECH) Act was responsible for pushing electronic health records into prominence in today’s healthcare environment. HITECH, which was written into the American Recovery and Investment Act, not only mandated electronic health records be used by healthcare professionals, but also those
professionals had to prove they were using the electronic health record in a meaningful way, which was attributed to factors such as cost containment and error reduction (Menachemi and Collum, 2011).

Early research into the implementation of electronic health records foreshadowed some unique physician stresses. Specifically, Zandieh, et al. (2008) indicated some barriers to successful electronic health record implementation. Their research suggested some physicians struggle with the extent of IT support needed. Also, physicians struggle with developing new typing skills, improving their comfort level with IT, and resistance to changing workflows in the clinic environment (Zandieh et al., 2008). In retrospect, this research highlighted problems still seen in the clinic environment today, some 11 years later. Specifically, there still seems to be a struggle within many healthcare systems regarding the amount of information technology support needed to support physicians. This is a high cost area for many healthcare organizations and is subjected to constant review.

Literature addressing physician burnout, physician stress, and the electronic health record is limited. However, some have alluded the electronic health record adds to physician stress. Research conducted by Babbot et al. (2014) yielded two important points: (1) Physicians who utilize a health record with a high functionality reported less job satisfaction and more stress; and (2) physicians utilizing an electronic health record with a high functionality reported negative outcomes, in part due to time pressure during physical examinations. Essentially, the more functions required by the software results in more areas the physician has to engage while interacting with the patient.
Clerical task requirements of the electronic health record can contribute to physician stress. Shanafelt et al. (2016) suggested electronic health record software, in part, forced clerical positions such as transcriptionists out of the health clinic; actually, many electronic health record systems have been funded by eliminating transcription services in many health clinics.

With the removal of transcriptionists, physicians now must dictate using voice recognition software or self-enter data. Further, the more interaction in the exam room with a computer rather than the patient is causing stress among physicians (Shanafelt et al., 2016). This often is a complaint of patients—the physician looking at the computer screen more than the patient. Medicine is deeply personal work. Interacting with patients is the acme of the profession. When that interaction is disrupted, the profession changes.

A correlation can be drawn between burnout and the rise of the electronic health record. In 2016, the U.S. government issued a report illustrating the adoption of the electronic health record over the last eight years. Implementation of a basic electronic health record, which is used as the standard measuring metric of electronic health records (basic electronic health records have functions such as viewing images, lab results, and patient notes) rose from 27.6% in 2011 to 75.5% in 2014 among hospitals reporting information to the American Hospital Association (AHA) (Henry, Pylypchuk, Searcy, & Patel, 2016). During that same time frame, from 2011 to 2014, a survey of physicians reporting at least one symptom of burnout rose from 45.5% reporting one symptom of burnout to 54.4% reporting at least one symptom of burnout (Shanafelt, Hansan, et al., 2015).
The reported physician burnout rise of nearly 9% during three years is seemingly unprecedented since figures have been maintained. The cause for this rise may be a symptom of the undesired consequences of technology adoption. However, further research is needed to investigate the relationship.

**Consequences of Technology**

Implementation of any sort of technology typically results in unanticipated consequences and undesired consequences (Harrison, Koppel & Bar-Lev, 2007). Unanticipated consequences are positive results; however, undesired consequences are generally negative results. One possible way of understanding the consequences of the implementation of new health technology rests with the interactive sociotechnical analysis developed by Harrison et al. (2007). A common misconception among health information technology, particularly, is that implementation issues can be solved simply by implementing more or better technology. However, that is not necessarily the case.

Research has suggested various other factors actually depend on the success of technology that is implemented, not only the technology itself. Harrison, et al. (2007) suggested five interaction types that cause conflict with health information technology implementation:

1. New HIT changes existing social structure.
2. Technological & physical infrastructures mediate HIT use; interaction of new HIT with existing technical and physical conditions affects HIT-in-use.
3. Social system medicates HIT use; interaction of new HIT with the social system affects HIT-in-use.
4. HIT-in-use changes social system; interaction of new HIT with the social system affects HIT-in-use, which then changes the social system.

5. HIT-social system interactions endanger HIT redesign; interaction of new HIT with the social system affects HIT-in-use; then leads to change in HIT properties. (p. 544)

The social aspect of the culture explains much of the success of new health information technology implementation. The research by Harrison et al. is especially telling of this point. However, there is very limited research in this area of health information technology. More research is warranted to more closely investigate the issues of health information technology implementation.

**Chapter Summary**

Within this literature review, a concise yet detailed view of burnout has been discussed. Burnout related specifically to physicians has been discussed and explored. Details concerning consequences and possible avenues to mitigate burnout also have been detailed, along with the potential linkage of physician burnout to technology. This literature review sets the foundation upon which the study of exploring physician burnout and the possible linkage of the electronic health record to physician burnout is based. In the next chapter, the study methodology is discussed in detail.
CHAPTER III: METHODOLOGY

Introduction

The purpose of this study was to better understand the potential relationship between the electronic health record and physician burnout. The study also examined demographics of physicians to determine whether if any relationship exists between aspects of the electronic health record and burnout in relation to population characteristics. This chapter explains the research questions and study design of the research project.

The data gathered from this study provide insights to healthcare leaders and administrators on the issue of physician burnout, specifically burnout experienced by physicians and the potential relationship with the electronic health record. As the literature review suggests, physician burnout has significant implications and consequences for healthcare. For these reasons, healthcare professionals should build awareness of the factors contributing to burnout. Physicians, healthcare administrators, and information technology professionals are just a few key stakeholders who can build an awareness of the issue which hopefully will translate into positive change.

In the previous chapter, a thorough literature review was presented which covered a wide spectrum of professional burnout. As was implied, the negative impact of burnout has the potential to increase costs for healthcare organizations, increase physician turnover rates, and endanger patient lives. These reasons are the underlying rationale for the importance of studying physician burnout and underscore the researcher’s rationale for interest in the topic.
Currently, there is no clear understanding of the relationship between the electronic health record and physician burnout. Accordingly, this dearth of knowledge underlines the need for research exploring this relationship. As the awareness in this particular area of healthcare increases, potential solutions can be sought to mitigate the effects.

**Research Questions**

This study was guided by an overall research question: Is there a relationship between physicians’ attitude with the electronic health record and burnout measured by the Copenhagen Burnout Inventory? However, to answer that question, a four-question research subset was devised by this researcher. The intent of the subset was to explore the potential relationship between the electronic health record and physician burnout, which also answers the overall research question of this study. The four-question subset is described below:

1. Do significant differences exist in physician burnout scores within various demographic categories?
2. Do significant differences exist with physician overall satisfaction with the electronic health record components within various physician demographic categories?
3. Is there a significant relationship between physician burnout, satisfaction with the electronic health record and the electronic health record’s perceived effect on patient care?
4. What are the key elements identified as strengths and weaknesses of the electronic health record?
Study Design

This study involved utilizing a survey designed by the researcher comprised of three basic categories: demographics, burnout, and the electronic health record. Questions addressing age, gender, years practicing, and type of practice of the respondents comprised the demographic section of the survey. Questions addressing electronic health record perceptions also were devised by the researcher. Questions measuring burnout, however, were sought from an established inventory. The reason for seeking an established burnout inventory was mainly due to time constraints of developing and validating a novel instrument.

Most literature where burnout research has been conducted utilized the Maslach Burnout Inventory in some capacity (West et al., 2018). Kristensen et al. (2005) noted research conducted by Schaufeli and Enzemann in 1998 determined approximately 90% of all burnout research utilized the Maslach Burnout Inventory. A study completed by Rotenstein, et al. (2018) concluded nearly 86% of physician burnout research conducted utilized some version of the Maslach Burnout Inventory. Schaufeli et al. (2005) added that the Maslach Burnout Inventory is the gold standard to measure burnout. Given the dominance of the Maslach Burnout Inventory, it seems appropriate this research should utilize the same inventory as well. However, there were two issues identified within the study design that dissuaded use of the Maslach Burnout Inventory.

First, the developer of the Maslach Burnout Inventory, Dr. Christine Maslach, sold the rights of the inventory to a third party. For researchers who would like to utilize the inventory for academic research, a discount is given. Despite the discount, the researcher is still required to pay for the individual inventory. This quickly becomes cost
prohibitive when working on self-funded research and, thus, was not reasonable for this study.

Second, this study focused on the relationship between the electronic health record and physician burnout. The Maslach Burnout Inventory measures three components of burnout: emotional exhaustion, depersonalization, and reduced personal accomplishment. Those three areas, this researcher believes, are too vague when one looks for clear research takeaways from a study. To say there is a relationship between electronic health record satisfaction and depersonalization, for example, is an amorphous generalization. Therefore, another established inventory was sought that measures components of burnout to the relationship of the electronic health. After a thorough review of established burnout inventories, this researcher concluded the Copenhagen Burnout Inventory to be best suited for this study that examined physician burnout and the electronic health record.

