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Strategies Physicians Apply to Value-Based Patient Care for Quality Reimbursement

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Walden University
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Abstract

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By

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MD, St Martinus Faculty of Medicine, 2017

MBA, Plymouth State University, 2014

BS, University of Miami, 2011

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration – Healthcare Administration

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Abstract

Low-quality value-based patient care negatively impacts physicians' ability to maintain private solo practices. Physicians who lack strategies to apply value-based patient care may lose their ability to stay in a private solo practice. Grounded in the complex adaptive system theory, the purpose of this qualitative multiple case study was to explore strategies used by private solo physicians that provided value-based patient care. Participants were four physicians in solo private practice who successfully applied value-based patient care to maintain their private solo practice. Data were collected from semistructured interviews and organizational documents and analyzed using thematic analysis. Three themes emerged: (a) electronic medical record fitness with the physician, (b) sharing of workload to reduce burnout, and (c) choosing the right outsourced billing service. A key recommendation for solo practitioners is to select an EMR system to achieve value-based patient care and correct payer reimbursement. The implications for positive social change include the potential for physicians to improve healthcare delivery to benefit the health, dignity, and quality of life for local citizens.

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Dedication

I dedicate this doctoral study to my family, Munawar, Naila, Ankush, Sarmad, Malahia, Usama, and Rabea. I appreciate every ounce of support you have provided to me over the years so that I can dedicate my time to completing my study. I also dedicate this study to the participants who helped me complete this case study. Thank you.

Acknowledgments

I want to acknowledge and thank all my family, friends, and professors for their generosity and learned experiences. Without the support of my first chair, Dr. Kenneth D. Gossett, on a day-to-day basis throughout the completion of this case study, I would not have made it to this day. Thank you for being patient with me, Dr. Warren P. Lesser, and for your detailed review of my work Dr. Rollis D. Erickson. I want to acknowledge all the professors at Walden who have helped be the backbone of my degree.

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Section 1: Foundation of the Study

Background of the Problem

In 2009, Congress passed the Health Information Technology for Economic and Clinical Health Act (HITECH) Act to increase the use of electronic medical records (EMR) systems to improve the health of the average American (Hsiao et al., 2012). DesRoches et al. (2013) indicated that the HITECH Act was an imperative change in healthcare legislation. This legislative change forced hospitals and healthcare practices throughout the nation to implement EMR systems and update older EMR systems (Everson et al., 2020). By focusing on health information technology (HIT) usage, HITECH changed the relationship between healthcare providers, organizations, patients, and payers (Adler-Milstein et al., 2011). Hsiao et al. (2012) found that 124,000 eligible physicians had applied for $30 billion in incentives in 2011 and subsidies for health information exchanges and education and the purchasing of HIT hardware and software programs (Adler-Milstein et al., 2011; Jha, 2010).

Implementation of EMR systems created a change in workflows across the United States in hospitals and healthcare providers' offices (Pugh, 2019). According to Brooks and Grotz (2010), a 50% reduction in productivity was documented in paperwork processing because hospital administrators and individual physicians had limited strategies for transitioning to a new EMR system. Song et al. (2011) reported that EMR system implementation costs ranged from $40 million to $350 million, depending on the healthcare organization's size. In recognition of these costs, Fleming et al. (2014) found that implementing an EMR system may save only about $15,000 per provider or reduce

one administrative staff member. Many physicians and administrators began to wonder if the transition to an EMR system was worth the costs from a cost-benefit analysis (Ajami & Bagheri-Tadi, 2013).

Problem Statement

Based upon data submitted in 2018, 2% of all physicians and 13% of small practices of physicians will receive a negative reimbursement adjustment in 2020 by the Centers for Medicare and Medicaid Services (CMS) under its new quality payment program (QPP; Rohwer & Rohwer, 2020). In 2020, physicians who did not submit sufficient QPP measures in 2018 to CMS will receive a reimbursement reduction of up to 5% or a minimum of $4,500; and small physician practices could lose millions of dollars of revenue depending upon the number of Medicaid and Medicare patients to whom they provide services (U.S. Centers for Medicare & Medicaid Services, 2020). The general business problem is that some physicians are not providing value-based care and, as a result, are experiencing reductions in reimbursements and revenue. The specific business problem is some private practice physicians lack strategies to use and adopt EMR systems to include meaningful use (MU) guidelines under the QPP directive for value-based care for patients.

Purpose Statement

The purpose of this multiple qualitative case study is to explore strategies private practicing physicians use to adopt an EMR system that conforms to MU guidelines under the QPP directive for value-based care for patients. The specific population is four physicians with private practices in the Mid-Atlantic United States area, who have

successfully implemented an EMR per the CMS guidelines. Physicians believe that using EMR systems has improved record-keeping quality and made it easier to follow patients (Greiver et al., 2011). This study's results could help generate positive social change by providing physicians with EMR systems that can improve the quality of healthcare in the United States.

Nature of the Study

In considering which methodology to use for research, researchers can use methods that are either qualitative, quantitative, or mixed (Yin, 2018). Saunders et al. (2015) noted that researchers use quantitative measures and inferential statistics to develop hypotheses for examining variables' characteristics or relationships in quantitative studies. I did not use a quantitative approach for this study because I did not test a hypothesis to examine the significance of null and alternative hypotheses. Additionally, I did not use a mixed-methods case study because I did not need a quantitative method for addressing the purpose of the envisioned research study. Researchers use the qualitative method to fully explore and understand phenomena by gathering rich, thick data for patterned analysis (Fusch et al., 2018). I focused on a select group of private practice physicians who successfully practice in multiple sites value-based healthcare per CMS guidelines that have implemented an EMR to improve business performance and quality patient care.

For this case study, as the researcher, I considered four qualitative research designs for a qualitative study on strategies for improving electronic medical records documentation, including (a) ethnography, (b) narrative inquiry, (c) phenomenology, and

(d) case study. Case study research is a tool to answer the questions, why and how. As recommended by Saunders et al. (2015), I explored and understand participants' experiences in the form of rich data and thick descriptions. Castleberry and Nolen (2018) have determined that qualitative researchers typically use ethnographic, phenomenological, or case study designs. Rashid et al. (2015) and Yin (2018) suggested that ethnography is not appropriate when a study's focus does not illuminate observations relating to cultural group experiences witnessed over an extended time. Phenomenology is not appropriate when the objective of a proposed study is not to understand the essence of human experience in the form of lived experiences about a phenomenon (Moustakas, 1994; Quant et al., 2013). A phenomenological researcher describes the personal meaning of individuals' lived experiences regarding a phenomenon (Ginsberg & Sinacore, 2013). To address my research, I used a multiple case study. Researchers use multiple case studies to explore the subject phenomenon in various situations and identify similarities and differences among many cases (Yin, 2018). The multiple case study approach was an appropriate choice as I interviewed physicians at various healthcare settings and compared findings across the different cases.

Research Question

The primary research question for this study was: What strategies do some physicians successfully use to adopt an EMR system to follow MU guidelines under the QPP directive?

Interview Questions

1. Which EMR system do you use in your private practice and what strategies have you found most helpful in implementing the CMS guidelines?
2. Stage One of MU began in 2011 and ended in 2013; how did you succeed in meeting the 15 core objectives and 5 of the ten menu objectives?
3. For Stage Two of MU, how did you succeed in meeting the criteria that focused on ensuring MU of EMR systems and exchanging electronic information in the most organized format?
4. For Stage Three of MU, how did you meet the eight optional requirements for providers in 2017 and mandatory for all participants in 2018?
5. How, if at all, based upon your experience, did using EMR foster your practice's profitability?
6. How are strategies that involve EMR and MU helping your practice and patients?
7. What else can you tell me about the strategies you have developed and implemented regarding EMR systems for MU under the QPP?

Conceptual Framework

In this study, I explored the strategies private practicing physicians successfully use to follow MU guidelines to implement EMR systems under the QPP directive. To successfully achieve this goal, I selected the complex adaptive system theory (CAS) as my study's conceptual framework. According to Wallis (2006), the CAS theory's history dates to the early 1990s, and the researchers most frequently cited are Gel-Mann, Holland, and Waldrop. According to Miller and Page (2007), Holland's study *Adaption in*

Natural and Artificial Systems: An Introductory Analysis with Applications to Biology, Control and Artificial Intelligence is the foundation of complex adaptive system study method. Cohesively, an organization's complexity is created when members of the organization's hierarchy provide both internal and external inputs and can create and maintain positive and negative feedback loops to sustain the organization's position in the business world (Davis et al., 2015). Gossett et al. (2019) described how feedback loops can affect the safety and quality of services, healthcare costs, and stakeholder satisfaction in healthcare systems.

Physicians can maintain their practices either as a sole proprietor, join a small or large group of physicians, or become a hospitalist. At each type of practice, the range of complexity varies depending on numerous variables such as following CMS guidelines, provider-patient communication, etc. The physician's strategy as a manager requires examination from two viewpoints, business hierarchy to business hierarchy and the physician to the patient. Moreover, Pype et al. (2017) implied that the use of CAS to study the integration of the part of a healthcare organization is considered an overall right choice. CAS can be used to analyze how private practicing physicians have successfully used their EMR system to meet the interoperability and information exchange requirements of the Medicare Access and Children's Health Insurance Program (CHIP) Reauthorization Act (MACRA) 2015. For this case study, I used the CAS framework approach to facilitate my understanding of the strategies participants used to follow MU guidelines to implement EMR systems under the QPP directive.

Operational Definitions

Centers for Medicare and Medicaid Services (CMS): Medicaid and Medicare, established in 1965, under the Centers of Medicare and Medicaid Services (CMS) of the United States Department of Health and Human Services (Enders et al., 2021).

Children's Health Insurance Program (CHIP): Medicaid and the Children's Health Insurance Program (CHIP) provide health insurance to 38% of all children in the United States. Uninsured rates continued to fall over the past decade, and citizen children in immigrant families experienced the most dramatic gains. Our objective is to test whether states have managed to close Medicaid enrollment gaps between US citizen children in native and immigrant families (Seiber & Goldstein, 2019).

Electronic medical records (EHRs): EHRs are composed of patients' personal and historical information such as demographics, medications, laboratory test results, diagnosis codes, and procedures (Yadav et al., 2018).

Meaningful Use (MU): MU is an endeavor initiated by the CMS and the Office of the National Coordinator for Health IT. It involves using certified electronic medical records (EMR) fundamentally to improve the quality, safety, and efficiency of care. One of the MU requirements is to engage patients and families in their health by offering secure, web-based access to patients' health information and providing tools supporting electronic communication between patients and providers (Clarke et al., 2020).

Medicare Access and CHIP Reauthorization Act (MACRA): A legislation that replaced the sustainable growth rate system and established in its stead a mandatory new program intended to reward healthcare providers for higher quality care while reining in costs (Cardona et al., 2020).

Merit-based Incentive Payment System (MIPS): MIPS is a value-based reimbursement system beginning in 2017. The MIPS adjusts payment rates to providers based on a composite score of performance across four categories: quality, advancing care information, clinical practice improvement activities, and resource use (Rathi et al., 2018).

Quality Payment Program (QPP): The QPP under MACRA's goals of lowering cost, improving the health of patients, and expanding access to care by paying physicians who perform better on measures of healthcare quality and cost higher reimbursement rates than those who perform poorly on those metrics (Cardona, 2020).

Assumptions, Limitations, and Delimitations

I acknowledge the study's set of assumptions, limitations, and delimitations. Assumptions are aspects of the study or certain conditions that the researcher assumes and holds as true for the purpose of the study, i.e., the use of EMR is consistent throughout physician practices (Yin, 2018). Limitations are areas which the researcher does not have control over, i.e., financials, administration, staff of a physician's practice (Yin, 2018). Delimitations are areas that serve as boundaries of the study, which are set by the researcher (Yin, 2018). One delimitation of the study is the Walden University

doctoral study rubric, and this particular delimitation is also a valuable part for me to remain focused as an academic researcher.

Assumptions

Assumptions, though not verified, are beliefs that a researcher has about a study (Locke et al., 2014). In this study, I assumed the following:

1. The participants would provide truthful, honest responses to the interview questions.
2. The participants would have relevant experiences and information.
3. The responses provided by the participants could be used to understand the business strategies some private practicing physicians successfully use to develop or purchase EMR systems conforming to CMS guidelines under the QPP directive.
4. The participants have implemented EMR systems that conform to CMS guidelines under the QPP directive.

Limitations

Limitations are possible weaknesses that are beyond the researcher's control (Singh, 2015). One of the limitations of this study was that the participants were employed as private practicing physicians. Restricting the study population to private practicing physicians may have limited the transferability of the methods used in my study for future research. Another limitation was that I conducted the member checking via telephone calls or by emails due to COVID-19.

Delimitations

Delimitations are boundaries intentionally established to narrow the scope of a study for the researcher (Holloway & Galvin, 2016). The scope of my study will be limited to physicians employed as a private practicing physician. Additionally, a purposeful sampling will be conducted to select the physicians associated with the development and implementation of EMR systems that conform to CMS guidelines under the QPP directive will be interviewed for this study. For the purpose of this case study, any potential participants who do not work in a private capacity will not be eligible.

Significance of the Study

Contribution to Business Practice

Even as the implementation of EMRs is complete in healthcare facilities, paper use persists, suggesting that the EMR may not adequately support clinical workflow (Russ et al., 2010). Information technology (IT) benefits usually need to relate to profitability and quality in an organization (Kasiri et al., 2012). Medicaid and Medicare officials play a significant role in U.S. healthcare (Bradbury, 2015). Nonetheless, access to these officials and healthcare providers has been and continues to be a challenge for Medicaid and Medicare beneficiaries: patients (Bradbury, 2015). Exacerbating the issue is the recent expansion of insurance coverage under the Affordable Care Act (ACA) (Bradbury, 2015). With significant study outcomes, medical students, nurses, and physicians may benefit from applying study findings because they will be implementors of their own systems.

Implications for Social Change

The purpose of this study was to identify strategies that physicians use while maintaining a successful private practice without compromising value-based patient care as outlined by the QPP under the CMS. Physician behavior is vital as physicians possess great, if not the greatest, influence on the United States healthcare cost, quality, and access (Bradbury, 2015). Since the change of charting medical records for patient encounters, there have been efforts on both the healthcare provider and administrative sides to improve patient care without increasing costs. While studying the strategies physicians in private practices are implementing and developing for EMR systems, I established themes and strategies that can be readily understood. Through the research and findings of this case study, my goal is to implement positive social change and improve human or social conditions by improving the healthcare worth, dignity, and development of individuals, families, and communities.