The Copenhagen Burnout Inventory is the only established inventory which examines the three domains of personal, work, and client-related burnout by utilizing questions specific to each of those areas (Kristensen et al., 2005). From a research analysis perspective, it becomes clear to associate relationships between the three areas of burnout measured by the Copenhagen Burnout Inventory and aspects of the electronic health record measured in this study. Further, it was determined these three areas (personal burnout, work-related burnout and client-related burnout) accurately reflect dimensions of a physician’s daily work-life (as physicians interact with their work, personal matters and patients on a daily basis).
Unlike the Maslach Burnout Inventory, usage of the Copenhagen Burnout Inventory for research is free. The developer of the Copenhagen Burnout Inventory, Dr. Tage Kristensen, was quoted as saying (for his reasons of developing a rival burnout inventory to the Maslach Burnout Inventory), “We didn’t want to pay for the use of questionnaires in our research, and it’s against our principles to let other people pay for the use of our questionnaires, such as the CBI” (Shaughnessy & Moore, 2010, p. 416). Finally, it becomes much more clear and conclusive to attribute aspects of the electronic health record to the three domains of burnout the Copenhagen Burnout Inventory measures. Permission was sought and granted from the developer of Copenhagen Burnout Inventory to be used in this research. For the letter granting permission to use the Copenhagen Burnout Inventory for this research, please see Appendix A.

The authors of the Copenhagen Burnout Inventory (Kristensen et al., 2005) recommended, in order to avoid stereotyped responses, questions addressing each area of burnout should be presented in an assorted way. The final question order is reflected in the final questionnaire, which can be found in Appendix B. The questions surrounding the electronic health record portion of the survey were formulated through a two-step process which involved a literature review, as well as informal interviews of physicians and other healthcare workers. The preliminary questionnaire, before removal of items due to poor Inter-rater Kappa scores is, located in Table 1.
Table 1

Questionnaire Before Validity/Reliability Evaluation

1. What is your gender?
2. What is your age?
3. How many years have you been practicing?
4. Which of the following best describes your practice setting?
5. Is your work emotionally exhausting?
6. Do you feel burnt out because of your work?
7. Does your work frustrate you?
8. Do you find it hard to work with patients?
9. Do you find it frustrating to work with patients?
10. Does it drain your energy to work with patients?
11. Do you feel that you give more than you get back when you work with patients?
12. To what degree do you feel patient care is adversely affected by the amount of electronic health record documentation you must complete?
13. To what degree do you feel the electronic health record takes time away from patient care?
14. How often do you feel tired?
15. How often are you physically exhausted?
16. How often are you emotionally exhausted?
17. How often do you think: “I can’t take it anymore”?
18. How often do you feel worn out?
19. How often do you feel weak and susceptible to illness?
20. Do you feel worn out at the end of the working day?
21. Are you exhausted in the morning at the thought of another day at work?
22. Do you feel that every working hour is tiring for you?
23. Do you have enough energy for family and friends during leisure time?
24. Are you tired of working with patients?
25. Do you sometimes wonder how long you will be able to continue working with patients?
26. Your satisfaction with total time spent doing tasks in the electronic health record
27. Your satisfaction with speech/dictation capabilities
28. Your satisfaction with note templates
29. Your satisfaction with electronic prescribing
30. Your satisfaction with number of mouse clicks per patient encounter
31. Your satisfaction with ability to create a note
32. Your satisfaction with design layout of the screen
33. Overall satisfaction with the electronic health record process
34. Overall, how satisfied are you with the amount of support you receive to navigate the electronic health record?
35. Overall, how satisfied are you with the electronic health record platform you currently utilize?
36. What would you identify as the strengths of the electronic health record?
37. What would you identify as the weaknesses of the electronic health record?

*Questions in bold represent questions from the Copenhagen Burnout Inventory.*
After the questionnaire was developed, the survey was subjected to a content validity evaluation. Eight physicians, an advanced practice registered nurse, as well as a licensed clinical social worker evaluated the content relevance of each question. Those addressing participant demographics, as well as open-ended questions (question 36 and 37), were not subjected to the content validity evaluation, as they were simple open-ended questions seeking feedback. The results of the content validity evaluation are displayed in Table 2.
Table 2

Content Validity of Questionnaire

<table>
<thead>
<tr>
<th>Question</th>
<th>N</th>
<th>Ratings &gt; 3</th>
<th>Kappa</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Is your work emotionally exhausting? *</td>
<td>10</td>
<td>8</td>
<td>0.791</td>
</tr>
<tr>
<td>6. Do you feel burnt out because of your work? *</td>
<td>10</td>
<td>6</td>
<td>0.497</td>
</tr>
<tr>
<td>7. Does your work frustrate you? *</td>
<td>10</td>
<td>6</td>
<td>0.497</td>
</tr>
<tr>
<td>8. Do you find it hard to work with patients? **</td>
<td>10</td>
<td>5</td>
<td>0.337</td>
</tr>
<tr>
<td>9. Do you find it frustrating to work with patients? **</td>
<td>10</td>
<td>5</td>
<td>0.337</td>
</tr>
<tr>
<td>10. Does it drain your energy to work with patients? **</td>
<td>10</td>
<td>7</td>
<td>0.660</td>
</tr>
<tr>
<td>11. Do you feel that you give more than you get back when you work with patients? **</td>
<td>10</td>
<td>8</td>
<td>0.791</td>
</tr>
<tr>
<td>12. To what degree do you feel patient care is adversely affected by the amount of electronic health record documentation you must complete? †</td>
<td>10</td>
<td>9</td>
<td>0.899</td>
</tr>
<tr>
<td>13. To what degree do you feel the electronic health record takes time away from patient care? †</td>
<td>10</td>
<td>9</td>
<td>0.899</td>
</tr>
<tr>
<td>14. How often do you feel tired? ***</td>
<td>10</td>
<td>7</td>
<td>0.660</td>
</tr>
<tr>
<td>15. How often do you feel physically exhausted? ***</td>
<td>10</td>
<td>4</td>
<td>0.245</td>
</tr>
<tr>
<td>16. How often do you feel emotionally exhausted? ***</td>
<td>10</td>
<td>6</td>
<td>0.497</td>
</tr>
<tr>
<td>17. How often do you think: “I can’t take it” anymore? ***</td>
<td>10</td>
<td>6</td>
<td>0.497</td>
</tr>
<tr>
<td>18. How often do you feel worn out? ***</td>
<td>10</td>
<td>4</td>
<td>0.245</td>
</tr>
<tr>
<td>19. How often do you feel weak and susceptible to illness? ***</td>
<td>10</td>
<td>4</td>
<td>0.245</td>
</tr>
<tr>
<td>20. Do you feel worn out at the end of the working day? **</td>
<td>10</td>
<td>5</td>
<td>0.337</td>
</tr>
<tr>
<td>21. Are you exhausted in the morning at the thought of another day at work? *</td>
<td>10</td>
<td>6</td>
<td>0.497</td>
</tr>
<tr>
<td>22. Do you feel that every working hour is tiring for you? *</td>
<td>10</td>
<td>4</td>
<td>0.245</td>
</tr>
<tr>
<td>23. Do you have enough energy for family and friends during leisure time? *</td>
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</tr>
<tr>
<td>24. Are you tired of working with patients? **</td>
<td>10</td>
<td>5</td>
<td>0.337</td>
</tr>
<tr>
<td>25. Do you sometimes wonder how long you will be able to continue working with patients? **</td>
<td>10</td>
<td>6</td>
<td>0.497</td>
</tr>
<tr>
<td>26. Your satisfaction with total time doing tasks in the electronic health record †</td>
<td>10</td>
<td>7</td>
<td>0.660</td>
</tr>
<tr>
<td>27. Your satisfaction with speech/ dictation capabilities †</td>
<td>10</td>
<td>4</td>
<td>0.245</td>
</tr>
<tr>
<td>28. Your satisfaction with note templates †</td>
<td>10</td>
<td>4</td>
<td>0.245</td>
</tr>
</tbody>
</table>

(Continued)
29. Your satisfaction with electronic prescribing †  10  8  0.791
30. Your satisfaction with number of mouse clicks per patient encounter †  10  7  0.660
31. Your satisfaction with the ability to create a note †  10  9  0.899
32. Your satisfaction with the design layout of the screen †  10  7  0.660
33. Overall satisfaction with the electronic health record process †  10  7  0.660
34. Overall, how satisfied are you with the amount of support you receive to navigate the electronic health record? †  10  8  0.791
35. Overall, how satisfied are you with the electronic health record platform you currently utilize?  10  8  0.791

*Personal-related burnout questions.
** Client-related burnout questions.
*** Work-related burnout questions.
† Electronic health record-related questions developed by the researcher.
Questions that received an Inter-rater Kappa value of less than .3 were evaluated and removed from the questionnaire. However, this rule was problematic with those questions specific to the Copenhagen Burnout Inventory. Some questions from the Copenhagen Burnout Inventory received an Inter-rater Kappa of less than .3 in the content validity evaluation. However, the decision was made by this researcher to retain those questions as part of the survey. That decision was primarily predicated upon the fact that removing questions belonging to the Copenhagen Burnout Inventory would skew results in the final questionnaire. Removing the questions used to estimate burnout of specific domains in the Copenhagen Burnout Inventory would not match the inventory’s developer’s intentions and give an inaccurate measure of burnout. Following the content validity evaluation, questions 27 and 28 were removed due to poor Inter-rater Kappa scores.