A Review of the Professional and Academic Literature

The purpose of this qualitative multiple case study was to explore strategies that some physicians used to follow MU guidelines to implement EMR systems under the QPP directive. In the completion of the case study, I used numerous peers reviewed articles from various sources. Each of the studied articles was relevant to understanding how private practicing physicians use EMR systems that conform to CMS guidelines under the QPP directive. I divided the literature review to summarize the articles and the necessity for each article in private practicing healthcare physicians' chosen organizations. In my review of the literature, the sections are CAS theory, health care

system in the United States, value-based methodology, MU (Stage 1, 2, and 3 MU), EMR, and the summary. This literature review included 111 references, out of which 111 (100%) were peer-reviewed, and 75% (83/111) were published in or after 2017.

Table 1

Source of Data for Literature Review

	Total	Total Published in or after 2017	% Published in or after 2017
Peer-Reviewed Journals	111	83	75%
Non-Peer-Reviewed Journals	0	0	0%
Books	0	0	0%
Total	111	83	75%

Note. Table is created based off the references presented throughout this section.

Complex Adaptive Systems Theory (CAS)

The conceptual framework serves as the lens of reviewing the professional and academic literature about the topic (Mason et al., 2017). In this study, I explored the strategies private practicing physicians successfully use to implement EMR systems that conform to CMS guidelines under the QPP directive. To successfully achieve this goal, I selected the CAS as the conceptual framework of my study. The CAS theory addresses and acknowledges that healthcare organizations are dynamic, unpredictable, and unique. Mason et al. (2017) advanced that within complex adaptive systems, homogeneous agents follow the rules governing behavior within a complex, organized system, thus producing an emergent, melodic pattern for the entire system.

In his study of sociodynamics, Weidlich (2003) developed mathematical modeling approaches for understanding the influence of individual actions on social systems' behavior. Complexity is one element of the CAS theory that entails heterogeneity or a variety of components. The term *adaptive* conveys the ability to transform or develop, and the term *system* represents a combination of all elements to form a whole. The healthcare industry embodies the criterion of a complex adaptive system including nonlinear inter, dependencies, self-organization, emergent behaviors, and co-evolutionary systems. Interconnected entities exist within a complex adaptive system, consisting of diverse, independent components behaving according to a specified set of rules requiring modifying individual entity behavior as each reacts to other entities' behavior.

Paina and Peters (2012) suggested applying CAS theory to healthcare issues is beneficial because this methodology may help policy analysts explore innovative approaches for implementing healthcare services for populations in need. Additionally, Boustani et al. (2010) suggested the application of complexity theory principles in healthcare because of the unpredictable nature of the industry when developing and implementing policy changes within medical delivery systems.

Healthcare systems include diverse groups of interconnected actors such as providers, patients, and policymakers that deliver services through many avenues and require adaptability, innovation, and self-learning. Boustani et al. (2010) suggested the current healthcare system is diverse, interdependent, and composed of emergent entities. The behaviors of individual entities continually evolve because of regulation by internal and

external stakeholders. The CAS theory was appropriate for understanding the physician system's various components that must harmonize in a rapidly changing and chaotic environment. The CAS theory outlines an evolutionary physician business model.

According to Wallis (2006), CAS history dates to the early 1990s, and the researchers most frequently cited are Gel-Mann, Holland, and Waldrop. According to Miller and Page (2007), Holland's study *Adaption in Natural and Artificial Systems: An Introductory Analysis with Applications to Biology, Control, and Artificial Intelligence* is the foundation of the CAS study method. Cohesively, an organization's complexity is a combination of when members of the organization's hierarchy provide internal and external inputs and feedback and can create and maintain positive and negative feedback loops to sustain the organization's position in the business world (Davis et al., 2015). Gossett et al. (2019) described how feedback loops could affect the safety and quality of services, healthcare costs, and stakeholder satisfaction in healthcare systems.

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MACRA. For this case study, I used the CAS framework approach to facilitate my understanding of the strategies participants used to implement their EMR systems per the CMS guidelines under the QPP.

Researchers use CAS to talk about the origins of this field of study and assess its success and relevance. Sturmberg et al. (2014) provided a history and overview of General practice/family medicine engaged with the emerging systems and complexity theories in four stages. Before 1995, articles tended to explore traditional phenomenological general practice/family medicine and individual practitioner experiences. Researchers that published articles about the CAS theory between 2000 and 2005 focused on describing medical practice's system dynamics. In 2001, researchers of the Institute of Medicine (IOM) produced a pivotal study (*Crossing the Quality Chasm*) that endorsed the idea of healthcare systems operating as complex adaptive systems (IOM, 2001).

After 2005, authors and researchers increasingly applied the breadth of complex science theories to healthcare, health reform, the future of medicine, and the importance of healthcare information systems. A majority of healthcare change researchers have focused on small-scale initiatives directed by single healthcare organizations or have focused on large-scale transformation (interventions aimed at coordinated, a system-wide change affecting multiple organizations); healthcare research is scant (Best et al., 2016).

The implementation of the ACA prompted healthcare organizations to re-examine the evolving operational landscape. Physicians and managers of hospitals must now conterminously align to sustain change implementation and adapt to new environmental

contexts and changing government requirements (Best et al., 2016). For analyzing the data collected in this study to explore the strategies private practicing physicians use to utilize EMR systems conforming to the CMS guidelines under the QPP directive, the CAS theory is appropriate. Gossett et al. (2019) described that the feedback loops could affect the safety and quality of services, healthcare costs, and stakeholder satisfaction in healthcare systems. Moreover, physicians can maintain their practices either as a sole proprietor or join a small or large group of physicians instead of becoming a hospitalist.

CAS covers the development of complexity theory as a field of study. Researchers have used complexity theory to analyze complex healthcare systems on a surface level and understand their structure and behavior (Mahajan et al., 2017). However, a complex system is characterized by emergent behavior that does not depend on its parts but on its relationships to one another, resulting from their interaction in feedback among its parts (Gossett et al., 2019). Therefore, the complexity theory is the foundation of how systems function in the modern world today. The CAS explores identifying and analyzing emergent behavior that depends not on its parts but the whole. Researchers are concerned with the idea that a system is more than just assembling a set of machines or parts of machines. To deal with complex systems, researchers use abstractions and rely heavily on computer simulations to derive information about the system and what needs to be done to enable system changes. Complexity theory has an enormous scope of application in today's environments, mainly because real-world systems are intricate (Elia et al., 2020). However, while using the CAS theory,

researchers create visualizations of how these systems work in real-life settings by achieving equilibrium and fulfilling their reporting requirements.

Healthcare System in the United States

The United States healthcare system grew out of the Progressive Era in the early 1900s with President Theodore Roosevelt's support for a national medical program (Orentlicher, 2012). After decades of attempts to pass a nationalized healthcare program, President Lyndon Johnson was able to sign the Social Security Amendment into law in 1965, creating Medicare, America's first federal healthcare program (Hariri et al., 2007). The original Medicare legislation consisted of three parts: the Cohen-Falk bill became Medicare Part A, the Republican proposal became Part B, and the American Medical Associations' proposal of providing medical coverage for children and disabled individuals under age 65 became Medicaid (Orentlicher, 2012). Originally consisting of two types of coverage, Part A for hospital care and Part B for physician care, Congress also created Part C under the Balanced Budget Act of 1997 (Hariri et al., 2007). Part C or Medicare Advantage Plans are replacement plans for Medicare through private insurance companies offering Part A, Part B, and additional coverage for vision, dental, and hearing (Hariri et al., 2007). Legislation regarding the Medicare Prescription Drug Improvement and Modernization Act of 2003 (Medicare Part D) provided prescription drug coverage for seniors and individuals with disabilities (Hariri et al., 2007).

The United States healthcare system remains inefficient because of rising costs, access barriers, lack of patient coordination, and medical errors (Swensen et al., 2014). Gossett et al. (2019) used CAS theory to identify independent variables that were related

to access issues. Additionally, Gossett et al. (2019) further identified safety, quality, cost considerations, and stakeholder satisfaction. Upon identifying these considerations, Gossett et al. (2019) grouped these concerns as directly or inversely related to one another. Through this process, Gossett et al. (2019) outlined why the U.S. healthcare system has the problems of inefficiency, ineffectiveness, excessively costly, and low satisfaction in the delivery of healthcare services. Gossett et al. (2019) used evidence-based practices to address the identified recommendations to improve safety and quality, bend the cost curve, and increase stakeholder satisfaction.

The traditional healthcare management system has used paper-based medical records to detail and store a patient's personal information, medical history, chief complaint, outcome, and follow-up (Ducey & Coovert, 2016). Healthcare professionals used handwritten documentation to keep track of patients' data for many years. Howard et al. (2012) reported that healthcare workers documented and used paper-based records because of low implementation costs and widespread acceptance. The data collected were useful to increase care quality and increase physicians' and staff's knowledge. The disadvantages of using a paper-based medical records system are (a) doctors may not engage patients over concerns of a potential increase in workload, (b) patients may not understand health record information, and (c) frequent illegibility (Hsiao et al., 2013). Paper-based systems for information storage and retrieval could have high failure rates that might lead to duplication of service, delays in treatment, and increased risk of medical errors because leaders do not yet understand how to best design, implement, and use electronic health information technology (Rippen et al., 2013).

Nguyen et al. (2014) demonstrated that technology is vital to revealing medical practices and hospital administration competencies. Like other service-related industries, the healthcare system depends on information technology to provide efficient delivery of services even with limited staff and resources (Jones et al., 2014). Therefore, more improved innovations and systems provide optimum service outcomes (Ducey & Coovert, 2016). The innovative technologies that offer service efficiency in the healthcare facility include EMR systems, computerized physician order entry systems, and the hospital information system. Such innovations provide an information system that healthcare providers use to provide a medical diagnosis in a paperless forum (Ducey & Coovert, 2016).

Nguyen et al. (2014) reported that hospital information systems and EMR are prerequisites for the efficient delivery of high-quality healthcare in hospitals. EMRs are convenient, portable, and efficient; reduce clerical records; and support automated decisions. The purpose of EHRs is to document and communicate patient information and conditions between the interdisciplinary team within and outside an organization (Mandl et al., 2014) and improve care quality (Nguyen et al., 2014). Singh and Sittig (2016) stated the EMR is an enabling technology that physician practices use to pursue MU tools, significantly improving patient and provider convenience compared with paper-based records. EMR systems have improved quality, efficiency, and patient-centered care among healthcare facilities (Koh et al., 2013). Presidents Bush and Obama supported the goal of increasing the use of technology and implementing EMR systems (Clarke & Hulatt, 2014).

Value-Based Methodology

Value is a nebulous concept and depends upon whose definition of value the concept affects. Porter (2010) noted that healthcare value should encompass a performance framework for improvement and includes outcomes relative to cost. However, cost reduction without regard to outcomes achieved leads to limitations in efficient and effective care. Lee et al. (2012) surmised the redesign of care delivery should include more than reducing physician reimbursement while defining the value of care from the patient perspective. Lee et al. (2012) further suggested that the patient perspective centers upon outcomes relevant to patients, the costs to achieve these outcomes, and how the healthcare culture defines, measures, and improves value. Measuring value should include all activities across patient care continuums that meet patient needs, much like a traditional value chain. A patient's disease process, an interrelated set of conditions treated through the integration and provision of secondary or complicating disease processes, determines patient medical needs (Porter, 2010). Therefore, treatment for a disease process may involve numerous specialties and interventions. Creating value for the patient through a provider team's combined efforts throughout a patient care cycle or value chain is an example of a value-based approach to care.

The value-based approach resembles a high-performance system approach that involves physicians as team leaders and incentivizes quality delivery. Sood et al. (2011) suggested moving to a value-based model as a prospective payment methodology would focus upon reimbursement for broader service units, such as episodes of care or care

needed over time that incorporates quality and value into provider payment. Lee et al. (2012) surmised that redesigning care to reflect a high-value care approach becomes synonymous with detailed planning for patient needs, commitment to measuring outcomes, and an unwavering desire to improve. A value-based approach requires medical teams responsible for providing high-value care for patient populations.

Meaningful Use

MU is the standard healthcare provider, and hospitals must meet (Adler-Milstein & Jha, 2017; Alammari et al., 2021). MU illuminated health information technology, demonstrating what strategies doctors and healing centers could utilize to enhance patient care quality, well-being, and effectiveness (Adler-Milstein & Jha, 2017). The United States government outlined 14 centered goals that doctor's facilities must meet to receive incentives. Notwithstanding the 14 centered targets, hospital leaders also needed to select 5 of 10 additional metrics (Adler-Milstein & Jha, 2017).

MU is a three-stage framework created to make modern EMR use work more effectively (Weiss & Nunes Amaral, 2013). Stage one of MU gathered information; stage two was expanding coordination of care, and stage three enhanced patient results (Weiss & Nunes Amaral, 2013). Singh and Sittig (2016) countered the objectives of the three stages of MU as:

1. Tending to safety concerns exclusive to EMR innovation,
2. Alleviating safety issues emerging from utilizing EMR inaccurately, and
3. Adopting a framework for observing and enhancing patient safety electronically.

Without MU, the ACA developers gambled, boosting volume over results (Weiss & Nunes Amaral, 2013). More than half of suppliers and 80% of acute care facilities gained impetus installments and ended up becoming MU clients (Weiss & Nunes Amaral, 2013). Government strategy administrators utilized scientific research revealing the utilization of electronic means to enhance the nature of healthcare services (Adler-Milstein & Jha, 2017). According to Adler-Milstein and Jha (2017), healthcare interoperability was focused on getting EMR systems to work together. Adler-Milstein and Jha (2017) purported that consolidating interoperability with the enhanced nature of care brought about lessened medicinal services costs. Notwithstanding, the healthcare workers were impervious to sharing patient data, and interoperability advanced gradually (Weiss & Nunes Amaral, 2013).

Adler-Milstein and Jha (2017) used data collected by the American Hospital Association surveying 4,493 acute care nonfederal hospitals to answer hospitals and the MU criteria. MU regulations require collecting demographic information, such as age, sex, race or ethnicity, and preferred language. Most hospitals with health information technology systems did not collect such demographics before the HITECH Act. Only 11.9% of hospitals had health information technology in 2009 (Adler-Milstein & Jha, 2017). The Medicare and Medicaid MU programs also contained an incentive process, including eligible providers or both programs. Qualified providers for Medicare incentives included physicians of medicine or osteopathy, dental surgery or medicine, podiatric medicine, optometry, and chiropractic medicine (U.S. Centers for Medicare & Medicaid Services, 2017). Eligible providers for Medicaid incentives included

physicians, nurse practitioners, certified nurse midwives, dentists, and physician assistants in physician practices. Providers cannot be in both programs.

The Center for Medicare and Medicaid Services is responsible for the Medicare MU program for eligible providers with the maximum incentive amount of $44,000 over 5 consecutive years. Providers must disclose MU every year to receive incentive payments. Financial penalties for failure to achieve the MU standards by 2015 would be applied to providers (King et al., 2014; U.S. Centers for Medicare & Medicaid Services, 2017). The maximum incentive amount was $63,750 with payments over 6 years, which are not consecutive. Providers could receive an incentive payment for adopting, implementing, or upgrading EMR technology (King et al., 2014). King et al. (2014) asserted that providers had to demonstrate MU use in the remaining years to receive incentive payments. The MU program included three stages. The first stage focused on the EMR incentive programs by establishing requirements for the electronic capture of clinical data (Partridge et al., 2017). Stage one MU began in 2011 and ended in 2013. The requirements for stage one were eligible providers that have achieved 15 core objectives and five of 10 menu objectives.

Stage 1 Meaningful Use

Providers who began the MU attestation process in 2011 began to attest for Stage 2 of the program in 2014. Whereas the focus of Stage 1 was adoption, Stage 2 focused on interoperability and health information exchange. New requirements centered around engaging patients through online portals. To successfully attest for Stage 2, at least 5% of patients must view, download, or transmit health information via an approved patient portal. EMR vendors, however, struggled to update their systems for this change. Coupled with the now-delayed release of ICD-10 in October 2014, the CMS decided to shorten the 2014 reporting period for Stage 2 from 365 days to 90 days and allow providers to use un-certified EMRs to re-attest under Stage 1 rules. Despite this restructuring, participation and payments fell precipitously from 2013 to 2014.

Unique EPs receiving payments in 2014 fell nearly 70% to 97,049, and exceptional hospitals receiving payments fell almost 15% to 3,590. By the end of 2014, 438,332 unique providers and hospitals had received $29.58 billion in revenues — around 82% of the initial $36 billion allocated. As the MU incentive program continued, the question became – will provider attrition slow, increase, or continue at its current pace? According to a 2014 Medscape survey, 22% of providers abandoned or never participated in the program. That does not quite sync with the numbers outlined above — particularly the fall from 2013-to 2014. As 75% of EPs have not yet attested for Stage 1, reimbursement penalties begin this year at 1%, and reductions could rise to 5% by 2018.

Stage 2 Meaningful Use

The second stage of MU included criteria that focused on ensuring the MU of EMR systems and electronic information exchange in the most organized format (Shrestha et al., 2016). The third stage focused on improving quality, safety, and efficiency leading to improved health outcomes (Shrestha et al., 2016). The synergy between information technology and medical services was designed to advance coordinated care and healthcare system performance possibilities. However, the use of EMR in the United States and the computerization of information in many other sectors of the economy were delayed (Adler-Milstein et al., 2015). Billing mechanisms were first to change to an electronic platform in healthcare. Middleton et al. (2013) had suggested that universal electronic systems could improve care by allowing medical facilities to compare information, leading to improved care and a more communicative dialog that might benefit patients. Some common medical errors were adverse drug events, improper transfusions, surgical injuries, mistaken patient identities, order entry and transcription, and death (Middleton et al., 2013). Medical errors cause a loss of trust in patients' healthcare system and diminished satisfaction by patients and health professionals.

EMR was noted as an electronic record of patient health information and demographics generated by one or more encounters in any care delivery setting. Pawar and Chakravarthy (2014) stated that EMR information included patient demographics, progress notes, problems, medication, vital signs, past medical history, immunizations, laboratory data, radiology reports, and billing systems. The authors reported the EMR automates and streamlines the clinician's workflow and can generate a complete record

of a clinical patient encounter (Pawar & Chakravarthy, 2014). The EMR was a digital version of the patient's medical history. Medical professionals understand how IT affects the documentation and security of medical data, patient information, and the potential privacy infringement (Chen & Xu, 2013). Understanding medical IT processes were designed to improve medical data quality and medical care quality (Chen & Xu, 2013). This study applied to all healthcare businesses, such as hospitals, small and large medical practices, nursing homes, assisted care facilities, behavioral medicine facilities, nursing schools, medical schools, and technical schools.

For 2017, EPs may choose to attest to either Modified Stage 2 or Stage 3. The reporting period is again a full calendar year for those who decide to continue with Stage 2. For those who choose to attest to Stage 3 instead, the reporting period is 90 consecutive days. If affirming for the first time in 2017, the reporting period is 90 consecutive days for attesting to either Stage 2 or 3, and some of the measure thresholds for Stage 2 are higher than Stage 3. For example, EPs are again required to have at least 5% of unique patients' views, download, or transmit their health information electronically. Additionally, 5% of patients must use secure messaging with their physician. Also, EPs must attest to two public health reporting measures; alternate exclusions are not available. As for certified EMR technology (CEMRT), EPs can use a 2014 edition CEMRT to attest to Stage 2. They can also use either a 2015 edition CEMRT or 2014 and 2015 editions to attest to Stage 2 or 3.

Objectives	**Measures**
Protect patient health information	Conduct or review a security risk analysis, implement security updates as necessary, and correct identified security

Objectives	Measures
	deficiencies. Also, ensure data is stored according to encryption/storage of data regulations.
Electronic prescribing	Query for a drug formulary and transmit electronically more than 60% of all permissible prescriptions.
Clinical decision support	Implement five clinical decision support interventions related to four or more clinical quality measures. Absent four clinical quality measures related to scope of practice or patient population; interventions must be related to high-priority health conditions.
	Enable functionality for drug-drug and drug-allergy interaction checks.
Computerized provider order entry (CPOE)	Record more than 60% of medication orders, more than 60% of laboratory orders, and more than 60% of diagnostic imaging orders using CPOE.
Patient electronic access	Provide to more than 80% of all patients timely electronic access to view, download, and transmit to a third party their health information. Access can be provided through a patient portal or other compatible electronic application of the patient's choice.
	Send patient-specific education resources to more than 35% of all patients.
Coordination of care through patient engagement	More than 10% of all patients must view, download, or transmit to a third party their health information or otherwise access their health information. This can be performed through a patient portal or other compatible electronic application of the patient's choice.
	More than 25% of all patients must send a secure message electronically.
	Incorporate patient-generated data or data from a non-clinical setting into the electronic medical records of more than five patients.
Health information exchange	Provide and electronically transmit a summary of care record for more than 50% of patient referrals or transitions of care.
	Retrieve and incorporate into a patient's record an electronic summary of care document for more than 40% of transitions or referrals received or patient encounters where the physician has never before encountered the patient.
	Perform clinical information reconciliation for more than 80% of transitions or referrals received or patient encounters where the physician has never before encountered the patient.
	Meet three of five requirements:

Objectives	Measures
Public health and clinical data registry reporting	1. Actively engage with a public health agency to submit immunization data. 2. Actively engage with a public health agency to submit syndromic surveillance data. 3. Actively engage with a public health agency to submit case reports of reportable conditions. 4. Actively engage with a public health agency to submit cancer data or health surveys. 5. Actively engage with a specialized registry to submit clinical data.

Note. Adapted from the AAFP; Waldren and Solis (2016,).

Although Stage 3 is intended to be the final MU stage, it is not the final chapter. Stage 3 is broken into the Medicare Access and CHIP Reauthorization Act (MACRA) that rolls the MU program, the Physicians' Quality Reporting System, and the value-based payment modifier program into a new program known as the Merit-Based Incentive Payment System (MIPS). Part of the program's scoring is tied to EPs using certified EMR technology and attaining MU. Patient safety and healthcare quality, medical errors, and adverse effects are still numerous in clinical practice (Yaprak & Intepeler, 2015). As Yaprak and Intepeler (2015) reported, there is difficulty to identify a consistent estimate of errors but understanding the significant causes for medical errors and discovering effective interventions to decrease them is fundamental to enhancing patient safety and quality of services. Safety culture is becoming a significant concern for healthcare organizations striving to enhance patient safety, and some safety assessments have pointed out that organizations need a culture change to facilitate an environment of

quality care. Safety culture has become a crucial concern for healthcare organizations that strive to enhance patient safety (Yaprak & Intepeler, 2015).

Patient safety risks.

Alotaibi and Federico (2017) defined patient safety as preventing adverse injuries in healthcare processes. As Alotaibi and Federico (2017) reported, the electronic physician's orders without clinical decision support do not seem to reduce medical errors or improve overall patient safety. Their study found that the ordering physicians ignored 33% of 18,115 drug alerts in the Boston area (Alotaibi & Federico, 2017). Likewise, Amato et al. (2017) discussed that the most frequent issues were orders not routed at the intended location, wrong doses, and duplicate orders. For instance, when the nurse failed to follow established procedures, like providing vaccines, the order was sent to the outpatient pharmacy instead of the clinic stock supply (Amato et al., 2017).

Electronic Medical Record (EMR)

Healthcare Organizations and Strategies.

EMRs are widespread in the US, as they are widely utilized in clinics, hospitals, and across medical practices nationwide. This is due to the provision of the American Recovery and Reinvestment Act of 2009, which mandated the use of EHRs across all healthcare organizations in the US by 2015 (Balestra, 2017; Barrett, 2018; Barrett & Stephens, 2017). Failure to comply with this mandate could result in medical reimbursement penalties, and these penalties increase with each year of noncompliance (Barrett, 2018). As a result of the ACA's passing, there has been an increase in the usage of EMRs. With the increased prevalence of EHRs, strategies are needed to ensure EMR

adoption effectiveness (Balestra, 2017). Several authors have called out the need for strategies relating to the use of EMR systems, as current issues face EMR use in healthcare settings, including the time-consuming nature of EMR, diminished patient interactions, and medical errors (Balestra, 2017; Mosaly et al., 2017). The application of these strategies is essential for optimal benefits from implementing EMR systems across healthcare settings (Longhurst et al., 2019).

Outlining strategies for using EMR systems could help address these issues and ensure the increased quality of patient care, increased efficiency, improved physician wellbeing outcomes, and overall reduced costs. Researchers have noted that strategies for using EMR systems need to be standardized across healthcare professions, supporting patient-physician communication, interprofessional communication in healthcare, and patient care outcomes (Balestra, 2017; Bardach et al., 2017;). Barrett and Stephens (2017) and Adeyemi (2017) similarly called out the need for strategies to ensure EMR implementation success and lower resistance to EMR change among healthcare practitioners and physicians. Barrett and Stephens (2017), for one, noted that strategies related to engagement of employees and overall satisfaction need to be considered when implementing systems of EMR to ensure its effectiveness within healthcare communicative processes. This pool of findings could be used to obtain initial empirical information corroborating the need for EMR implementation strategies in healthcare organizations to ensure their effectiveness. Addressing the need for strategies that physicians and healthcare practitioners can implement could result in efficient navigation and utilization of EHRs within healthcare systems in the US, positively impacting patient

care outcomes and physician wellbeing outcomes (Dening et al., 2019; Galen et al., 2019).

Physicians in the use of EHRs face various challenges. Researchers have shown that physicians struggle with productivity and usability in EMR systems (Hribar et al., 2018; Matthews, 2017). Matthews (2017) noted that despite the rapid rates of EMR documentation implementation, more meaningful strategies are needed to address the need for physicians' efficiency. This is especially true given the fact that physicians have a wide range of responsibilities, which add to their workload, in addition to EMR-related tasks (Arndt et al., 2017; Gardner et al., 2019). Matthews (2017) explored this topic among 37 behavioral health providers using EHRs during face-to-face patient visits. Through the findings, the researcher showed that environmental, relational, and system-related strategies are needed to efficiently implement and integrate EHRs into healthcare systems, especially during treatment and face-to-face patient encounters (Matthews, 2017). Similarly, Hribar et al., (2018) underscored that EMR documentation practices and strategies in the outpatient setting need to be further reviewed. In the outpatient setting, physicians report a low number and percentage of notes reviewed, indicating that a large percentage of content in the EMR is not being utilized by clinicians (Hribar et al., 2018). These researchers, however, did not explore and determine which specific strategies for EMR documentation are best for addressing the needs of both physicians and patients. Thus, this pool of information can be interpreted as a call for the need for further exploring of documentation practices and strategies, as this could help yield better EMR designs and improved information concerning the needs of both physicians and

patients. As such, these findings could be used to demonstrate the need for the current study in exploring strategies for applying electronic medical records to improve patient care and increase profitability.

The use of strategies that are consistent and standardized is vital to the effectiveness of EMR documentation. According to Cohen et al., (2019), when the EMR documentation process varies from one physician to another, patients' negative clinical status might occur, which is harmful to the patient outcomes. Several authors explored this topic further and aimed to analyze variations of EMR documentation strategies (Cohen et al., 2019; Friedman & Banegas, 2018). Friedman and Banegas (2018) also underscored the need for more standardized strategies in healthcare systems. The authors noted that an integrated healthcare delivery system, specifically for EMR, is vital in addressing patients' social determinants of health and outcomes (Friedman & Banegas, 2018). Thus, the authors concluded the need to develop further and provide electronic medical record-based tools that are standardized, providing measurable and actionable patient data that could be utilized to address our patients' identified needs (Friedman & Banegas, 2018).

Key performance indicator (KPI) dashboards are also used to enable the standardization of procedures and processes in healthcare to obtain more efficiency and transparency across the organization (El Morr & Ali-Hassan, 2019). KPI is differentiated from Balanced Scorecards as the latter is used to assess performance metrics over more extensive time periods of quarters, months, and weeks. KPI dashboards, on the contrary, are used for tracking performance in smaller periods of days, hours, and minutes (Nassar

et al., 2015). KPI dashboards are used as strategic indicators concerning the status of a process and as opposed to Balanced Scorecards, focus on trend lines rather than movement towards goals already specified. Business intelligence systems at healthcare organizations generate dashboards that administrators use at hospitals to obtain data regarding several KPIs from different sources at the organization to attain a more comprehensive understanding of the organization's processes (Mariani et al., 2016). Through the aggregation of data, users can attain efficiency at their organizations via a real-time snapshot of the hospital's performance and understanding of actions taken proactively (Mariani et al., 2016). Further, administrators to focus on specific KPI information to trace and remove the fundamental hurdles resulting in inefficiency performance (El Morr & Ali-Hassan, 2019).