Following the questionnaire’s content validity evaluation, its reliability was evaluated. Results of the test/retest evaluation are displayed in Table 3. Using a group of 16 physicians who did not participate in the content validity evaluation, the survey was administered twice over a two-week period, using a test/retest method to validate consistency of answers. For this phase of instrument testing, the researcher used an Inter-rater Kappa score of .20 or below to remove questions. For reference, Landis and Koch (1977) identified an inter-rater Kappa scores of .21 to .40 as “fair,” .00 to .20 as “slight,” and < .00 as “poor” (p. 165). Again, it was decided by the researcher to keep the questions from the Copenhagen Burnout Inventory in the final survey regardless of Inter-rater Kappa score.
As noted in the validity evaluation, removing questions from the Copenhagen Burnout Inventory would skew the results and alter the results of the burnout analysis. Those removed from the original questionnaire due to poor Inter-rater Kappa scores were questions 32 and 33 from the previous version of the instrument.
Table 3

Test/Retest of Multiple Choice Questions

<table>
<thead>
<tr>
<th>Question</th>
<th>No. Ratings</th>
<th>No. Exact Agreement</th>
<th>% Exact Agreement</th>
<th>Inter-rater Kappa Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Is your work emotionally exhausting? ***</td>
<td>16</td>
<td>8</td>
<td>50.0</td>
<td>0.301</td>
</tr>
<tr>
<td>6. Do you feel burnt out because of your work? ***</td>
<td>16</td>
<td>7</td>
<td>43.8</td>
<td>0.209</td>
</tr>
<tr>
<td>7. Does your work frustrate you? ***</td>
<td>16</td>
<td>7</td>
<td>43.8</td>
<td>0.186</td>
</tr>
<tr>
<td>8. Do you find it hard to work with patients? **</td>
<td>16</td>
<td>8</td>
<td>50.0</td>
<td>0.347</td>
</tr>
<tr>
<td>9. Do you find it frustrating to work with patients? **</td>
<td>16</td>
<td>10</td>
<td>62.5</td>
<td>0.458</td>
</tr>
<tr>
<td>10. Does it drain your energy to work with patients? **</td>
<td>16</td>
<td>13</td>
<td>81.3</td>
<td>0.709</td>
</tr>
<tr>
<td>11. Do you feel that you give more than you get back with patients? **</td>
<td>16</td>
<td>12</td>
<td>75.0</td>
<td>0.656</td>
</tr>
<tr>
<td>12. To what degree do you feel patient care is adversely affected by the amount of electronic health record documentation you must complete? †</td>
<td>16</td>
<td>11</td>
<td>68.8</td>
<td>0.592</td>
</tr>
<tr>
<td>13. To what degree do you feel the electronic health record takes time away from patient care? †</td>
<td>16</td>
<td>9</td>
<td>56.3</td>
<td>0.411</td>
</tr>
<tr>
<td>14. How often do you feel tired? *</td>
<td>16</td>
<td>12</td>
<td>75.0</td>
<td>0.579</td>
</tr>
<tr>
<td>15. How often are you physically exhausted? *</td>
<td>16</td>
<td>7</td>
<td>43.8</td>
<td>0.234</td>
</tr>
<tr>
<td>16. How often do you feel emotionally exhausted? *</td>
<td>16</td>
<td>13</td>
<td>81.3</td>
<td>0.727</td>
</tr>
<tr>
<td>17. How often do you think: “I can’t take it anymore”? *</td>
<td>16</td>
<td>11</td>
<td>68.8</td>
<td>0.477</td>
</tr>
<tr>
<td>18. How often do you feel worn out? *</td>
<td>16</td>
<td>12</td>
<td>75.0</td>
<td>0.636</td>
</tr>
<tr>
<td>19. How often do you feel weak and susceptible to illness? *</td>
<td>16</td>
<td>12</td>
<td>75.0</td>
<td>0.595</td>
</tr>
<tr>
<td>20. Do you feel worn out at the end of the working day? ***</td>
<td>16</td>
<td>8</td>
<td>50.0</td>
<td>0.251</td>
</tr>
<tr>
<td>21. Are you exhausted in the morning at the thought of another day at work? ***</td>
<td>16</td>
<td>9</td>
<td>56.3</td>
<td>0.360</td>
</tr>
<tr>
<td>22. Do you feel that every working hour is tiring for you? ***</td>
<td>16</td>
<td>9</td>
<td>56.3</td>
<td>0.378</td>
</tr>
<tr>
<td>23. Do you have enough energy for family and friends during leisure time? ***</td>
<td>16</td>
<td>12</td>
<td>75.0</td>
<td>0.610</td>
</tr>
<tr>
<td>24. Are you tired of working with patients? **</td>
<td>16</td>
<td>10</td>
<td>62.5</td>
<td>0.464</td>
</tr>
<tr>
<td>25. Do you sometimes wonder how long you will be able to continue working with patients? **</td>
<td>16</td>
<td>9</td>
<td>56.3</td>
<td>0.364</td>
</tr>
<tr>
<td>26. Total time spent doing tasks in the electronic health record †</td>
<td>16</td>
<td>10</td>
<td>62.5</td>
<td>0.551</td>
</tr>
<tr>
<td>27. Electronic prescribing †</td>
<td>16</td>
<td>8</td>
<td>50.0</td>
<td>0.418</td>
</tr>
<tr>
<td>28. Number of mouse clicks per patient †</td>
<td>16</td>
<td>7</td>
<td>43.8</td>
<td>0.354</td>
</tr>
</tbody>
</table>

(continued)
29. Ability to create a note †  &nbsp; 16 &nbsp; 7 &nbsp; 43.8 &nbsp; 0.330  
30. Design layout of the screen † &nbsp; 16 &nbsp; 2 &nbsp; 12.5 &nbsp; -0.014  
31. Overall satisfaction with the electronic health record process † &nbsp; 16 &nbsp; 1 &nbsp; 6.3 &nbsp; -0.062  
32. Overall, how satisfied are you with the amount of support you receive to navigate the electronic health record? † &nbsp; 16 &nbsp; 6 &nbsp; 37.5 &nbsp; 0.245  
33. Overall, how satisfied are you with the electronic health record platform you currently utilize? † &nbsp; 16 &nbsp; 8 &nbsp; 50.0 &nbsp; 0.431  

*Personal-related burnout questions.  
** Client-related burnout questions.  
*** Work-related burnout questions.  
† Electronic health record-related questions developed by the researcher.
Procedures

This research project, in its entirety, adheres to Western Kentucky University research protocols, as outlined by the University’s Institutional Review Board. The approval letter from the Institutional Review Board for this study can be found in Appendix C.

Study Participants

This study focused on ascertaining the impact of electronic health records on physician burnout. The Kentucky Academy of Family Physicians (KAFP) agreed to participate in this study by sending their practicing physician membership an email blast with a message and embedded web link to the survey. Table 4 includes statistics on both email blasts.

A copy of the email used to solicit participation for this research can be found in Appendix D. As per Institutional Review Board policies, the survey includes the permission letter indicating participation in the study was anonymous and voluntary.

Table 4

<table>
<thead>
<tr>
<th>Email Blast Statistics</th>
<th>Email 1</th>
<th>Email 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sent</td>
<td>745</td>
<td>739</td>
</tr>
<tr>
<td>Opened</td>
<td>268</td>
<td>233</td>
</tr>
<tr>
<td>Links Clicked</td>
<td>65</td>
<td>19</td>
</tr>
<tr>
<td>Unsubscribed</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Bounced</td>
<td>14</td>
<td>13</td>
</tr>
</tbody>
</table>
Data Analysis Methods and Tools

The KAFP was supplied with an introductory letter with an embedded link that took the participant to the survey. The survey was built and housed in Qualtrics, and sent twice to the membership over a two-week period. Results were placed in Microsoft Excel and analyzed using statistical software packages SAS and STATA. A copy of the invitation email can be seen in Appendix D.

Chapter Summary

This study investigated the potential relationship of the electronic health record with physician burnout. The literature review suggests a relationship between the electronic health record and physician burnout. This chapter outlined the study, including the formation of the research questions, study population, and survey delivery. Further, this chapter detailed the development of the survey utilized to investigate the potential relationship between the electronic health record and physician burnout. In the next chapter, the data yielded from the study are discussed and analyzed.
CHAPTER IV: RESULTS

Introduction

This study explored the potential relationship between physician burnout and the electronic health record. As the literature review suggests, there is a potential relationship between physician burnout and the electronic health record. The potential relationship, however, has been primarily based on anecdotal evidence. This study is the first known to use a fully developed burnout inventory to assess physician burnout in conjunction with specific questions directly related to electronic health record perceptions.

The survey, which is web-based, was administered via email to Family Medicine physician members of the KAFP. Two email invitations were sent to the membership soliciting participation. A total of 739 physicians comprised the population for this study; a total of 68 surveys were ultimately completed at the end of a four-week window. This translates to a 9.2% overall participation rate.

The instrument administered was comprised of three main categories: a demographics section, the Copenhagen Burnout Inventory, and questions related to perceptions of the electronic health record. The burnout inventory, as well as the majority of the electronic health record-related questions, utilized a Likert scale, with responses coded into numerical figures for statistical analysis.

Two questions accessed perceived effects of the electronic health record on patient care:

17. To what degree do you feel the electronic health record takes time away from patient care?
18. To what degree do you feel patient care is adversely affected by the amount of electronic health record documentation you must complete?

The responses of the two questions were scored on the following scale: to a very high degree (5 points), to a high degree (4 points), somewhat (3 points), to a low degree (2 points), and to a very low degree (1 point). At the conclusion, the scores were summed to provide an overall estimate of the respondents’ perception of the effects of electronic health record on patient care.

To gauge overall satisfaction with the electronic health record, six questions were included on the survey:

26. Total time spent doing tasks in the electronic health record
27. Electronic prescribing
28. Number of mouse clicks per patient encounter
29. Ability to create a note
30. Overall, how satisfied are you with the amount of support you receive to navigate the electronic health record?
31. Overall, how satisfied are you with the electronic health record platform you currently utilize?

The responses to these six questions utilized a continuous scoring scale of 1 through 10, where 1 reflected a very low satisfaction with the respective component and 10 reflected a very high satisfaction. Each component was summed to estimate satisfaction with the electronic health record. This estimate is known in the study as the respondents’ overall satisfaction score with the electronic health record. Appendix B contains a copy of the entire survey instrument.
Of the 68 physicians who participated, 42 were female (62.7%) and 26 were male (38.3%). The average age was 50.1, and average years of practicing was 20.1. Five categories of practice type were identified. Tables 5, 6, and 7 summarize the study respondent demographics.

Table 5

*Study Participants by Gender*

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>26</td>
<td>38.23</td>
</tr>
<tr>
<td>Female</td>
<td>42</td>
<td>62.76</td>
</tr>
<tr>
<td>Total</td>
<td>68</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Table 6

*Study Participants by Practice Type*

<table>
<thead>
<tr>
<th>Practice Type</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>4</td>
<td>5.80</td>
</tr>
<tr>
<td>Group (employed practice)</td>
<td>39</td>
<td>57.35</td>
</tr>
<tr>
<td>Group (private practice)</td>
<td>7</td>
<td>10.29</td>
</tr>
<tr>
<td>Solo practice</td>
<td>8</td>
<td>11.76</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
<td>14.70</td>
</tr>
<tr>
<td>Total</td>
<td>68</td>
<td>100.00</td>
</tr>
</tbody>
</table>
Table 7

*Respondent Mean Age and Mean Years Practicing*

<table>
<thead>
<tr>
<th>Demographic</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>26</td>
<td>50.1</td>
<td>11.1</td>
</tr>
<tr>
<td>Years Practicing</td>
<td>42</td>
<td>20.1</td>
<td>12.1</td>
</tr>
</tbody>
</table>

**Research Questions**

The overall research question guiding this study was: Is there a relationship between the physician’s attitude with electronic health record and burnout measured by the Copenhagen Burnout Inventory? To address this overall research question, four succinct research question subsets were formulated.

**Research Question 1**

Research Question 1: *Do significant differences exist in physician burnout scores within various demographic categories?* The demographics examined in the study included gender, years practicing, and practice type.

The Copenhagen Burnout Inventory, which was used for this study, measures burnout in three subscales: (1) Personal Burnout, (2) Work-Related Burnout, and (3) Client-Related Burnout. To arrive at each of the three subscale scores, items within the subscales were summed. The Copenhagen Burnout Inventory utilizes a Likert rating scale for all questions. For classification purposes, the Copenhagen Burnout Inventory places respondents into four categories for each of the three burnout subscales:

1. No signs of burnout
2. Some things you should be aware of
3. Exhibiting some signs of burnout
4. Needing to seek help or other interventions

An actual score classification for each of the three scales is summarized in Table 8.

8. For the actual scoring table translated into English, please see Appendix E.

Table 8

*Copenhagen Burnout Inventory and Scale Scoring and Recommendations by Scale*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Scale Score</th>
<th>Scale Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Burnout</td>
<td>0-5</td>
<td>You have no signs of burnout</td>
</tr>
<tr>
<td></td>
<td>6-11</td>
<td>There are some things that you need to be aware of</td>
</tr>
<tr>
<td></td>
<td>12-17</td>
<td>You have some symptoms of burnout that you should be aware of</td>
</tr>
<tr>
<td></td>
<td>18+</td>
<td>You are so exhausted and burned out that you should immediately seek help to change your situation</td>
</tr>
<tr>
<td>Work-Related Burnout</td>
<td>0-6</td>
<td>You have no signs of burnout in relation to your work</td>
</tr>
<tr>
<td></td>
<td>7-13</td>
<td>There are some things that you need to be aware of in relation to your work</td>
</tr>
<tr>
<td></td>
<td>14-20</td>
<td>You have some symptoms of burnout that you should be aware of</td>
</tr>
<tr>
<td></td>
<td>21+</td>
<td>You are so exhausted and burned out that you should immediately seek help to change your work situation</td>
</tr>
<tr>
<td>Client-Related Burnout</td>
<td>0-5</td>
<td>You have no signs of burnout in relation to your work with clients</td>
</tr>
<tr>
<td></td>
<td>6-11</td>
<td>There are some things that you need to be aware of in relation to your work with clients</td>
</tr>
<tr>
<td></td>
<td>12-17</td>
<td>You have some symptoms of burnout that you should be aware of</td>
</tr>
<tr>
<td></td>
<td>18+</td>
<td>You are so exhausted and lost for energy working with clients that you should immediately apply help to change your situation</td>
</tr>
</tbody>
</table>

To examine whether if differences exist in burnout scores by demographic variables, *t*-test and analysis of variance (ANOVA) techniques were utilized. A *t*-test was performed on each of the three scales by responding gender. No significant differences were found. Table 9 summarizes the burnout scales by gender.
Table 9

*Copenhagen Burnout Inventory Subscale Mean Scores by Gender*

<table>
<thead>
<tr>
<th>Gender</th>
<th>Personal-Related</th>
<th>Work-Related</th>
<th>Client-Related</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Male</td>
<td>26</td>
<td>11.11</td>
<td>5.76</td>
</tr>
<tr>
<td>Female</td>
<td>42</td>
<td>12.52</td>
<td>4.13</td>
</tr>
</tbody>
</table>

To examine whether if differences exist by years practicing and practice type, an ANOVA was performed. In order to perform the ANOVA, years practicing was subjected to a frequency distribution that allowed the researcher to divide the distribution into three groups: new career (1-13 years practicing), mid-career (14-24 years practicing), and senior career (25 or more years practicing). These groups were divided into nearly equal categories. The ANOVA revealed no significant differences in any of the subscales of these classifications. Table 10 summarizes these results.

Table 10

*Copenhagen Burnout Inventory Subscale Mean Scores by Years Practicing*

<table>
<thead>
<tr>
<th>Years Practicing</th>
<th>Personal-Related</th>
<th>Work-Related</th>
<th>Client-Related</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>1-13 (New)</td>
<td>21</td>
<td>12.95</td>
<td>4.98</td>
</tr>
<tr>
<td>14-24 (Mid-career)</td>
<td>23</td>
<td>11.00</td>
<td>4.23</td>
</tr>
<tr>
<td>25+ (Senior)</td>
<td>24</td>
<td>12.08</td>
<td>5.23</td>
</tr>
</tbody>
</table>
To examine the differences by practice type, an ANOVA was performed. Due to the distributions of practices type being skewed toward the “group (employed) practice” category (see Table 6), a sample of nine respondents from this category were selected for analysis. Further, because of the few respondents four in the “Academic” category, these responses were eliminated from the analysis (see Table 6). This resulted in a total of 34 usable respondents for analysis. The results revealed no significant differences in the burnout scales by practice type. Table 11 summarizes the burnout scales by practice type.

Table 11

*Copenhagen Burnout Inventory Subscale Mean Scores by Practice Type*

<table>
<thead>
<tr>
<th>Practice Type</th>
<th>Personal-Related</th>
<th>Work-Related</th>
<th>Client-Related</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Group (employed)</td>
<td>9</td>
<td>11.44</td>
<td>5.96</td>
</tr>
<tr>
<td>Group (private)</td>
<td>7</td>
<td>12.86</td>
<td>2.93</td>
</tr>
<tr>
<td>Solo practice</td>
<td>8</td>
<td>11.00</td>
<td>6.28</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
<td>10.80</td>
<td>4.49</td>
</tr>
</tbody>
</table>

Although the analysis failed to identify any significant differences by physician practice type and burnout, a review of the number of physicians in each category provided some additional insights into severity of burnout by category and practice type. Specifically, Family Medicine physicians experienced a higher percentage of burnout.
with their work than compared with the other two categories of professional burnout and client-related burnout as measured by the Copenhagen Burnout Inventory (32.2% of physicians fell into the “seek help” category in the work burnout subscale compared to 8.8% in professional burnout and 5.8% in client-related burnout). Tables 12, 13, and 14 display the severity of burnout by burnout category and practice type.