KPIs can be divided into multiple types, including clinical, operational, and financial (Cruz Villazón et al., 2020). Operation type of KPIs affects productivity among employees and performance among patients (Cruz Villazón et al., 2020). Some of the KPIs within this type include medication errors, patient wait times, average length of stay, and asset utilization rate (Cruz Villazón et al., 2020). The financial type of KPI affects both the bottom and top line. KPIs within this type include payor performance, physician performance, hospital performance, referrals to outside centers, the expense incurred by hospitals, and physician performance (Cruz Villazón et al., 2020). Effective KPI dashboards enable performance tracking by providing real-time access to dashboards that are rich in information from multiple hospital departments and are accompanied by functionalities for escalation and support for decision (Cruz Villazón et al., 2020).

Process mapping is another tool that managers can use in organizations for improving quality. A process map consists of a diagrammatic representation regarding the action sequences for a particular activity (Heher & Chen, 2017). Through the use of a process map, users can visualize and explain the steps that are part of a process. Process maps consist of symbols, which can denote different elements depending on their shapes (Heher & Chen, 2017). Endpoints and starting points are represented through oval shapes, while actions are represented through rectangle shapes (Heher & Chen, 2017). Waiting is represented through inverted triangles, while decision points are represented through diamonds (Heher & Chen, 2017). Arrows and lines link symbols, helping highlight the direction and interaction of the processes (Heher & Chen, 2017).

In healthcare, process mapping is a tool for improving operational efficiency and quality of healthcare (Heher & Chen, 2017). The advantages of using a process map are multiple. Process mapping helps avoid the challenges related to redesigning and workflow analysis associated with standard operating procedures generated in the format of narratives (Heher & Chen, 2017). In this regard, process mapping helps understand processes rapidly and efficiently through visualization, as graphs register more rapidly in the human mind than written and oral formats (Heher & Chen, 2017). Additionally, as a hospital consists of various departments, process mapping allows integration across different team members via visual diagrams (Heher & Chen, 2017). Limitations associated with existing workflow, identified through process mapping, help deploy interventions quickly (Heher & Chen, 2017). Without easy measurement, no process can be improved. The process of developing process maps requires brainstorming between

different members of the organization, which results in consensus building (Heher & Chen, 2017). By availing these advantages, process mapping has become an essential part of quality improvement at hospitals.

Lean Six Sigma is another process used in the healthcare industry to improve operations (Improta et al., 2019). Lean Six Sigma is a system driven by metrics utilized to remove defects and decrease medical errors from care delivery processes. Lean Six Sigma is used to make operations efficient and enhance customer value (Henrique & Godinho Filho, 2018). Lean Six Sigma consists of Lean, focused on removing waste, and Six Sigma focused on decreasing variation by reducing defects in line with a particular statistical measure (Antony et al., 2018). Lean Six Sigma is thus a combination of two systems to achieve a single improvement process for organizations (Improta, et al., 2019). The Lean Six Sigma consists of a five-step approach for improving processes, namely Define-Measure-Analyze-Improve-Control (DMAIC). Through its implementation, eight wastes are eliminated as part of the Lean process (Improta et al., 2019). These include the reduction of idle time, which is the time a patient or worker has to spend waiting, including the following:

1. Patients waiting in waiting areas,
2. Latecomers stalling meetings, and
3. Waiting lists for an appointment.

The second waste is related to inventory (Henrique & Godinho Filho, 2018). Examples include surplus medications and supplies, extraneous data, and superfluous equipment. Another waste is defects that need to be removed to improve care quality.

These include medical mistakes, system failures, and misdiagnosis (Improta et al., 2019). Another waste is transportation (Henrique & Godinho Filho, 2018). These include reducing the patient, equipment, and supply movement. Another waste to reduce is related to motion, which occurs when workers carry out movements that do not add value to customers. Examples include frequently stopping for equipment and supplies (Improta et al., 2019). Another waste is related to overproduction (Antony et al., 2018). These include developing medications for a patient who has been discharged, duplicate tests, and overextended stays at the hospital. Overprocessing is another waste (Antony et al., 2018). Examples include tests that are not needed and filling of forms containing duplicate data. The Six Sigma that reduces variation includes always focusing on the patient, understanding how work occurs, ensuring processes flow, decreasing waste, focusing on value, and preventing defects by eliminating variation, collaboration, and systematization of efforts (Improta et al., 2019).

Cohen et al. (2019) aimed to determine the causes and effects of variation and strategies of EMR documentation to mitigate adverse effects. The study's authors conducted a sequential, explanatory, mixed-methods study, using semistructured interviews among 40 physicians. After conducting multilevel linear regression analysis, they showed that documentation strategies varied in terms of discussing results, assessment and diagnosis, problem list, review of systems, and social history (Cohen et al., 2019). These variations were due to the varying user preferences of EMR systems and designs. They also showed that variations of documentation were due to the option of multiple places to record similar information (Cohen et al., 2019). This resulted in

documentation inefficiencies and an increased risk of patient harm due to inaccurate or misinterpreted information (Cohen et al., 2019). This body of findings can be used to underscore the need for more standardized strategies for EMR systems and designs, which could help decrease the risk of patient harm.

Other researchers have underscored the need for improved EMR documentation through standardization and training. Cromwell et al. (2018) concurred with the findings of Cohen et al. (2019) and Friedman and Banegas (2018), as the authors conducted a retrospective study intending to improve postoperative documentation through standardization. In their study, data were gathered from 100 patients who underwent recent surgery in the past five weeks; wherein, the authors developed an educational tool to improve postoperative documentation (Cromwell et al., 2018). After the standardized postoperative documentation plans were in place, the researchers reported significant improvements in the quality of postoperative surgical documentation (Cromwell et al., 2018). Specifically, all documentation standards improved quality of documentation for patient identification (17.8% vs 78.1%, $p < 0.001$) and name of note maker (54.7% vs 86.2%, $p < 0.001$) (Cromwell et al., 2018). In the results, the researchers also showed significant improvements in the documentation quality of antibiotic use (23.8% vs 75.8%, $p > 0.001$), thromboprophylaxis (7.1% vs 75.8%, $p < 0.001$), analgesia (36.9% vs 74.7%, $p < 0.001$), operative diagnosis (66.6% vs 91.9%, $p < 0.001$), and mobilization (23.6% vs 78.1%, $p < 0.001$) (Cromwell et al., 2018).

Gold et al. (2017) further concurred, investigating the EMR-related strategies centered on enhancing patients' social determinants of health. Like past authors, Gold et

al. (2017) noted that substantial health benefits could only be found by developing EMR-based tools that are standardized. With a focus on standardized data collection and presentation, the authors collaborated with 27 stakeholders to develop strategies for optimizing data collection and presentation in their EMR (Gold et al., 2017). In the findings of their study, the researchers showed that providing standardizing SDH data collection and presentation in EHRs leads to significant quality improvements of data collection and patient and population health outcomes in healthcare settings (Gold et al., 2017). These findings can further be used to highlight the need for standardized documentation strategies and educational training for physicians as users of such documentation tools and strategies (Cohen et al., 2019; Cromwell et al., 2018; Gold et al., 2017). Overall, there is a need that strategies for EMR documentation and implementation are facilitated to focus on user training during implementation stages and documentation standardization (Liou et al., 2017; Tisherman et al., 2018).

As a strategy to enhance electronic medical record documentation, the pre-visit planning framework has been proposed as an effective way to enhance outpatient care and quality. Authors Lorenzetti et al. (2018) and Bose-Brill et al. (2018) outlined how advance care planning effectively enhances the EMR system, yielding multiple benefits such as less aggressive care and fewer hospitalizations. Lorenzetti et al. (2018) further added to this, noting how pre-planning can help reduce errors and plan for primary care physicians' resource allocation activities. Bose-Brill et al. (2018) further outlined that with the patient portals and EMR systems currently available, advance care planning or pre-visit planning allows physicians to deliver more efficient planning and workflow

focused on enhancing the quality of patient care. In their pilot study, the authors evaluated the results of the pragmatic trial in two clinical sites, one site with the implementation of the strategy/program while the other without. In their study findings, the researchers showed that advance care planning or pre-visit planning enhances the overall quality of advance care planning documentation (Bose-Brill et al., 2018). Their findings further revealed that the clinical site where the intervention was implemented yielded statistically significant increases in new advance care planning documentation rates and quality among patients who engaged in the pre-visit planning interventions (Bose-Brill et al., 2018). Specifically, pre-visit planning increased EMR documentation rates by 105% (Bose-Brill et al., 2018). Among patients aged from 50 to 60 years old, the advance care planning documentation rates increased by 37% (Bose-Brill et al., 2018). These findings were used to highlight the use of advanced care planning pre-visit planning as a strategy for EMR documentation (Bose-Brill et al., 2018; Lorenzetti et al., 2018). This body of knowledge can be used to obtain initial empirical knowledge regarding the impact of advance care planning delivery in enhancing patient care quality. More research is required as to the impact of this strategy on physicians' workload and efficiency, and face-to-face patient care time (Murphy et al., 2020).

Goal-directed EMR systems, such as the Balanced Scorecard discussed previously, have been identified as effective strategies for patients and clinicians (Ratnaningrum et al., 2020). Researchers have shown that past EMR systems in place focus on reactive patient care rather than goaldirected EMR documentation (Nagykaldi et al., 2018). Nagykaldi et al. (2018) noted this in their study, highlighting the need for EHRs to facilitate healthcare

focused on patient life and health goals. As such, the authors proposed developing strategies for EMR documentation that reflects the goals of patients and clinicians. The authors found that this focus could be used as a strategy to enhance the quality and strengths of EMR documentation, especially with the use of standardized interface terminology, which is in line with past findings (Cohen et al., 2019; Cromwell et al., 2018). This body of findings further underscores the importance of standardized EMR documentation strategies, especially one that is focused on providing holistic approaches for clinical practice and documentation. This could mitigate the occurrences of variations in EMR documentation processes and practices.

Despite the prevalence of EMR systems in healthcare systems in the US, there is still room for improvement regarding the tasks related to entering information into EMR. Yazdani et al. (2019) and Wiebe et al. (2019) noted that more interventions are needed to enhance EMR documentation. For one, Wiebe et al. (2019) emphasized that EMR documentation is highly variable, often entailing multiple data entries such as medical intervention, outcomes, document type, EMR user, and other variables. This aspect of variability leads to difficulty in using EMR and evaluating the quality and effectiveness of documentation (Kitsos et al., 2019). There is a need for EMR documentation to be standardized and more automated (Wiebe et al., 2019). Yazdani et al. (2019) also underscored this in their study's findings, noting how the process of EMR documentation is time-consuming, which poses a significant challenge for physicians at work. The authors thus proposed the use of automated versions of EMR documentation.

The authors applied the trigram language model to develop a methodology that helps predict the following words while typing free texts (Yazdani et al., 2019). Their study results showed that the time to process documentation reduced after employing the words prediction model (Yazdani et al., 2019). Expressly, in their results, they indicated a reduced time in typing by 33% and reduced time in keystroke by 74% (Yazdani et al., 2019). This strategy could help reduce physicians' work time on EMR-related tasks, providing more time for patient-centered treatment (Wiebe et al., 2019; Yazdani et al., 2019). Hence, this could yield a better EMR system across healthcare clinics, and hospitals in the US geared towards EHRs improvement in documentation and patient care.

Barriers to the Implementation.

Many medical organizations experience barriers during the implementation of EMR systems. One barrier to the successful implementation of an EMR system is a selection of software. Organizational leaders must be cautious when selecting an EMR system to meet the needs of healthcare workers. Numerous vendors are available on the market. Achimugu et al. (2014) revealed all stakeholders and staff should have input into the software selection process. The cost can be a significant barrier to successfully implementing an EMR system. Nationally, EMR systems' implementation could cost between $100 billion and $150 billion and $50 billion per year in operational cost. The start-up cost of implementing an EMR system includes the cost of capital outlay (Fleming et al., 2014). The maintenance cost of EMR includes organizational commitment, control maintenance, support, monitoring, modifying, and upgrading

(Huerta et al., 2016). Some healthcare sector leaders consider the start-up and maintenance costs as barriers to the organization's financial operation (Blumenthal et al., 2014).

An effective EMR system can be used to code encounters properly while the practitioner is documenting the encounter (Scheuner et al., 2017). Electronic health record interventions at the point of care improve documentation of care processes and decrease orders for genetic tests commonly ordered by nongeneticists. The right EMR system will enable the organization to provide in-house billing without outsourcing the process. According to Vawdrey et al. (2014), organizations can save at least the software's cost by completing their billing functions in-house instead of sending them to offshore locations. Another barrier to the successful implementation of an EMR system is training. Proper training is essential for the successful implementation of any EMR system (McGuire, 2019; Stevens et al., 2017) Roth et al. (2016) asserted that the EMR system's success lies behind the clinician's and patient's support. However, one study revealed that physicians believe it is significant to mention they did not receive proper training during their EMR system (Roth et al., 2016). The same researchers believed they did not have enough knowledge to ask appropriate questions. Consequently, the physicians believed their implementation process was dysfunctional and inadequate (Roth et al., 2016).

There are various challenges related to the use of EMR systems. Several researchers have noted that to improve healthcare electronic documentation systems, nurses' attitudes, perceptions, and preferences need to be explored and considered in its

development and implementation (Al-Anazi et al., 2018; Hossain et al., 2019). Al-Anazi et al. (2018) noted this in their study's findings, which were conducted using a descriptive correlational cross-sectional design. The authors gathered data from 117 nurses in a critical care unit (ICU) wherein, semistructured questionnaires were administered (Al-Anazi et al., 2018).

In the study's findings, the researchers showed that the majority of the nurses' attitudes indicated positive feelings towards the use of EMR systems (Al-Anazi et al., 2018). However, the study's nurse respondents reported the need for an improved electronic documentation system that is more efficient (Al-Anazi et al., 2018). These findings can highlight the need for strategies to improve the current EMR systems, which could consequently result in better quality healthcare to patients and improved time management for physicians. Bardach et al., (2017) concurred to these findings by Al-Anazi et al. (2018). Like Al-Anazi et al. (2018), the authors of the study explored healthcare practitioners' perceptions in using electronic medical records. Bardach et al. (2017) explored interprofessional communication, specifically with the presence of EMR systems, through nine focus groups. Like past authors, in their findings, they showed that the presence of EMR systems had decreased interprofessional communication within healthcare professional groups and in-person communication to patients (Arndt et al., 2017; Bardach et al., 2017; Henriksen et al., 2019). These findings can be further showed that participants experienced multiple challenges in the efficient use of EMR systems, such as barriers to communication between specialties and decreased confidence that other healthcare practitioners had received one's notes (Bardach et al., 2017). Other found

challenges were related to limitations in technology such as lack of computer availability, documentation complexity, and slow-moving sign-in procedures (Bardach et al., 2017).