Table 12

*Personal Burnout Classifications by Physician Practice Type*

<table>
<thead>
<tr>
<th>Practice Classification</th>
<th>Copenhagen Burnout Classifications</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Sign</td>
<td>Some Signs</td>
<td>Some Symptoms</td>
<td>Seek Help</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Solo</td>
<td>8</td>
<td>2</td>
<td>40.0</td>
<td>2</td>
<td>16.7</td>
</tr>
<tr>
<td>Group (Private)</td>
<td>7</td>
<td>0</td>
<td>0.0</td>
<td>2</td>
<td>16.7</td>
</tr>
<tr>
<td>Group (Employed)</td>
<td>9</td>
<td>1</td>
<td>20.0</td>
<td>5</td>
<td>41.7</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
<td>2</td>
<td>40.0</td>
<td>3</td>
<td>25.0</td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td>5</td>
<td>100.0</td>
<td>12</td>
<td>100.0</td>
</tr>
<tr>
<td>Total Percent of Burnout Severity</td>
<td>34</td>
<td>5</td>
<td>14.7</td>
<td>12</td>
<td>35.2</td>
</tr>
</tbody>
</table>
### Table 13

**Work Burnout Classifications by Physician Practice Type**

<table>
<thead>
<tr>
<th>Practice Classification</th>
<th>Copenhagen Burnout Classifications</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Sign</td>
<td>Some Signs</td>
<td>Some Symptoms</td>
<td>Seek Help</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Solo</td>
<td>8</td>
<td>1</td>
<td>25.0</td>
<td>2</td>
<td>18.2</td>
<td>4</td>
</tr>
<tr>
<td>Group (Private)</td>
<td>7</td>
<td>0</td>
<td>0.0</td>
<td>2</td>
<td>18.2</td>
<td>4</td>
</tr>
<tr>
<td>Group (Employed)</td>
<td>9</td>
<td>1</td>
<td>25.0</td>
<td>5</td>
<td>45.5</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
<td>2</td>
<td>50.0</td>
<td>2</td>
<td>18.2</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td>4</td>
<td>100.0</td>
<td>21</td>
<td>100.0</td>
<td>15</td>
</tr>
<tr>
<td>Total Percent of Burnout Severity</td>
<td>34</td>
<td>7</td>
<td>20.5</td>
<td>21</td>
<td>61.7</td>
<td>15</td>
</tr>
</tbody>
</table>
Table 14

*Client Burnout Classifications by Physician Practice Type*

<table>
<thead>
<tr>
<th>Practice Classification</th>
<th>Copenhagen Burnout Classifications</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Sign</td>
<td>Some Signs</td>
<td>Some Symptoms</td>
<td>Seek Help</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>n</td>
<td>%</td>
<td>N</td>
<td>n</td>
</tr>
<tr>
<td>Solo</td>
<td>8</td>
<td>3</td>
<td>50.0</td>
<td>2</td>
<td>7.1</td>
</tr>
<tr>
<td>Group (Private)</td>
<td>7</td>
<td>0</td>
<td>0.0</td>
<td>3</td>
<td>10.7</td>
</tr>
<tr>
<td>Group (Employed)</td>
<td>9</td>
<td>1</td>
<td>16.7</td>
<td>6</td>
<td>42.9</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
<td>2</td>
<td>33.3</td>
<td>3</td>
<td>10.7</td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td>6</td>
<td>100</td>
<td>14</td>
<td>100</td>
</tr>
</tbody>
</table>

Total Percent of Burnout Severity: 34, 6, 17.6, 14, 41.1, 12, 35.2, 2, 5.8

**Research Question 2**

Research question 2: *Do significant differences exist with physician overall satisfaction with the electronic health record components within various physician demographic categories?* This research question examined the same demographics as in Research Question 1.

To examine whether if differences exist in electronic health record satisfaction scores by demographic variables, *t*-test and ANOVA techniques were utilized. A *t*-test was performed on the electronic health record satisfaction score by responding gender. Table 15 summarizes the means by gender for satisfaction.
Table 15

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>26</td>
<td>20.65</td>
<td>13.05</td>
</tr>
<tr>
<td>Female</td>
<td>42</td>
<td>23.68</td>
<td>10.84</td>
</tr>
</tbody>
</table>

To examine whether if differences exist by years practicing and practice type, analysis of variances were performed. As in Research Question 1, in order to perform the analysis, years practicing was subjected to a frequency distribution that allowed the researcher to divide the distribution into three groups: new career, mid-career, and senior career, which divided years practicing into nearly equal categories. No significant differences were found in this analysis of variance. Table 16 summarizes these results.

Table 16

<table>
<thead>
<tr>
<th>Years practicing</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>New (1-13 years)</td>
<td>20</td>
<td>23.35</td>
<td>10.34</td>
</tr>
<tr>
<td>Mid-career (14-24 years)</td>
<td>21</td>
<td>27.66</td>
<td>13.94</td>
</tr>
<tr>
<td>Senior (25+ years)</td>
<td>24</td>
<td>17.29</td>
<td>8.92</td>
</tr>
</tbody>
</table>

To examine the differences by practice type and electronic health record component satisfaction, an analysis of variance was performed. As in Research Question 1, distributions of practices were skewed toward the “group (employed) practice” category (see Table 6). The same sample of nine respondents were selected for this
analysis that was used in Research Question 1. Also, as in Research Question 1, four members in the “Academic” category were eliminated from the analysis (see Table 17) due to the small size. This resulted in a total of 34 usable respondents. The results showed no significant differences in the practice type.

Table 17

<table>
<thead>
<tr>
<th>Practice Type</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group (employed)</td>
<td>9</td>
<td>26.77</td>
<td>14.15</td>
</tr>
<tr>
<td>Group (private)</td>
<td>7</td>
<td>26.57</td>
<td>11.47</td>
</tr>
<tr>
<td>Solo practice</td>
<td>8</td>
<td>20.66</td>
<td>11.35</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
<td>21.86</td>
<td>19.72</td>
</tr>
</tbody>
</table>

**Research Question 3**

The third research question aimed to answer: *Is there a significant relationship between physician burnout, satisfaction with the electronic health record, and the electronic health record’s perceived effect on patient care?* To address this question, a correlation was performed between the three burnout categories of the Copenhagen Burnout Inventory (personal, work-related, and client-related); the estimated satisfaction with the electronic health record score; and the electronic health record perceived effect on patient care score. Table 18 displays the correlations. The methodology that outlined how the estimated satisfaction with the electronic health record score and the electronic health record perceived effects on patient care score were determined were outlined earlier in this chapter.
Table 18

_Correlation of Electronic Health Record Satisfaction and Patient Care_

<table>
<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Total time spent in the electronic health record</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Electronic prescribing</td>
<td>0.34</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Number of mouse clicks per patient encounter</td>
<td>0.77</td>
<td>0.23</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Ability to create a note</td>
<td>0.45</td>
<td>0.36</td>
<td>0.57</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Overall, how satisfied are you with the amount of support you receive to navigate the electronic health record?</td>
<td>0.42</td>
<td>0.35</td>
<td>0.43</td>
<td>0.52</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Overall, how satisfied are you with the electronic health record platform you currently utilize?</td>
<td>0.51</td>
<td>0.34</td>
<td>0.58</td>
<td>0.63</td>
<td>0.71</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. To what degree do you feel the electronic health record takes time away from patient care?</td>
<td>0.45</td>
<td>0.15</td>
<td>0.44</td>
<td>0.36</td>
<td>0.32</td>
<td>0.45</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. To what degree do you feel patient care is adversely affected by the amount of electronic health record documentation you must complete?</td>
<td>0.40</td>
<td>0.21</td>
<td>0.44</td>
<td>0.43</td>
<td>0.29</td>
<td>0.38</td>
<td>0.75</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Personal burnout</td>
<td>-0.22</td>
<td>0.15</td>
<td>-0.32</td>
<td>-0.32</td>
<td>-0.25</td>
<td>-0.23</td>
<td>-0.48</td>
<td>-0.44</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Work-related burnout</td>
<td>-0.29</td>
<td>0.20</td>
<td>-0.37</td>
<td>-0.29</td>
<td>-0.27</td>
<td>-0.25</td>
<td>-0.47</td>
<td>-0.40</td>
<td>0.93</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>11. Client-related burnout</td>
<td>-0.24</td>
<td>0.16</td>
<td>-0.26</td>
<td>-0.27</td>
<td>-0.16</td>
<td>-0.09</td>
<td>-0.35</td>
<td>-0.27</td>
<td>0.67</td>
<td>0.75</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*a = Correlation is significant at the .05 level; b = Correlation is significant at the .01 level.*
Weak but significant correlations were seen for item 3 (number of mouse clicks per patient encounter), item 4 (ability to create a note), and item 5 (Overall, how satisfied are you with the amount of support you receive to navigate the electronic health record?) and personal burnout. Weak but significant relationships were found between item 1 (total time spent in the electronic health record), item 3 (number of mouse clicks per patient encounter), item 4 (ability to create a note), item 5 (Overall, how satisfied are you with the amount of support you receive to navigate the electronic health record?), and item 6 (Overall, how satisfied are you with the electronic health record platform you currently utilizes) with work-related burnout. Weak but significant relationships were found between item 3 (number of mouse clicks per patient encounter), item 4 (ability to create a note), and item 8 (To what degree do you feel patient care is adversely affected by the amount of electronic health record documentation you must complete?) with client-related burnout.

Strong and significant relationships existed with item 7 (to what degree do you feel the electronic health record takes time away from patient care?) and item 8 (To what degree do you feel patient care is adversely affected by the amount of electronic health record documentation you must complete?) with personal and work burnout, as well as with item 7 and client-related burnout.

Research Question 4

Research question four: What are the key elements identified as strengths and weaknesses of the electronic health record? This qualitative research question was addressed through questions 32 and 33 of the survey, which were: “What would you address as the strengths of the electronic health record” and “What would you address as
the weaknesses of the electronic health record,” respectively. The responses required open-ended responses, which allowed the participant to free type a response in a text box.