More researchers have noted the need for training to be in place during EMR documentation. The use of targeted pieces of training for users has been found to increase data quality, improve user satisfaction, decrease EMR-use time, and decrease turnaround time on EMR-related tasks (Denton et al., 2018; DiAngi et al., 2019). Hemler et al. (2018), for one, underscored the need for supplemental training for physicians on the use of EMR. The authors found this in their study, aiming to investigate strategies best used for addressing electronic medical record data challenges for quality improvement (Hemler et al., 2018). The authors noted that physicians are less likely to provide accurate clinical performance data without proper EMR usage training. As such, training for physicians as EMR users could help set improvement priorities, guide clinical change, and monitor progress (Hemler et al., 2018; Vehko et al., 2019). Hemler et al. (2018) explored 136 facilitators and found that physicians also face numerous EMR challenges, including lack/inaccurate clinical performance data. In addition to training, facilitators also need to help communicate the practices to EMR users/physicians (Vehko et al., 2019). The findings of Hemler et al. (2018) also concluded these findings, noting the need for facilitators who could help develop EMR strategies to develop physicians' skills as EMR users.

Additionally, DiAngi et al. (2019) conducted a pre-post study to explore the impact of supplemental EMR training on EMR documentation. The authors focused on academic and community practice clinicians, gathering self-reported data regarding

calculated EMR time and vendor-reported metrics (DiAngi et al., 2019). Their study's findings showed that significant increases in clinicians' knowledge of tools in the EMR after training, which increased the efficiency of EMR-use time (DiAngi et al., 2019). The results showed that the most significant improvement after the supplemental EMR training was the controlled workload in the EMR; that is, clinicians could better manage their workload, increasing their knowledge of EMR tools and satisfaction (DiAngi et al., 2019). There is a need for further study regarding the contents of additional EMR training sessions for physicians, especially considering physicians' feedback and user acceptability (DiAngi et al., 2019). This could be used to improve different turnaround times for EMR-related tasks, given a better understanding of the barriers and challenges that physicians face in EMR documentation. The use of these strategies of user training and providing facilitators could help drive quality information and ensure accurate and complete data necessary for improved patient outcomes and physician satisfaction. These challenges of EMR usage need to be addressed, especially regarding the prevalence of resistance to change. Leaving these issues of EMR implementation and usage could result in even more barriers to the practical and timely usage and implementation of EMR systems and effective communication between practitioners (Al-Anazi et al., 2018; Bardach et al., 2017; Samhan & Joshi, 2017). Barrett (2018) concurred, noting that resistance to the mandate of EMR implementation is still prevalent in healthcare systems. Delving further into this topic, the author surveyed 345 employees in a healthcare organization with recent EMR implementation (Barrett, 2018). Through hierarchical regression analyses, the researchers in their findings indicated that the quality

of communication regarding EMR implementation was associated with EMR resistance (Barrett, 2018). Multiple barriers, such as resistance to change, are linked to effective EMR implementation and usage (Barrett, 2018). This pool of findings can be used to underscore the multiple challenges related to the use of EMR systems, including resistance to change (Barrett, 2018). Though EMR systems have presented benefits in inpatient care, it has also contributed to changes in patient-physician interaction and interprofessional communication within healthcare professional groups (Al-Anazi et al., 2018; Bardach et al., 2017; Barrett, 2018). These challenges need to be addressed in light of the use of technology in healthcare settings (Khairat et al., 2018). This could lead to improved patient outcomes and profitability.

Despite the US government mandate for EMR system implementation in 2015, there are still many physicians at primary care practices that have not implemented EHRs. Mason et al. (2017) and Barrett (2018) noted this in their study's findings, reporting that by the end of the 2015 deadline, almost 50% of primary clinics have not implemented a basic EMR system. Mason et al. (2017) explored this topic further and aimed to investigate the barriers to implementing a basic EMR system. More specifically, the authors conducted a phenomenology study to explore rural primary care physicians' and physician assistants' experiences regarding barriers to implementing EHRs (Mason et al., 2017). Through the lens of a complex adaptive systems framework, the authors analyzed collected data from 21 physicians and physician assistants (Mason et al., 2017). In their findings from the interviews, they indicated various barriers and challenges faced by physicians and physician assistants in implementing EHRs: lack of finances for EHRs,

health information exchange problems, lack of knowledge and education, and lack of change management at rural medical practices (Mason et al., 2017). Al-Anazi et al. (2018) added to these findings and noted that training programs and support should be provided for physicians and nurses, specifically focused on computer technology before implementing EHRs. This could help ensure optimal EMR documentation results, improving patient care. This body of findings could provide further empirical insights regarding the challenges and barriers of implementing EMR systems. This could be used to develop effective strategies to promote EHRs, provide education for physicians, and enhance change management plans.

Improper usage of EHRs has been identified as a primary concern. Several authors have underscored the need to provide strategies and improvements on EMR implementations, especially concerning system design and human use (Park et al., 2017; Tubaishat, 2019). For one, Tubaishat (2019) conducted a qualitative exploratory study to explore the impact of EHRs on patient safety, as perceived by nurses. The author of the study employed 17 staff nurses who worked in various units in ten hospitals using EHRs (Tubaishat, 2019). In the findings of their study, they showed that EHRs (directly and indirectly) significantly improved patient safety, as EHRs mitigated medication errors, enhanced data documentation completeness, and improved data sustainability (Tubaishat, 2019). However, some challenges that were raised by nurses using EHRs, the occurrences of data entry errors, technical problems, minimal clinical alerts, and poor use of system communication channels (Tubaishat, 2019). These are vital points to address as they could jeopardize patient safety and outcomes. Park et al. (2017) found similar

findings, as the authors aimed to determine the barriers to electronic medical record implementation.

The authors specifically conducted a comparison between ophthalmology and other surgical specialties in Canada regarding adopting electronic medical records. Through their population-based, cross-sectional study among 1199 surgeons, the researchers showed that there were various barriers to the adoption of electronic medical records utilization: not suitable for the practice of the healthcare professional, too costly, time-consuming, privacy concerns, reliability concerns, and lack of training (Park et al., 2017). This body of findings could be used to provide further knowledge on common barriers experienced by healthcare professionals in the adoption and utilization of EHRs (Park et al., 2017; Tubaishat, 2019). This pool of findings could also be used to outline the multiple challenges and concerns regarding EHRs, as perceived and reported by nurses who utilize the system themselves (Park et al., 2017; Tubaishat, 2019). As such, more efforts need to be made to address these issues through targeted strategies, primarily geared towards the technical education and knowledge of EHRs. Barriers to EHRs as perceived and experienced by healthcare professionals need to be addressed. Barriers that are left unaddressed could limit the effectiveness of EHRs, such as human input errors, leading to decreased patient outcomes.

Poor EMR documentation quality has been raised as a concern in healthcare settings. Several authors have noted the need for improvements that address this barrier of EMR documentation utilization (Lorenzetti et al., 2018; Varela et al., 2019). Varela et al. (2019) noted that multiple factors contribute to poor documentation quality within the

EMR, calling out the need to identify and address these factors. For one, Lorenzetti et al. (2018) noted that physicians are often challenged with time management due to the lack of interventions that aim to address poor EMR documentation quality. The authors of the study conducted a systematic evaluation to assess the effectiveness of approaches to improve physician documentation (Lorenzetti et al., 2018). The authors gathered and analyzed 19 studies related to EMR interventions to improve the quality of physician documentation. In their study findings, the researchers revealed multiple problems related to the use of EMR documentation: lack of audit/feedback, poor dictation, lack of education, lack of pharmacist facilitation, reminders, templates, and multi-pronged interventions (Lorenzetti et al., 2018). There is a need for future research regarding the ways to address the needs of EMR users and enhance the quality of physician documentation (Lorenzetti et al., 2018). Lorenzetti et al., (2018) found that poor EMR documentation quality is raised as one of the barriers to EMR implementation and effectiveness. This could help ensure patient safety and overall increased profit for healthcare organizations, reducing the risk of error and improving communication between patients and healthcare providers.

Barriers to medical practitioners' electronic medical record access can impede their effectiveness in practice. With the increasing prevalence of EHRs in healthcare settings, new graduate healthcare practitioners must know how to access patient data and document and synthesize patient information accurately to plan safe, quality care and mitigate potential errors. Authors have called out the need for introducing electronic medical record access for medical students to prepare them for EMR-related tasks and

responsibilities (Welcher et al., 2018). For example, Welcher et al. (2018) argued the need that future medical practitioners needed experiences in handling documentation tasks and encounters. They are introducing EMR-related tasks within educational programs that could be used to help prepare future students to become competent (Welcher et al., 2018).

The authors further argued that competence in using EHRs is essential to becoming physicians, which can help them provide optimal patient care (Welcher et al., 2018). Other researchers argued that experiences and programs using EHRs should be consistently integrated into the medical school curricula (Stroup et al., 2017). More research is needed to determine students' courses to increase the knowledge of EHRs terms and clinical settings objectively. That is, EMR-related skills should be further objectively evaluated with other clinical skills to assess the impact of EMR-related courses (James et al., 2018; Welcher et al., 2018). However, this set of findings could be used to obtain empirical references regarding the potential effects of providing EMR-related courses in undergraduate programs (Welcher et al., 2018). This could add to future healthcare practitioners' knowledge, which could help ensure ample skills and knowledge regarding EHRs. This could help improve patient care outcomes, as well as profit and measurable outcomes.

Physicians

The EMR related tasks comprise a large percentage of the workload of physicians in hospitals. Researchers have shown that despite the potential benefits of EHRs, policymakers and healthcare leaders need to ensure proper implementation, considering

physicians' usability and experiences (Scheuner et al., 2017). Furthermore, policymakers and healthcare leaders need to acknowledge the negative impacts of EMRs, as healthcare practitioners face challenges in the usage of EMR. For instance, it has been reported that physicians spend at least two hours on EMR related tasks for every hour of direct patient care (Arndt et al., 2017; Ramrakhiani & Shetler, 2019).

Arndt et al. (2017) delved into this topic further among evaluated primary care physicians' workload to determine physicians' allocated time within the EMR. With EMR event log information and time-motion observations, the authors conducted a retrospective cohort study among 142 family medicine physicians. The results of their study showed that primary care physicians spend an average of nearly six hours of an 11.4-hour workday in the EMR every weekday per 1.0 full-time clinical equivalent, which is 4.5 hours during clinic hours and 1.4 hours after clinic hours (Arndt et al., 2017). This body of findings has substantiated initial empirical information regarding the positive and negative impacts of EMR systems in healthcare settings and various clinical environments.

Increased workload.

EMR-related work comprises different types of tasks for physicians. Researchers have found that physicians constantly juggle numerous and various amounts of workload relating to patient care, administrative tasks, and EMR-related tasks (Arndt et al., 2017; Henriksen et al., 2019). Besides face-to-face patient care, primary care physicians also perform various clerical and administrative tasks, including documentation, order entry, billing and coding, and system security (Arndt et al., 2017). The clerical and

administrative tasks comprise almost one-half of the total EMR time, on average. In contrast, inbox management comprises almost one-fourth of the time spent regarding EMR-related tasks (Arndt et al., 2017). Henriksen et al. (2019) added to these findings, analyzing the documentation of EMR related tasks. The authors conducted their study using secondary EMR data, including 123,274 progress notes. Their findings showed that the majority of the EMR data documentation entries were comprised of new patient notes (68%) and return patient notes (83%) (Henriksen et al., 2019). Based on these findings, one can obtain an outline of the tedious tasks required in the EMR data documentation process, which takes up a significant amount of physician working time (Arndt et al., 2017; Henriksen et al., 2019). Using these findings as a reference or baseline, one could develop strategies that could help enhance the process of EMR documentation. Exerting more effort on this topic could have implications for quality of care and patient-provider relationships and improved physician well-being outcomes (Heart et al., 2017).
EMR documentation takes a significant amount of time in healthcare delivery.

Researchers have shown that physicians exert and allocate increasingly long hours and efforts in EMR-related tasks, which diminishes the amount of face-to-face patient care (Tai-Seale et al., 2017; Young et al., 2018). Therefore, researchers have uncovered mixed impacts of EMR on the outcomes of primary healthcare. Tai-Seale et al. (2017) explored this topic further, exploring physician work effort on EMR related tasks. Using patterns of physicians' time allocation over 31 million EHR transactions, the researchers showed that among 471 primary care physicians, 765,129 patients' EHRs were accomplished at an average of 3.1 hours during office hours while allocating a daily

average of 3.2 hours on desktop medicine (Tai-Seale et al., 2017). Activities of EMR documentation include patient communication through a patient portal, replying to patients' online requests, ordering tests, exchanging staff messages, and verifying patients' test results (Tai-Seale et al., 2017). Young et al. (2018) delved into this topic further and observed physicians in a total of 982 visits. The authors aimed to measure factors of total visit time, pre-visit chart time, face-to-face time, non-face time, out-of-hours EMR work time, and total EMR work time (Young et al., 2018). Like the findings of Tai-Seale et al. (2017), Young et al. (2018) found that a significant amount of physicians' time was devoted to EMR work, specifically before entering the room and outside of average clinic operational hours. The increased amount of time allocated to activities of EMR documentation diminishes face-to-face patient care and visits. From this body of literature, one can underscore the conclusion that physicians spend a significant amount of time working in the EMR rather than spending face-to-face time with patients (Tai-Seale et al., 2017; Young et al., 2018). Based on these findings, one can understand the need to provide strategies for EMR-related tasks, which could help improve face-to-face patient care and visits, as well as physician workload.

The increased workload resulting from EMR related tasks of physicians has resulted in decreased productivity. Several authors have noted significant time requirements for electronic medical record use in healthcare settings (Dong, 2018; Read-Brown et al., 2017). Further research has shown that EMR documentation has decreased patient-physician relations (Read-Brown et al., 2017; Zulman, Shah). Read-Brown et al. (2017) noted this in their study's findings, exploring 27 ophthalmologists who used

EMR. The authors measured three activities: EMR use, conversation, and examination. Their findings showed that 6.3 minutes was the average examination time per patient. Out of the 6.3 minutes, 27% of the examination time was allocated to the use of EMR (Read-Brown et al., 2017).