To address the last two questions of the survey, which addressed the strengths and weaknesses associated with the electronic health record, the researcher manually coded the responses of the open-ended responses using a method of grouping responses by similar themes. The strengths of the electronic health record varied to a high degree. Table 19 identifies the frequencies associated with perceived strengths of the electronic health record.

Table 19

<table>
<thead>
<tr>
<th>Strengths Identified of the Electronic Health Record</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legibility</td>
<td>6</td>
<td>9.52</td>
</tr>
<tr>
<td>Electronic prescribing</td>
<td>9</td>
<td>14.29</td>
</tr>
<tr>
<td>Ease of use</td>
<td>3</td>
<td>4.76</td>
</tr>
<tr>
<td>None</td>
<td>4</td>
<td>6.35</td>
</tr>
<tr>
<td>Access</td>
<td>14</td>
<td>22.22</td>
</tr>
<tr>
<td>Data management</td>
<td>15</td>
<td>23.81</td>
</tr>
<tr>
<td>Communication</td>
<td>3</td>
<td>4.76</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>9</td>
<td>14.29</td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
<td>100</td>
</tr>
</tbody>
</table>
The second part of this research question assessed the major weaknesses of the electronic health record perceived by physicians utilizing the same grouping and coding methodology. Table 20 lists the frequencies associated with perceived weaknesses.

Table 20

*Weaknesses Identified of the Electronic Health Record*

<table>
<thead>
<tr>
<th>Weaknesses</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too many clicks</td>
<td>13</td>
<td>20.63</td>
</tr>
<tr>
<td>Time consuming</td>
<td>20</td>
<td>31.75</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>30</td>
<td>47.62</td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
<td>100</td>
</tr>
</tbody>
</table>

Compared to the strengths identified with the electronic health record, the weaknesses were more problematic to clearly delineate, as finding similar themes among the responses was much more difficult due to the wide variety of responses. The researcher was able to identify three clear categories determined as weaknesses of the electronic health record.

**Chapter Summary**

This chapter presented the findings of the four research questions guiding a mainly quantitative study exploring physician burnout and the potential relationship to the electronic health record.

With respect to Research Questions 1 and 2, results yielded that there is no significant differences in either Gender or practice type of Family Medicine physicians and their degree of burnout and satisfaction with the electronic health record. However,
there appeared to be a relationship with respect to years practicing and the satisfaction with the electronic health record. Further, there seemed to be a wide degree of burnout which may be affected by practice type.

Research Question 3 showed there was a strong significant relationship between personal and work-related burnout and the perception of the electronic health record interfering with patient care. Further, Research Question three showed a weak, but significant relationship between the three categories of burnout and many components of the electronic health record measured by the survey.

Research Question 4, which explored the perceived strengthens and weaknesses of the electronic health record, was discussed. Physician respondents perceived the weaknesses of the electronic health record to be the amount of mouse clicks required to navigate the platform, as well as the time spend using the platform. However, there also were perceived strengthens of the electronic health record, including access, data management and electronic prescribing.
CHAPTER V: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

The intent of this study was to better understand the relationship and potential impact of the electronic health record may have on physician burnout. As the literature review illustrates, physician burnout is an issue the U.S. healthcare system is struggling with both understanding and addressing.

The analysis of the data, hopefully, will have implications and useful applications for healthcare administrators. The healthcare administrator, in turn, can use the findings to implement meaningful changes in the realm of healthcare organizational management to reduce or possibly eliminate some aspects of physician burnout.

Discussion of Findings

This study was guided by an overall research question: Is there a relationship with the electronic health record and burnout measured by the Copenhagen Burnout Inventory in Family Medicine physicians? To answer that question, a four-question research subset was developed. The findings of those questions and the conclusions drawn are discussed in this chapter.

Research Question 1 Findings

Research Question 1, Do significant differences exist with the degree burnout and physician demographics, was intended to establish an overall baseline perception of physician burnout for this study. The analysis of this question indicated no significant difference in Family Medicine physician demographics and their degree of burnout. Despite that finding, the data yielded a surprising result during analysis. Physicians in this study, disproportionally, reported feeling burned out with their work to the extent
that they should seek help (32.3% of respondents fell into this category compared to 5.8% of respondents with client-related burnout and 8.8% with personal-related burnout).

**Research Question 2 Findings**

To determine whether if satisfaction of the electronic health record components had an impact on physician burnout, Research Question 2 was developed: *Do significant differences exist with satisfaction of the electronic health record components and Family Medicine physician demographics?* The results of this question were somewhat straightforward. There are no significant differences in the satisfaction of the electronic health record and Family Medicine physician demographics; i.e., demographics of Family Medicine physicians do not differentiate the extent of physician burnout.

**Research Question 3 Findings**

Research Question 3 was designed to determine whether selected components of the electronic health record itself had any relationship with Family Medicine physician burnout. The question was: *Is there a significant relationship between physician burnout, satisfaction with the election health record, and the electronic health record’s perceived effect on patient care?* The results of this question provided some key insights. Family Medicine physicians in this study displayed a significantly strong correlation (*p* < .01) with their perception of selected components of the electronic health record taking time away from patient care, as well as all three subscales of burnout measured by the Copenhagen Burnout Inventory. The time Family Medicine physicians spent in the electronic health record impacted them in a significant way.

There was a significantly strong correlation (*p* < .01) with the perception of the electronic health record impacting patient care and personal and work-related burnout.
subscales. However, there was a significant correlation \( (p < .05) \) with this question and the client-related burnout subscale. This finding supports the idea that the time spent in the electronic health record is likely related to both work and personal burnout experienced by Family Medicine physicians.

The amount of significant relationships found between the three burnout subscales and the components of the electronic health record measured in this study, along with the perception of the electronic health record in patient care, paint a telling story. A total of eight questions addressed either satisfaction with electronic health record components or perceptions that the electronic health record impacts patient care. Of the eight, seven showed a significant correlation (either \( p < .05 \) or \( p < .01 \)) with work-related burnout. Personal burnout showed a significant correlation (either \( p < .05 \) or \( p < .01 \)) with five of the eight questions. Last, client-related burnout proved to have a significant correlation (either \( p < .05 \) or \( p < .01 \)) with four of the eight questions.

These findings, coupled with the results of Research Question 1, suggest Family Medicine physicians are likely experiencing burnout with their work. Findings from Research Question 2 suggest work-related burnout is likely associated with the selected components of the electronic health record.

**Research Question 4 Findings**

Research Question 4, *What are the key elements identified as strengths and weaknesses of the electronic health record*, sought to understand Family Medicine physician strength and weakness perceptions of the electronic health record. The purpose of this question was to understand possible elements that could be contributing to satisfaction, as well as dissatisfaction, with the electronic health record. The data revealed
Family Medicine physicians in this study population appreciated the accessibility (14 total) and data management (15 total) features of the electronic health record platform. Further, Family Medicine physicians in this study indicated they perceived electronic prescribing of medications (9 total) as a strength of the electronic health record platform.

Given the nature of responses for Research Question 4, which was an open-field text for typed responses, the categories were difficult to clearly identify, as responses tended to vary when physicians were asked about the perceived weaknesses of the electronic health record. Responses that were categorized into general responses as weaknesses of the electronic health record were the following attributes: time consuming (20 total), too many clicks (13 total), and miscellaneous (30 total).

Given the wide degree of answers as weaknesses of the electronic health record, it is reasonable to suspect there is a wide disgust for the electronic platform. This seems especially true when compared to the strengths associated with the electronic health record, as responses from physicians tended to revolve around common themes.

**Implication of Findings**

The research questions yielded some common themes, most specifically that Family Medicine physicians experience a very high degree of work-related burnout. Further, there is a very close relationship between the work-related burnout experienced by the Family Medicine physicians in this study and the electronic health record. Nearly all the components and attitudes measured in this survey on the electronic health record significantly correlated with work-related burnout.

Healthcare administrators must address work-related burnout experienced by physicians. As the literature review has suggested, stress and burnout have significant
implications on the quality of healthcare delivered by physicians as well as implications for the healthcare system as a whole. While there may be no clear way of moving away from the electronic health record, existing research provides a template for potential success.

Research conducted by Gidwani et al. (2017) suggested the use of a staff member (known as a scribe) to input information into the electronic health record during a patient visit (while a physician interacts with the patient) increases physician satisfaction and decreases errors. This suggestion dovetails with the findings of this study. It could be postulated that, if Family Medicine physicians had a scribe to assist in inputting data into the electronic health record, their attitudes toward it record may not be as negative since their interaction with the platform would be less, which may result in decreased feelings of work-related burnout. Increased physician satisfaction reduces many components of burnout that are experienced.

Second, and more important, this research brings awareness to the prevalence of work-related burnout experienced by physicians in the U.S. Approximately 32% of physicians in this study indicated they were burned out with their work to the extent that they should seek help—which is a startling fact. Healthcare administrators must explore options to mitigate the feelings of work-related burnout experienced by physicians.