Further, 42% of the examination time was allocated to the conversation, while 31% was allocated to the actual examination (Read-Brown et al., 2017). More importantly, they showed a positive correlation between EMR use and billing level, while a negative correlation was found between EMR use per encounter and clinic volume (Read-Brown et al., 2017). These findings can be used to obtain further empirical insights that EMR use diminishes face-to-face patient care time and results in decreased clinic volume and billing levels, which other authors also found (Jabour, 2020). The authors conducted a time and motion study during office hours and after office hours to explore this topic further among 57 physicians. After a 430-hour observation, they revealed that only 27% of total physicians' work hours were spent on face-to-face patient care during office hours, while 49.2% of total physicians' work hours were allocated to EMR related tasks and clerical desk work (Read-Brown et al., 2017). This disparity in physicians' work hours was similarly found after office hours; that is, physicians often worked one to two hours' worth of time due to EMR related tasks (Read-Brown et al., 2017). These findings can be used to underscore further the disparities in physicians' work hours, which need to be focused on face-to-face patient care. The current time spent on EMR related tasks needs to be addressed and decreased through EMR strategies, which

physicians can use to increase their face-to-face patient care time. These concerns further merit the need for the current study.

Burnout.

Burnout among physicians is increasingly common (Nori et al., 2019). Researchers have shown that physician burnout continues to rise in recent years (Downing et al., 2018; Micek et al., 2020). According to Read-Brown et al. (2017) and Downing et al. (2018), EMRs have various benefits, especially regarding improved patient care. However, the excessive use of EHRs and documentation completion also have adverse effects, specifically among physicians and their well-being (Patel et al., 2020; Payne, 2019; Privitera & Attalah, 2018). Researchers have noted how EMR related tasks have significant impacts on physicians, specifically on their stress levels and overall well-being (Arndt et al., 2017; Downing et al., 2018; Yen et al., 2019). Micek et al. (2020) explored this topic in their study, exploring physician burnout and electronic medical record use timing.

The study aimed to investigate the association between physician burnout and timing of EMR use through an observational cohort study. With cross-sectional and retrospective data, the authors measured burnout levels and EMR time among primary care physicians (Micek et al., 2020). In the findings of their study, they revealed that the use of EMR is statistically significant and associated with burnout, mainly when used during in-clinic sessions (Micek et al., 2020). This pool of findings can be used to present empirical findings regarding the prevalence of burnout among physicians. The use of EMR is statistically associated and implicated as a significant cause of burnout. Burnout

can underscore further the need to provide and develop strategies for EMR tasks, which could diminish the burden and stress levels among physicians. Creating strategies for EMR tasks could potentially reduce burnout among this cohort.

Several authors have noted that EMR use has significantly and negatively impacted the work-life balance and burnout among the physician population (Robertson et al., 2017; Shanafelt et al., 2016). Robertson et al. (2017) explored this topic further and explored the effects of EMR use among primary care residents and teaching physicians. The study's authors surveyed 585 primary care residents and physicians, using logistic regression analysis to analyze the data. Their results revealed that 37% were experiencing burnout, with 75% of participants attributing burnout to the use of EMR (Robertson et al., 2017). The levels of burnout were correlated to the use of the EMR wherein the respondents spent more than six hours every week due to EMR related tasks (Robertson et al., 2017). This is vital to address given that work-life satisfaction also decreases along with burnout due to the use of EMR (Robertson et al., 2017).

In line with the effects of stress and burnout, researchers have also revealed that the use of EMR predicts physicians' frustration levels (Gardner et al., 2019). This is vital to address, given that daily frustration increases the risk of physician burnout by 2.4 times compared to physicians who do not have frustrations regarding the use of EMR (Gardner et al., 2019). These findings can underscore that there is much room for improvement in the use of EMR among physicians, especially given that overall physicians' satisfaction is at a low while burnout rates are at a high with the use of EHRs. Thus, while these benefits the use of EMR, healthcare administrators and leaders need to be mindful of the

negative impacts of excessive EMR use, including adverse effects on physicians' satisfaction and burnout levels.

Physician burnout is also manifested through the prevalence of emotional fatigue. This has resulted in an increasing number of physicians leaving the workforce (Downing et al., 2018; Tran et al., 2019). Therefore, this issue of physician burnout is vital to address. This could present a significant threat to the industry healthcare in ensuring a sufficient number of US professionals. Downing et al. (2018) added that with the rise of EMR adoption in the US, more research is needed to alleviate the risk of physician burnout in the EMR era. Tran et al. (2019) explored this topic further and noted that EMR use is a significant factor that leads to burnout and emotional fatigue among primary care physicians. With significant clinical workloads, the authors argued that primary care physicians need to be supported through the less allocated time of EMR use (Tran et al., 2019). Tran et al. (2019) underscored this in their cross-sectional study, exploring self-reported burnout levels among 107 faculty physicians. The authors found that physicians who spent more time in the EMR had increased risks of burnout.

Their results also revealed that physicians' burnout was associated with EMR use, which increased their overall workload (Tran et al., 2019). Therefore, healthcare leaders and policymakers need to consider physicians' burnout factors, given the significant workload they have daily. These burnout factors include the use of EMR, which can be used to underscore the need for more strategies that physicians can utilize to manage their workload better and mitigate their risks of burnout (Downing et al., 2018; Tran et al., 2019). Physician Stress and burnout are related to the use and adoption of health

information technology in hospitals. Researchers have noted that the use of EMR is also prevalent at home and outside of work hours, which significantly contributes to the stress levels and burnout among physicians (Gardner et al., 2019; Privitera & Attalah, 2018; Ramrakhiani & Shetler, 2019). This topic is vital to address and explore further. In one study by Gardner et al. (2019), 26% of physicians reported burnout while 70% reported EMR-related stress, especially among physicians in primary care-oriented specialties. Gardner et al. (2019) noted this in their study's findings, exploring how health information technology impacts and health information technology burnout among physicians. Employing 4,197 physicians, the authors surveyed the use of health information technology and self-reported burnout (Gardner et al., 2019). Through the findings of their study, they showed that several factors contribute to the stress and burnout of physicians: lack of time for documentation and excessive time spent on the EMR at home (Gardner et al., 2019). The lack of time for documentation increased the likelihood of physician burnout by 2.8 times, while the factor of excessive time spent on the EMR at home increased the likelihood of physician burnout by 1.90 times (Gardner et al., 2019). Privitera and Attalah (2018) noted similarly as the authors explored the use of EMR at home. The authors explored survey answers from 1,048 physicians regarding the time spent using EMR at home. They found that physicians' moderately high to excessive time spent on EHRs significantly increased their odds of job stress by 50% and burnout by 46% (Privitera & Attalah, 2018).

Specifically, tasks related to EMR, such as documentation requirements and completion of recording and phone calls at home, were found to increase physician

burnout risk (Privitera & Attalah, 2018). This pool of knowledge can be used to underscore the need to address the issue of lack of time for documentation and the use of EMR at home (Gardner et al., 2019; Privitera & Attalah, 2018). Overall, EMR related tasks have been significantly associated with the increased workload, increased risks of burnout and frustrations, and decreased professional satisfaction. Researchers have shown in their findings that primary care physicians spend a significant number of hours, nearly six hours, concerning EMR related tasks during and after clinic hours (Arndt et al., 2017). EMR strategies are needed to address the problems of workload and burnout issues, which are currently prevalent among the physician population (Downing et al., 2018; Gardner et al., 2019). Therefore, more efforts are needed to provide ample time for physicians to finish documentation tasks, including how to control the amount of use of EMR at home (Henriksen et al., 2019; Micek et al., 2020). Targeting these key points of health information technology could decrease and mitigate the prevalence of physician stress and burnout.

Summary

In this literature review, I presented the details of the framework based on the CAS theory. Strategies used by physicians in the healthcare industry and how EMR documentation strategies impact physicians were also discussed. The CAS framework addresses and acknowledges that healthcare organizations are dynamic, unpredictable, and unique. The literature shows that CAS contributes to the knowledge and evaluation of successful information systems in healthcare (Mason et al., 2017). I also showed that EMR related tasks are significantly associated with the increased workload, increased

risks of burnout and frustrations, and decreased professional satisfaction. Physicians spend a significant number of hours concerning EMR related tasks during and after clinic hours (Arndt et al., 2017). Therefore, EMR strategies are needed to address the problems of workload and burnout issues, which are currently prevalent among the physician population (Downing et al., 2018; Gardner et al., 2019). I also found that, despite the prevalence of EMR systems in healthcare systems in the US, there is still room for improvement regarding the tasks related to entering information into EMR. I also found that poor EMR documentation quality has been raised as a concern in healthcare settings. Researchers have noted the need for improvements that aim to address this barrier of EMR documentation utilization (Lorenzetti et al., 2018; Varela et al., 2019). Barriers to medical practitioners' EMR access can impede their effectiveness in practice, which can be used to highlight the need for the present study.

Transition

The purpose of this qualitative multiple case study is to explore the strategies some private practicing physicians successfully used to develop and implement EMR system that conforms to MU guidelines under the QPP directive for value-based care for patients. I used the conceptual framework to understand the participants' strategies to address the research problem identified in Section 1. In Section 1, I covered the study's key elements, including the problem statement, its purpose, research question, conceptual framework, and a review of the literature. In Section 2, I justify the selected research method and approach used for this study, including my role as the research instrument,

the population, participants and sampling, data collection, analysis, and reliability and validity of the study.

Section 2: The Project

The foundation of a good study is to clearly identify the study objectives and key components, such as its design and approach. Researchers must define their qualitative data collection approach, management, and analysis and anticipate ethical issues (Cypress, 2018). In this section, I discuss the design of this multiple case qualitative study by restating the purpose of this study, a description of the researcher, participants, research method and design, population and sampling, ethical research, data collection, data analysis technique, and reliability and validity.

Purpose Statement

The purpose of this multiple qualitative case study was to explore how private practicing physicians adopt an EMR system that conforms to MU guidelines under the QPP directive for value-based care for patients. The specific population was four physicians with private practices in the Mid-Atlantic United States area, who have successfully implemented an EMR per the CMS guidelines. Physicians believe that using EMR systems has improved record-keeping quality and made it easier to follow patients (Greiver et al., 2011). This study's results could help generate positive social change by providing physicians with EMR systems that can improve the quality of healthcare in the United States.

Role of the Researcher

In qualitative research, the researcher’s role should be well-defined and concise. The role of the researcher is to gather, analyze, and synthesize the data. In qualitative research, the researcher’s primary objective is to evaluate the viewpoints and emotions of

the participants and how the role of the researcher is multifaceted (Råheim, et al., 2016; Sutton & Austin, 2015). Many times, the researcher should seek to inquire about viewpoints and emotions that may be personal to the participant (Råheim, et al., 2016; Sutton & Austin, 2015). The responses from participants vary due to their experiences, and it was the responsibility of the researcher to be considerably detailed during the transcription process (Sutton & Austin, 2015). One of my roles as the researcher was to cover and manage multiple, relevant aspects of the research project. This includes the selection of the study's methodology and design, selecting participants in a fair and just manner, organizing data, analyzing data, and interpretation of data.

As the researcher, I was the primary instrument for data collection. In this case study, my role as the researcher was to carry out the qualitative case study professionally while respecting the components involved. The relationship between myself as the researcher and the topic were professional and personal. As an M.D., M.B.A. who is a medical writer for a biotechnology company, I work with many individuals who use the EMR on a daily basis. To avoid personal bias and follow ethical practices in the research, I adhered to the *Belmont Report* ethics protocol. The *Belmont Report* addresses the need for research integrity on the living participants' significance (Gabriele, 2003). As the researcher, I should respect the participants and do no harm, respect autonomy, abide by justice, obtain informed consent, and be ethical in all of her interactions and communications with the participants in this study (Gabriele, 2003).

As outlined by Arsel (2017) and Castillo-Montoya (2016), as the researcher, I followed predefined forms and research protocols throughout the research to validate

objective data collection to authenticate objective data collection, analysis, and alignment to the research question. All interviews followed a standard practice (Appendix A) and I obtained participant consent. Elucidation and follow-up member checking questions depended upon responses to standard questions. The answers provided by the participants were complete and detailed as outlined in the qualitative approach described by Castillo-Montoya, (2016), Flynn and Korcuska (2018), and Yin (2018). I recorded the interviews with the participants' acknowledgment, consent, and permission, and then transcribed them before analysis for integrity and to minimize bias. During the interviews, I followed up for clarification and member-checking to understand and mitigate potential researcher partiality and bias (McNarry et al., 2019).

As noted by McNarry et al. (2019), I used the bracketing process to reduce researcher bias by creating a list of assumptions before data collection and using the assumptions as part of the study data analysis to identify any potential bias. The interviews were held and recorded using a web conferencing system to avoid exposing participants to undue harm, whether physical or psychological, following social distance guidance. Reflective journaling also helped to note and analyze the research findings. These processes followed the *Belmont Report* guidelines (National Commission for the Protection of Human Subjects and Biomedical and Behavioral Research, 1979). I obtained the approval of the IRB of Walden University, (approval number 11-01-21-0545013), before proceeding with the data collection. My CITI certification to conduct this research is in Appendix B.

Participants

I selected participants for this qualitative multiple case study based on the fact that they ran private practices and used a form of EMR. Rahal et al. (2021) stated that physicians might be using the EMR systems for several reasons, including patient-charting, including the generation of patient information, patient registry information, order entry management, and decision support functionality, and physician subjects in my study used the EMR for those same functions. The targeted population consisted of four private practicing physicians in the Mid-Atlantic United States area. These physicians implement strategies to use and adopt EMR systems to include MU guidelines under the QPP directive for value-based care for patients. The implications for positive social change included the potential to improve the quality interactions between primary care physicians and patients, create more efficient EMR software, improve patient care, and increase the reliability of healthcare systems for communities. I accessed the participants via telephone, email, and face to face conversation.

Participants for this study were four private practicing physicians from healthcare organizations with successful experience in using EMRs to maintain profitability in the Mid-Atlantic Unite States area. For the purpose of the study, leaders may also have multi- and cross-functional roles, such as management and administrative positions. I selected this sample of leaders to explore EMR documentation strategies used by some physicians in the healthcare industry to improve the quality of interactions with their patients and to increase profitability. Participants had experiences in using EMR documentation strategies in the healthcare industry, and knowledge of electronic medical

records documentation challenges and practices, and be within the geographic location of Mid-Atlantic, region of the United States.