**Limitations**

As with a vast majority of studies, this research encountered some limitations. This study was limited by a less than desirable overall response rate of 9.2%. Of the approximately 739 emails sent to potential respondents, 68 were completed. This study also involved an unbalanced representation of physicians who were employed in a group-
employed setting, as well as the academic setting (39 and 4, respectively). Due to this unbalanced representation, the group-employed respondent set was paired down and the academic category was eliminated. These changes fell in line with other category response rates and enabled valid analysis of variance tests with respect to Research Questions 1 and 2.

Further, this study was limited to one specialty, Family Medicine, in one state within the U.S. The data may have revealed a different outcome if more medical specialties were included, or physicians from more states were invited to participate. More specialty inclusive, larger studies are needed.

**Recommendations for Healthcare Leaders**

As alluded to in previous sections, the effects of physician burnout can result in very large, negative consequences. Surprisingly, there seems to be a lack of fervor surrounding physician burnout compared to other healthcare quality issues, such as length of patient stay or polypharmacy, that are more commonly accepted across the healthcare leadership spectrum as significant issues impacting patient outcomes. Interestingly, research has suggested organizational leadership teams of healthcare institutions can have a direct effect on perceptions of physicians in relation to burnout. Shanafelt et al. (2015) found with their research at Mayo Clinic that “Leadership ratings demonstrated a strong association with burnout and satisfaction at the level of individual physicians after adjusting for age, sex, duration of employment at Mayo Clinic and specialty area” (p. 436).

There is no silver bullet, so to speak, to reduce physician burnout. Not one specific intervention has been shown to be better than another (West et al., 2016).
However, there are suggested interventions which could be employed by healthcare administrators to reduce feelings of burnout which in turn could possibly reduce feelings of work-related burnout.

For primary care physicians, a team approach seems to reduce feelings of stress and burnout (Willard-Grace et al., 2014). Work-related burnout could be reduced by a clinical team whose roles are clearly defined. Healthcare lags behind other industries in their approach to adopting a true team environment, such as a flight crew (Willard-Grace et al., 2014). Healthcare leaders should look to the military and other associations, such as athletic organizations, for suggestions in creating a better sense of a team environment for physicians to reduce burnout.

There also are health systems investigating strategies to decrease primary care physician burnout. One promising intervention is utilizing specialists to assist primary care physicians in sharing responsibility for screenings that historically have been the responsibility of a primary care physician. Arabadjis and Sullivan (2017) discussed a health system in California that uses their specialists to catch those patients who are in need of certain screenings such as colonoscopies, mammograms, etc. The case study reported this strategy had a desirable effect on primary care physician burnout.

Dyrbye and Shanafelt (2011) cited the utilization of existing clinic staff as a way to prevent primary care physicians from overextending. By appropriating clinic staff such as nurses, care navigators, and other personnel in a more efficient manner, tasks such as chronic disease management become more manageable for the primary care physician.

A meta-analysis of physician burnout interventions echoed some of these findings. Wiederhold, Cipresso, Pizziloi, Wiederhold, and Riva (2018) identified six
interventional strategies that were significant in reducing physician burnout. The interventions ranged from art therapy, team-based interventions, counseling interventions, mindfulness, stress management, and breathing techniques. While some interventions can be costly, such as hiring new staff for example, other recommendations can have minimal costs. Team-based interventions are broad. Intramural sports leagues or activities such as family fun night are simple, team-based approaches having minimal costs that health system and other physician employer groups can employ as possible ways to mitigate burnout.

This research offers recommendations to mitigate physicians’ perceptions of burnout. Specifically, this research shows that physicians’ perceptions of all three levels of burnout (work, client, and personal) correlate with the time spent in the electronic health record. This finding pairs with research by Gidwani et al. (2017). Gidwani and colleagues revealed Family Medicine physicians were much more satisfied when they had a scribe to enter notes in the electronic health record. Thus, mitigating a Family Medicine physician’s time interacting with the electronic health record directly correlates with physician satisfaction.

The awareness surrounding physician burnout is moving in a positive direction. Currently, the AMA has invested much into a program built around physician wellness. Numerous other organizations have begun to embrace the issue and offer programs built around raising awareness and promoting positive interventions.

**Recommendations for Future Research**

A strength of this study was that it is one of a few known studies to examine physician burnout utilizing a complete burnout inventory. Most studies that have
examined physician burnout utilized abbreviated inventories, which have caused some to question their reliability. Despite the strength of this study, however, the researcher has identified areas for further research. Focusing on various physician specialties instead of only one (as in this study’s case, Family Medicine) would provide a better understanding of physician work-related burnout, as well as burnout that can be attributed to the electronic health record.

More research also is needed in addressing interventions which may mitigate burnout experienced by physicians. As alluded to earlier, there is no silver bullet, so to speak, in stopping or decreasing burnout. For now, it is much more of a mixed-methods approach. More research dedicated to physician burnout interventions is needed to address the large issues of burnout that physicians are experiencing and, increasingly, healthcare organizations must deal with.

**Chapter Summary**

Understanding the underpinnings of physician burnout is important to the American healthcare system. The system is highlighted by many looming issues, but none are as important as the lack of patient access to physicians, which is forecasted to worsen in the coming years. The shortage of physicians can be attributed to many factors. The cost of becoming a physician is rather high compared to many other professions, resulting in a large amount of student debt. The profession itself is filled with long hours, stress, and increasing regulations which prevent autonomy.

As burnout has direct implications on physician turnover, quality of care, as well as other implications, it is certainly important for healthcare administrators of all capacities to understand the factors leading to burnout. While this research has focused
on physician burnout, it would benefit administrators to understand burnout in general, as the condition also impacts other healthcare workers such as nurses, therapists, and other frontline workers.

In conclusion, this study builds awareness around the issues of physician stresses, particularly the electronic health record. This study comes at a unique time when awareness and interest surrounding physician burnout is very high. This chapter presented the findings of the study, which revealed the relationship between family medicine physician burnout and the electronic health record. At a time when physician wellness issues are coming into focus, this study is both relevant and timely.
REFERENCES


Schutte, L. (2012). What you don’t know can cost you: Building a business case for recruitment and retention best practices. Association of Staff Physician Recruiters


Dear Zack Ward,

Thanks a lot for your mail. You are hereby granted permission to use the Copenhagen Burnout Inventory on the condition that you clearly indicate that you are using the CBI and cite relevant references in this regard.

You can find the CBI-questionnaire if you follow this link:
http://www.arbejdsmiljofoerskning.dk/en/publikationer/spoergeskemaer/udbraendthed

You can read more about the CBI if you follow this link:
http://www.arbejdsmiljofoerskning.dk/da/publikationer/boeger%20og%20rapporter/boeger%20og%20rapporter?publicationid=489

And you are, of course, welcome to contact me again in case of questions.

Sincerely yours,

Thomas Clausen

Thomas Clausen (TCL)
Senior Researcher, MSc, PhD

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T +45 39 16 52 00 | F +45 39 16 52 01
Secure e-mail: nfa@nfa.dk | W nfa.dk

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APPENDIX B: Survey Instrument

1. What is your sex?
   Male   Female

2. What is your age?

3. How many years have you been practicing?

4. Which of the following best describes your practice setting?
   Solo practice  Group (private practice)  Group (employed practice)  Academic  Other

5. How often do you feel tired?
   Always  Often  Sometimes  Seldom  Never/Almost never

6. Are you exhausted in the morning at the thought of another day at work?
   Always  Often  Sometimes  Seldom  Never/Almost never

7. Do you feel burnt out because of your work?
   To a very high degree  To a high degree  Somewhat  To a low degree  To a very low degree

8. How often are you physically exhausted?
   Always  Often  Sometimes  Seldom  Never/Almost never

9. Does your work frustrate you?
   To a very high degree  To a high degree  Somewhat  To a low degree  To a very low degree

10. Do you find it hard to work with patients?
    To a very high degree  To a high degree  Somewhat  To a low degree  To a very low degree

11. Is your work emotionally exhausting?
    To a very high degree  To a high degree  Somewhat  To a low degree  To a very low degree
12. Do you find it frustrating to work with patients?
To a very high degree  To a high degree  Somewhat  To a low degree  To a very low degree

13. Does it drain your energy to work with patients?
To a very high degree  To a high degree  Somewhat  To a low degree  To a very low degree

14. How often do you think: “I can’t take it anymore?”
Always  Often  Sometimes  Seldom  Never/Almost never

15. Are you tired of working with patients?
Always  Often  Sometimes  Seldom  Never/Almost never

16. Do you feel that you give more than you get back when you work with patients?
To a very high degree  To a high degree  Somewhat  To a low degree  To a very low degree

17. To what degree do you feel the electronic health record takes time away from patient care?
To a very high degree  To a high degree  Somewhat  To a low degree  To a very low degree

18. How often are you emotionally exhausted?
To a very high degree  To a high degree  Somewhat  To a low degree  To a very low degree

19. To what degree do you feel patient care is adversely affected by the amount of electronic health record documentation you must complete?
To a very high degree  To a high degree  Somewhat  To a low degree  To a very low degree

20. How often do you feel worn out?
Always  Often  Sometimes  Seldom  Never/Almost never

21. Do you feel worn out at the end of the working day?
Always  Often  Sometimes  Seldom  Never/Almost never
22. Do you feel that every working hour is tiring for you?
Always          Often          Sometimes         Seldom         Never/Almost never

23. How often do you feel weak and susceptible to illness?
Always          Often          Sometimes         Seldom         Never/Almost never