To reach out to the identified healthcare leaders, I created an introductory letter with details regarding the purpose of the research. During the research project, it was important that participants felt welcomed during the research project. Participants needed to feel comfortable with their responses to allow me to gather open and honest responses (Yin, 2018). To ensure this, participants were the ones to select the time and place of the interview. This option enabled them to feel like contributors rather than subjects, as Yin (2018) indicated. Additionally, I allowed participants to corroborate and alter their responses at any given time of the study. Researchers have also noted the importance of protecting the participants' identity. This anonymity ensures more open answers and avert possible reprisal (Yin, 2018). To ensure the anonymity of the participants, I redacted their names and replaced them with a respective alphanumeric code (e.g., P1 and P2) to maintain anonymity.

I conducted a Google search of physician practices in the Mid-Atlantic United States participating in EMR strategies at their healthcare organization to identify eligible participants. Additionally, I used personal connections through networking and religious affiliations to identify physicians who identified as private practicing physicians who fulfilled the eligibility criteria for my case study. Through conversations on the telephone or via email, as preferred by the participant, I recruited all of the participants. All participants joined the research on a volunteer basis. In part of the conversation for informed consent, a discussion of my previous professional experience, e.g., as a medical

doctor and working in biotechnology, was used to build a relationship with the participants to enable appropriate and in-depth dialogue.

Research Method and Design

This section discusses the research method and design to describe how and why a qualitative study method was appropriate for this study. Qualitative researchers observe and document the natural environment of the participants they are studying (Yin, 2018). A qualitative design was most appropriate when employing an in-depth analysis of the different programs (Yin, 2018 Additionally, the method and design aligned the study with the procedures for data collection and data analysis processes, as indicated by Ward et al. (2018). Research methodology influences the theory development, the analysis, research duration, and the outcomes of the research (Saunders et al., 2015). In this section, I have justified the rationale for conducting a qualitative case study to explore the strategies private practicing physicians have successfully used to develop and implement an EMR system that conforms to MU guidelines under the QPP directive for value-based care.

Research Method

The purpose of this multiple qualitative case study was to analyze strategies private practicing physicians use to remain in business. The methodology of this study could have been quantitative, qualitative, or mixed methods. However, I chose the qualitative method because, as the researcher, I can study a phenomenon that has emerged from a more extensive study that others have done on the same topic (Hyett et al., 2014). As a researcher, one goal is to become published in a journal, so the research method also was shaped by paradigm, study design, and selection procedures (Hyett et

al., 2014). As indicated by Hyett et al. (2014), the case study methodology used to conduct a study was to advance the understanding of the matter at hand: how physicians use EMR systems that conform to CMS guidelines under the QPP directive. Additionally, a case study allows more flexibility than a grounded theory or a phenomenological study (Hyett et al., 2014). Zucker (2009) indicated discourse analysis, philosophical, and aesthetic paradigms as qualitative case studies through various techniques the researcher prefers; thus, I chose the qualitative method over quantitative and mixed methodologies for this case study.

Research Design

Qualitative research explores, describes, understands, and documents phenomena using *rich data* and *thick descriptions* (Yin, 2018). Qualitative researchers use narrative designs to collect personal life stories and supporting materials from individuals to recreate the context and chain of specific lived experiences (Yin, 2018). Researchers can use phenomenological designs to understand constructs or the meanings of personal *lived experiences* perceived by individuals and communities (Flynn & Korcuska, 2018). The case study methodology explores a process or method experienced by the people involved and allows the researcher to ask participants open-ended questions –why, how, or what – to identify and explore research phenomena (Yin, 2018). The multiple case study method builds upon a single case study by expanding the number of cases to increase the possibility of replication and generalization (Yin, 2018). This case study's research design is specific to scientific and professional literature that involves in-depth interviews with the participants to answer a particular research question (Zucker, 2009).

Case study researchers establish goals to achieve credibility, transferability, dependability, and confirmability (Zucker, 2009). The case study research design allows the researcher to focus on defining the unit of analysis to develop a theory in identifying the case study design (Baškarada, 2014). For this case study, I chose the qualitative method to explore the strategies private practicing physicians successfully used to develop and adopt an EMR system that conforms to MU guidelines under the QPP directive for value-based care for patients.

Population and Sampling

The study target population is the total number of people eligible for sampling consideration in the interview study (Yin, 2018). For this qualitative case study, the chosen sample population was four private practicing physicians. The answers to the research questions through the interview process provided the foundation and themes for me to explore strategies private practicing physicians utilize to adopt an EMR system that conforms to MU guidelines under the QPP directive for value-based care for patients. The sample population was four private practicing physicians in the Mid-Atlantic United States region. I used the sampling method for this study to select the sample population. Barratt et al. (2017) and Mosaly et al. (2017) have said that purposeful sampling helps researchers obtain information-rich cases related to the phenomena of interest. Zyphur's (2019) study showed that purposeful sampling was helpful for researchers in selecting participants who have direct knowledge of the event. Purposeful sampling ensures data richness (Barratt et al., 2017; Mosaly et al., 2017). To study a particular phenomenon in

context, a researcher employs a purposive sampling design (Tobi & Kampen, 2017; Yin, 2018).

Additionally, the participants of this case study will represent the study population. The participants were selected purposefully based on the criteria that they were from organizations that have been in business for at least two years, and they were private practice physicians that own their business. The participants will have implemented successful strategies to adopt an EMR system that conforms to MU guidelines under the QPP directive for value-based care for patients. Saunders et al. (2017) stated that to accomplish data saturation, the researcher must get to a point in the interview process where no new information or themes were forthcoming from the participants. Additionally, Saunders et al. (2019) indicated that the data and methodology should be reproducible in the general population. Data saturation was an essential aspect of this case study, and I achieved this goal by selecting the appropriate sample population. One way I reached data saturation was through member checking and data triangulation.

Thomas (2017) posited that interviewing can be a data collection method that can ensure data saturation with member checking to ensure that the participants understood their questions. Data saturation was supported by triangulation data from interviews and reviewing company documents and records. The results of the interviews were also compared in analysis with data from company records and information from public websites to meet data triangulation requirements. I obtained authorization from Walden University's IRB before contacting and obtaining consent from potential candidates to

participate. I contacted the study participants by phone or email requesting their participation, and I documented their responses indicating their willingness to participate. The interview protocol and the interview questions, as shown in appendix A, were administered to the participants via telephonic interviews. The location of all interviews was an initial phone conversation followed by a face-to-face meeting if allowable per COVID-19 CDC guidelines. I digitally audio-recorded and transcribed the interviews to facilitate the reliability of the data. Member checking follow-up interviews and review of transcripts were planned if requested by the participants to assist with interpreting the transcripts accurately and correctly.

Ethical Research

Ethical consideration was the researcher's responsibility to protect the participants by protecting critical information and data, respecting privacy, and providing confidentiality (Yin, 2018). Walden University requires participants to sign consent forms before the study. The consent form detailed the purpose of the study, procedures, nature of the study, and privacy details (see Appendix B). I attempted to establish contact with the organizational leader by telephone and email. I introduced myself briefly to discuss my topic, the purpose of the study, and how their participation would benefit from the research and potentially nonprofit social service business leaders. Despite methodology and context, all researchers incur ethical issues when focusing on human experience needs, actions, and beliefs (Islam, 2019). Ethical issues consisted of but were not limited to access methods, informed consent, conflict of interest, research design, relationship with the participants, and understanding of contextual risks (Wallace &

Sheldon, 2014). I used confidentiality procedures to protect the participants while maintaining their privacy by adhering to the protocols defined in the Belmont Report (National Commission for the Protection of Human Subjects and Biomedical and Behavioral Research, 1979). To guarantee adherence to ethical standards, I obtained Walden University's IRB approval. The final and completed doctoral study document includes the IRB approval number. In Appendix C, I have included my CITI certificate. Informed consent is communication with the participants as a part of the conversation to help them understand my research's purpose and seek their consent to voluntarily participate in my study (Wall & Pentz, 2015). I used the consent form to document that the participants understood the key elements and their rights and agreed to participate in my study (Koyfman et al., 2016). The consent included privacy and confidentiality protection (Ennever et al., 2019). I also obtained their consent to participate before data collection. During the study, participants had the right to withdraw and were asked to communicate their withdrawal decision via email or refuse to answer the interview questions. There were no incentives for participants, and participation in this study was entirely voluntary.

I conducted phone or face-to-face interviews with all participants by following the interview protocol and questions (Appendix A). I digitally recorded each interview after obtaining consent from the participants. All the data collected was stored as password-protected files on a flash drive for a 5-year period of time to protect the participants' rights. The data collected, including the recording files, and any documents, will be appropriately destroyed after 5 years. To ensure confidentiality, I did not use or disclose

the participants' names, organization names, or identifiable information (Ennever et al., 2019). In place of using participants' demographic information, I assigned codes such as P1 and P2.

Data Collection Instruments

The researcher was the primary data collection instrument performing the data collection and analysis activities in a qualitative research study (Cypress, 2018). A qualitative researcher must begin to be reflexive and consider their methodology's ethicality (Thurairajah, 2019). As the researcher, I conducted this qualitative multiple case study using semistructured, open-ended interviews to gather information. I served as the primary data collection instrument by enrolling participants, interviewing them using semistructured, open-ended questions, and collecting and analyzing the answers to the questions during the interviews. I followed the interview protocol (Appendix A) to conduct interviews and collect data. Interview questions for data collection encompass important concepts of interest, providing a direction for data analysis Yin (2018). The quality of interview questions directly impacts the study (Zhu & Mostafavi, 2017). The interview protocol included an introduction and a list of questions. I began each interview with an explanation of the study's background and objective to the participant, and I included confidentiality statements to remind the participants that they may withdraw at any time from the study. A primary source of data collection for a qualitative case study is the interview (Runfola et al., 2017; Yin, 2018). I used semistructured, open-ended interview questions guided by the interview protocol to collect data to explore strategies used by private practicing physicians *to* adopt an EMR system that conforms to MU

guidelines under the QPP directive for value-based care for patients. Reinecke et al. (2016) have indicated that multiple data sources to determine both convergent and divergent findings are appropriate. Morse (2015) and Yin (2018) have indicated that researchers can enhance validity by using multiple data sources such as interviews, reflective journals, and documents.

Researchers examine sources such as handbook(s), office memo(s), and correspondence(s) to substantiate facts in a case study (Yin, 2018). I performed member checking for data accuracy and reliability and triangulated all information from the interviews and other documents that the participants provided to me regarding their system and payment history. I performed triangulation of data specifically by comparing the organization internal documents with the answer provided to me by the participants. The internal documents known as secondary documents will include documents such as organizational charts, employee job description, employee handbook, organizational goal and plan, and other documents. I assessed the internal documents before the interviews to assess and prepare for the interview. These internal documents were valuable to me as the researcher by lending knowledge to specific terminology and methods used within the organization.

All internal documents for this case study were obtained from the participants and their respective organization via email. Morse (2015) have identified that these processes for member checking will include the participant's involvement in interpreting the data and asking additional questions during and after the interviews to validate data analysis. When requested by the participants, I provided audio recordings of interview

transcripts. I made edits or corrections as indicated as part of the transcript review process. All information from the participants accounted for accuracy, and the final versions of the transcripts and interpretation allowed for data analysis.

Data Collection Technique

In this case study, my research focused on private practicing physician's utilization to adopt an EMR system that conformed to MU guidelines under the QPP directive for value-based care for patients. The primary data gathering instrument was semistructured open-ended interviews, and the questions addressed the central research question. These questions focused on strategies private practicing physicians successfully used to follow MU guidelines to implement EMR systems under the QPP directive. A vast number of EMR documentation strategies were used to improve the quality of interactions with their patients and improve profitability. As the researcher, I was the primary data collection instrument as I conducted the semistructured, open-ended interviews, which was the study's primary source of data. I was also primarily responsible for researching and requesting relevant, essential documents and recording observations throughout the research process. Yin (2018) has identified principles of data collection to guarantee high-quality case studies:

- Use multiple sources of evidence, a case study database.
- Maintain a chain of evidence.
- Exercise care using electronic sources of evidence.

The primary data collection technique I used were over the phone and face-to-face semistructured interviews (via an online platform) guided by the interview protocol

(Appendix A). Additionally, I reviewed publicly available information and documentation shared by the participants related to this study. The primary data collection methods in a qualitative study were interviewing, field observations, and document analysis (Chenail, 2011). Before interviewing participants, I obtained approval from the IRB at Walden University.

To identify participants, I used the purposive sampling design to focus on a particular phenomenon. Per Tobi and Kampen's (2017) guidelines, on purposive sampling, each participant and I had a predetermined time and location for the interviews. Informed consent forms were shared, and an email confirmation was obtained by the participants as to their willingness to be a part of the case study. Each interview was audio recorded via my iPhone. I used the interview protocol outlined by Castillo-Montoya (2016) to enable consistency, maintain order, and guarantee that the participants understood their rights. For consistency and conformity, the same interview protocol was used with all the identified participants. Taliaferro and Diesel (2016) outlined that reflecting journaling is a great tool to improve critical thinking and problem-solving. While listening and conducting the interviews, I took notes and utilized reflective journaling to gain insight into the events the participants were describing.

Researchers use open-ended questions during the semistructured interviews (Yin, 2018) to facilitate fluid interaction with the participants. All recorded interviews were transcribed with the participants' option of interpretations for the utmost accuracy and to ensure data saturation. When no new information or themes were forthcoming in a set of information, and the results could be used for replication, data saturation has been

achieved (Fusch & Ness, 2015; Saunders et al., 2017). Case study validity is pivotal to data saturation (Morse, 2015). Member checking and follow-up member checking interviews were utilized in reaching data saturation (Yin, 2018). My prerogative was to conduct member checking follow-up interviews or email correspondences and edit the transcripts and interpretations accordingly until data saturation was achieved. After providing answers to questions during the interview, I requested documentation to corroborate the data. Adhering to Yin's (2018) principles regarding documents as a data source, I included standard operating procedures, policies, and best practices to discover underlying themes and strategies.

The advantages of using the member checking tool for this case study included:

- the participants had an opportunity to correct errors or misconceptions,
- lessening the risk of participants reporting that the researcher misunderstood their statements, and
- providing the participant, the opportunity to clarify the themes revealed during the interviews (Yin, 2018).

One disadvantage was the demand for the participant's time and commitment. Furthermore, an advantage of a recorded semistructured individual interview was that the interviewer asks the participants the same questions. The participants can respond in their own words, elaborating at will (Ilyushin & Azbel, 2017). The interviewer can also develop a professional rapport with the participants encouraging additional questions prompted by a specific response or body language (Yin, 2018). Divergence from the

initial questions can be a disadvantage of semistructured, face-to-face interviews causing bias (Yin, 2018).