24. Do you have enough energy for family and friends during leisure time?
Always          Often          Sometimes         Seldom         Never/Almost never

25. Do you sometimes wonder how long you will be able to continue working with patients?
Always          Often          Sometimes         Seldom         Never/Almost never

For the next set of questions, please circle the number that best represents your satisfaction toward the topic. Use this scale:
1 = Very low satisfaction................................. 10 = Very high satisfaction

<table>
<thead>
<tr>
<th>Survey Questions</th>
<th>Your Satisfaction Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>26. Total time spent doing tasks in the electronic health record</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>27. Electronic prescribing†</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>28. Number of mouse clicks per patient encounter†</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>29. Ability to create a note†</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>30. Overall, how satisfied are you with the amount of support you receive to navigate the electronic health record? †</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>31. Overall, how satisfied are you with the electronic health record platform you currently utilize? †</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
</tbody>
</table>

32. What would you identify as the strengths of the electronic health record?
33. What would you identify as the weaknesses of the electronic health record?
APPENDIX C: IRB Approval Letter

DATE: May 30, 2018
TO: Zack Ward
FROM: Western Kentucky University (WKU) IRB

PROJECT TITLE: [1242025-1] Electronic Health Record's Relationship to Physician Stress
REFERENCE #: IRB 18-409
SUBMISSION TYPE: New Project
ACTION: APPROVED
APPROVAL DATE: May 30, 2018
REVIEW TYPE: Exempt from Full Board Review

Thank you for your submission of New Project materials for this project. The Western Kentucky University (WKU) IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Exempt from Full Board Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding followed by an implied consent form. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

This project has been determined to be a Minimal Risk project.

Please note that all research records must be retained for a minimum of three years after the completion of the project.

If you have any questions, please contact Paul Mooney at (270) 745-2129 or irb@wku.edu. Please include your project title and reference number in all correspondence with this committee.
This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Western Kentucky University (WKU) IRB's records.
Dear Physician,

I am a doctoral student at Western Kentucky University conducting research into factors related to physician burnout, an extremely important matter facing physicians. To investigate this topic, I am surveying Family Medicine physicians across Kentucky seeking their perspective on the underlying elements that may contribute to physician burnout.

The Kentucky Academy of Family Physicians has endorsed this study and I am asking for your help by completing a brief survey. The survey is web based, anonymous, and only takes few minutes to complete. As a practicing physician, your input is critical to success of this project and to the understanding of issues related to burnout.

The Kentucky Academy of Family Physicians will be provided a summary of the study results at the conclusion of the study. Should you have any questions, please don't hesitate to contact me, Zack Ward, at zachary.ward@wku.edu.

Again, thank you for your time and your participation is very much appreciated.

Please click here to begin survey.
Make the Member Connection!

The 67th Annual Scientific Assembly - ONE DAY CME SESSION
September 28th, 2018
Embassy Suites East
9940 Corporate Campus Drive
Louisville, KY

- ABFM KSA (SAMS) Workshop - Hypertension
- Screening, Brief Intervention, and Referral to Treatment (SBIRT) Training - Learn how to discuss addiction with your patients
- All Member Meeting, Installation, & Award Luncheon

Up to 12 TOTAL CME

AAFP This Live activity, Opioid Case Management: Dealing with Our Patients, Our Friends, Our Families with Substance Abuse Disorders, with a beginning date of 08/21/2018, has been reviewed and is acceptable for up to 12.00 Prescribed credit(s) by the American Academy of Family Physicians. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

AAOA CME activities approved for AAFP credit are recognized by the AOA as equivalent to AOA Category 2 credit.

AMA AAFP Prescribed credit is accepted by the American Medical Association as equivalent to AMA PRA Category 1 Credit™ toward the AMA Physician's Recognition Award. When applying for the AMA PRA, Prescribed credit earned must be reported as Prescribed credit, not as Category 1.

KBML 10B1 - 8/21/2018 workshop titled "Family Medicine Leading a Healthy Kentucky" has been approved for 4.5 Category 1 hours, any remaining hours will count towards their regular CME's. Please provide the following ID number on the participants certificates: ID: 0718-H45-KA22a

AAFP Prescribed credit is accepted by the following organizations. Please contact your organization directly about how you should report the credit you have earned.

- American Academy of Physician Assistants (AAPA)
- National Commission on Certification of Physician Assistants (NCCPA)
- American Nurses Credentialing Center (ANCC)
- American Academy of Nurse Practitioners Certification Board (AANPCB)
- American Association of Medical Assistants (AAMA)
- ABFM
- American Board of Emergency Medicine (ABEM)
- American Board of Preventive Medicine (ABPM)

Register Here

Mailing Address: P.O. Box 1444, Ashland, KY 41105-1444
Office: 1-888-287-9339 Fax: 1-888-287-0662
Appendix E: Copenhagen Burnout Inventory Scoring

CBI

The questionnaire consists of three parts.

1. Personal burnout
2. Work-related burnout
3. Client-related burnout

The form is designed so that the individual can easily assess his or her own burnout in the three areas. On the last page of the schema you will find how to interpret the results. We compare here with the study PUMA (Project Burnout, Motivation and job satisfaction), where approximately 2000 people have filled in the form.

1. Personal burnout

_Just tick one box for each question and answer all the questions._

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>ALWAYS</th>
<th>OFTEN</th>
<th>SOMETIMES</th>
<th>RARELY</th>
<th>NEVER OR ALMOST NEVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often do you feel tired?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often are you physically exhausted?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often are you emotionally exhausted?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you think: &quot;Now I can not clear more &quot;?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you feel stretched?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you feel weak and</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
susceptible to disease?

Cross and then put the numbers together.

Write the sum here: ________

---

**Page 2**

### 2. Work-related burnout

*Just tick one box for each question and answer all the questions.*

<table>
<thead>
<tr>
<th>Does your work matter to you? emotional?</th>
<th>Very high degree</th>
<th>Greatly</th>
<th>Partly</th>
<th>To a small extent, I very little degree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
</tr>
</tbody>
</table>

| Do you feel frustrated by your work? the? | ❑                | ❑      | ❑      | ❑                                      |
| Do you feel burned because of your work? | ❑                | ❑      | ❑      | ❑                                      |

<table>
<thead>
<tr>
<th>Do you feel that every hour is one load for you when you are on occupation?</th>
<th>Always</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never / almost never</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
</tr>
</tbody>
</table>

| Are you exhausted in the morning by the thought of yet another day the work? | ❑      | ❑     | ❑         | ❑      | ❑                   |
| Do you feel driven out when yours? workday is over | ❑      | ❑     | ❑         | ❑      | ❑                   |

<table>
<thead>
<tr>
<th>Do you have the profits to be together with family and friends in spare time?</th>
<th>Never / almost never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
</tr>
</tbody>
</table>
3. Client-related burnout

(The word "clients" can be replaced with patients, students, residents, inmates, etc., depending on what is relevant in the situation).

*Just tick one box for each question and answer all the questions.*

<table>
<thead>
<tr>
<th></th>
<th>Very high degree</th>
<th>Greatly</th>
<th>Partly</th>
<th>To a small extent, I very little degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you feel that it is stressful to work with clients?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Are you losing energy for that work with clients?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Do you feel that it’s frustrating that work with clients?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Do you feel you give more than you? get back in your work with clients?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Are you tired of working with clients?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Are you sometimes in doubt about where as long as you can keep going work with clients?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
Tick and then add the numbers for all 6 questions.

Write the sum here: __________

---

**Interpretation of results**

1. **Personal burnout:**
   - 0-5 points: You have no signs of burnout
   - 6-11 points: There are some things that you need to be aware of
   - 12-17 points: You have symptoms of burnout that you should be aware of
   - 18+: You are so exhausted and burned that you should immediately seek help to change your situation

   The "national average" for Danes is 7.7

   The average for the participants in PUMA is 8.6
   - Midwives 10.7
   - Home helpers in the metropolitan area 10.3
   - Nurses 9.1
   - Home helpers in a provincial municipality 7.9
   - Divisional and nurses 7.1

2. **Work-related burnout:**
   - 0-6 points: You have no signs of burnout in relation to your work
   - 7-13 points: There are some things that you need to be aware of in relation to your work
   - 14-20 points: You have symptoms of burnout that you should be aware of
   - 21+: You are so exhausted and out of date that you should seek help immediately to change your work situation
Here we do not know the "national average".
The average for all participants in PUMA is 9.2
- Midwives 12.2
- Home helpers in the metropolitan area 11.7
- Nurses 10.2
- Department and nurses 8.1
- Home helpers in a provincial municipality 7.9

3. Client-related burnout:

0-5 points: You have no signs of burnout in relation to your work with clients
6-11 points: There are some things that you need to be aware of in relation to your work
12-17 points: You have symptoms of burnout that you should be aware of
18+: You are so exhausted and lost for energy working with clients that you should immediately apply help to change your situation

Here we do not know the "national average"
The average for all participants in PUMA is 7.2
- Prison Officers 9.8
- Midwives 9.0
- Home helpers in the metropolitan area 8.6
- Nurses 7.5
- Home helpers in a provincial municipality 6.4
- Divisional and nurses 4.4

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Tel.: 39165200, e-mail: mb@ami.dk & ttk@ami.dk