Moreover, I triangulated the participants' documents with publicly available and interview data collected. Fusch et al. (2018) and Joslin and Müller (2016) have indicated that triangulation is a process of authenticating information using numerous sources of data and methods relating to the same event to decrease bias and increase the study's validity. By performing triangulation and member checking simultaneously, I more effectively minimized bias and enhanced the validity and reliability of this case study. To explore strategies private practicing physicians, utilize to adopt an EMR system that conforms to MU guidelines under the QPP directive for value-based care for patients, I collected data directly from the physicians in interviews and additional documents. By enhancing data collection techniques, I ensured that I avoided any disadvantages while analyzing the data.

Data Organization Technique

I collected the following data: an audio recording of every semistructured interview captured via an iPhone and password-protected computer, notes, and transcripts regarding the innovative technology implementation as shared by the participants. Only I, as the researcher, had exclusive access to the safe and password-protected computer. A Google drive contains the audio files for the interviews, participant coding, and transcriptions. The password-protected computer device also contained pertinent documents and observation notes from the interview process. While collecting data, I simultaneously took notes of observations throughout the interview process, allowing me

to interpret further and describe the participants' mannerisms concerning the interview questions (Yin, 2018). The protection of the participants' identities was essential to ensure confidentiality and participated-researcher trust (National Commission for the Protection of Human Subjects and Biomedical and Behavioral Research, 1979). Therefore, all participants were assigned a code name or pseudonym to ensure confidentiality and trust.

Once finalized, each document was saved initially as a Microsoft Word document and then converted to a pdf. All documents (.docx and .pdf) mentioned above and files I have stored and saved electronically in a password-protected Google drive for 5 years. Following the principles set forth by Wall and Pentz (2015) and Ennever et al. (2019), to validate confidentiality and protect the participants from any harm, I refrained from using the participants' names and instead assigned codes (i.e., P1 and P2) to ensure participant privacy. Also, I labeled the data collected from the participants per the assigned codes. During the case study, all the collected data are stored for 5 years after completion and duly destroyed.

Data Analysis

For data analysis, I used a thematic analysis for this research study. Per Yin's (2018) recommended five-step data analysis model, I used the MAXQDA2022 software to compile, disassemble, reassemble, interpret, and conclude the study's findings. Content analysis was done by identifying themes and patterns. The objective of content analysis was to thoroughly identify themes and patterns by coding the interview transcripts and documentation (Sovacool et al., 2018). The software I used helped me to organize the

collected data, maintaining a list of codes and keywords to uphold uniformity (Bengtsson, 2016; Yin, 2018), and to recognize themes. I did use a transcription service, Descript, for transcribing the data information for accuracy and time management. As recommended by Yin (2018), I established a case study database to track all the data collected and maintain the proper chain of evidence.

Nowell et al. (2017) have outlined that thematic analysis is commonly used to label, organize, and interpret themes across a data set. With the use of thematic analysis, a researcher will be able to identify common themes and experiences, which is appropriate for case study research (Yin, 2018). In an attempt to make sense of all elements of the gathered data, thematic analysis often yields the answers to the research questions (Nowell et al., 2017). There are six stages of thematic analysis: (a) familiarize yourself with the data, (b) generate initial codes, (c) search for themes, (d) review the potential themes, (e) define and code the themes, and (f) produce a report (Nowell et al., 2017). After the appropriate transcription method had been established, I analyzed the data with thematic coding from both the semistructured interview information and observations of mannerisms.

I used coding in theme generation together with the data analysis software. Yin (2018) stated that software programs can reorganize the analysis process, allowing the identification of patterns and themes from the generated data. After themes were generated, I compared these themes to the past research and analyzed them on their alignment with the conceptual framework, CAS. With regards past research, I also compared and contrasted themes found in this study with the themes discussed in the

literature review. Specifically, I identified whether the findings of the study agreed with, disagreed with, or provided new information in relation to the research discussed in the literature review. The purpose of performing data analysis was to organize collected data, identify real meaning, and draw conclusions (Bengtsson, 2016). I performed triangulation and member checking to augment my study's validity and reliability to ensure data saturation. Triangulation is a method to authenticate information using multiple sources of data or methods concerning the same events to decrease bias and increase the study's validity (Fusch et al., 2018; Joslin & Müller, 2016). Methodical triangulation involved multiple data collection methods to adjudge a phenomenon (Fusch et al., 2018; Sovacool et al., 2018; Yin, 2018). I used a methodical triangulation approach and triangulated the data collected from face-to-face (in person or via online platforms) interviews, internal and publicly available documentation as evidence of strategies the private practicing physicians utilized to adopt an EMR system that conformed to MU guidelines under the QPP directive for value-based care for patients.

Reliability and Validity

Reliability

Researchers have a responsibility to be methodical to establish and ensure the reliability of their findings. Reliability refers to replication or repeatability to achieve homogenous and consistent results (Bengtsson, 2016; Yin, 2018). Reliability can be achieved by designing a research process that promotes stability while understanding the data and being transparent with reporting (Saunders et al., 2015). Interviews have the potential for bias despite being an efficient way of collecting data and can affect the

study's reliability (Runfola et al., 2017). Bias and errors negatively impact research outcomes, affecting the findings, the analysis, and the interpretation (Saunders et al., 2015). To enhance coding reliability, a researcher performs regular member checks, thick descriptions, and triangulation was utilized (Morse, 2015).

Dependability

Dependability is the consistent nature of the analytical procedures (Noble & Smith, 2015). Dependability enables other scholars to replicate the process of the research project (Leung, 2015). This includes factors of addressing personal research bias or other factors that may have altered the findings (Noble & Smith, 2015). I took multiple steps to ensure dependability. I put in my research journal my listing of possible biases and account for any biases through the use of bracketing (Noble & Smith, 2015). Also, there was in-depth recordkeeping to show a clear audit and data trail. Triangulation was utilized to show a streamlined thought process throughout the data analysis and interpretation phase (Leung, 2015; Yin, 2018). To ensure dependability, I reviewed and verified the data collection process; using bracketing in my data analysis, and then using member checking to help ensure and support that participants were satisfied with their answers and achieved data saturation to ensure dependability.

Validity

Confirmability

Confirmability refers to the extent to which the research findings are consistent and can repeat results (Connelly, 2016). Researchers use confirmability to check and corroborate research findings through documentation, the use of an audit trail, and

double-checking the data collection process for biases and errors (Bush & Amechi, 2019). For this study, I ensured confirmability by conducting an in-depth audit trail of research documents and notes through the triangulation method.

Transferability

Transferability refers to a researcher's ability to follow the methods and procedures that other researchers use in their studies to see what kind of results they get and if the findings of a study apply to other studies (Daniel, 2019). Transferability affords readers rich information from the respondents to corroborate the clarifications of outcome and bridge the gap between the researchers and the respondents (Ospina-Romero et al., 2018). As Amankwaa (2016) prescribed, I implemented transferability by embracing transparency of analysis and trustworthiness. I provided conspicuous findings that resonated with the readers.

Credibility

Credibility refers to the extent to which the readers believe in the process and research results (Van Boekel et al., 2016). Tran et al. (2019) depicted credibility as the quality of believability and trust ability in qualitative research. Researchers utilize member checking to accurately represent the participant's voices through personal experiences and perspectives (Candela, 2019). I used member checking to identify themes by conducting an experienced validating interview process. As Simpson and Quigley (2016) prescribed, I also did a transcript review to validate members by sending the interview transcripts to the participants that requested to see them eliminate biases, correct errors, and eliminate misrepresentation of research.

Data saturation

Researchers use data saturation as a means for terminating their data collection process at the point when further information is no longer reasonable (Saunders et al., 2017). Tran et al. (2019) defined data saturation as the point in qualitative data collection when new information has little or no effects on the information that had already been received. According to Korstjens and Moser (2017), researchers reach data saturation when no new analytical information has been forthcoming, and the researcher grasps the full information on the phenomenon. Hancock et al. (2016) maintained that failure to achieve data saturation in a qualitative study influences the research's validity, reliability, and quality. Saunders et al. (2017) concluded that an open-ended interview is a vital tool for attaining data saturation. To achieve data saturation, I continued to interview the participants using member checking and methodological triangulation responses. I used member checking and methodological triangulation to reach and achieve data saturation**.**

Transition and Summary

The purpose of this qualitative multiple case study was to explore the strategies that some private practicing physicians utilize to adopt an EMR system that conforms to MU guidelines under the QPP directive for value-based care for patients. In section 2, I justified selecting a qualitative multiple case study design and focused on the strategies and approaches used for critical components of this study. In each section, I explained the research method and design, population and sampling of participants, my role as the research instrument, and my approach for ethical research, data collection instruments

and techniques, data organization techniques, data analysis, reliability, and validity that will be used for this study.

This case study was aligned between the research question and the execution of the study. The selection of research methods, approaches, and tools was intended to analyze the research question and to avoid partiality. The foundation of this case study was to investigate the research question and acknowledge the business impact and promote positive social change. The research design was created to align between the research question and the premise of the study.

The case study design approach provided up to date information related to the proposed research question. The sample population selected provided the ability to successfully implement strategies to utilize EMR systems that conformed to CMS guidelines under the QPP directive. The chosen methods used to collect and document the data were for completeness and consistency across interviews. Each of the chosen instruments, processes, methodologies, and tools was academically supported and adhered to the ethical and quality standards outlined by Walden University.

In the next section, I discuss the research question's findings to present the potential business and social implications. The results will be further detailed in the presentation of the researcher's findings. The application to professional practice and implications for social change will also include accepting limitations and delimitations as explained in this document and the recommendations for action and future research. Reflection and conclusions will follow the presentation of the findings. The learnings' reflection will pave the way for suggestions on future improvements. The goal is to

outline ideas on how to gain further comprehension of the phenomena. Lastly, the conclusion will provide the key findings of the study.

Section 3: Application to Professional Practice and Implications for Change

In Section 2, I justified selecting a qualitative multiple case study design and focused on the strategies and approaches used for critical components of this study. The purpose of this qualitative multiple case study was to explore the strategies that some private practicing physicians use to adopt an EMR system that conforms to MU guidelines under the QPP directive for value-based care for patients. In each section, I explained the research method and design, population and sampling of participants, my role as the research instrument, and my approach for ethical research, data collection instruments and techniques, data organization techniques, data analysis, reliability, and validity that was used for this study. Section 3 includes the presentation of the findings, applications for professional practice, and implications for social change. I also provide recommendations for action and future research, my reflections, and the conclusion.

Presentation of the Findings

The data collection process for this study used open-ended questions in semistructured interviews. I used the CAS theory as the conceptual framework to explain how private practice physicians have maintained their solo practice while providing value-based care for patients. I conducted phone interviews with four private practicing physicians in the Mid-Atlantic United States region. Analysis of the interviews and publicly available organization documents resulted in the following main themes: (a) EMR fitness with the physician, (b) sharing of workload to reduce burnout, and (c) choosing the right outsourced billing service. To ensure confidentiality while conducting the study, I assigned an alphanumeric label to the transcribed, recorded data and set the

participant's codes, P1, P2, P3, and P4. All the interview transcripts were entered into MAXQDA2022 to allow for coding and to identify the corresponding themes.

I conducted member checking and reviewed the transcripts closely to ensure data saturation and accuracy. Data saturation was achieved after my fourth interview, indicating that additional interviews were not needed. Following the interviews, I transcribed the participants' interview responses and emailed each participant a copy of the transcriptions. The participants received an interpretation of the interview transcripts for their approval. All participants approved the interview transcripts and my interpretations. I then thanked the participants for their time taking part in the study. After analysis, I used a word cloud to visualize word frequency appearing in the interview transcripts. The word cloud showed autonomy, solo practice, EMR, and hospitalist keywords. All my three themes connect to my research question. . Data analysis resulted in three key themes (see Table 2).

Table 2

Participants That Indicated Using Strategies to Support Value-Based Patient Care for Quality Reimbursement

Themes	P1	P2	P3	P4
EMR Fitness with the Physician	100%	100%	100%	100%
Sharing of Workload to Reduce Burnout	100%	100%	100%	100%
Choosing the right outsourced billing service	100%	100%	100%	100%

Theme 1:

The first theme that emerged during the interviews was the need for the physicians to understand, learn, and adapt an EMR system that was best for them. The participants each had a relationship with the EMR. P3 stated that "I stopped my surgery practice in the last year because of the EMR" and further elaborated that the EMR and the evolution of changes were too much for them to keep up with; however, they continued their solo practice. Additionally, P3 indicated that they still teach at hospitals that use an EMR system. P1 stated, "Athena is a very user-friendly system with meaningful use and quality reimbursement compliance information for physicians." P1 indicated that the proper implementation of Athena in their practice had led to their business profitability and benefited their patients. P2 stated that the "EMR system and the support were beneficial to my practice," indicating that when they were implementing the EMR, they heavily relied on customer service and support. When asked about the influence of the EMR on their solo practice, the participants each indicated that the EMR did indirectly impact their business. The strategies that the participants found most helpful in implementing MU were directly linked to the EMR system's user-friendliness for best practices.

P1 indicated that they conducted a cross-functional data analysis of their patient outcomes with another practice and the use of the EMR was very helpful. P4 stated that they loved their EMR system, Practice Fusion, and it was easy to use and affordable for their solo practice. Gossett et al. (2019) stated that the feedback loops of CAS theory are an integral part of the goodness of fit relationship between understanding, learning, and

the EMR system's adaptation. I questioned the participants about their workflow loops relating to the use of the EMR and patient outcomes. P1 expressly indicated that the EMR is excellent for patient outcomes and control of their conditions. P2 stated that it was easier to find and organize patient CT scans. P3 indicated that the EMR simplifies reimbursements for patients via insurance companies. P4 stated that using the EMR appropriately ensures that the patients get the right care for their condition.

Furthermore, when solo practitioners choose to implement an EMR system, they do so with the thought process that it will be profitable for them and beneficial for their patients. P1 stated, "the EMR is very helpful for keeping track of patients," indicating that the proper implementation of the EMR was directly linked with value-based patient care. Furthermore, P3 stated, "I create templates within the EMR for each patient. For example, if they are a diabetic patient, I will use the diabetes template and update as needed." With this implementation of the service provided by the EMR, they could provide the best patient care and improve their reimbursement amounts. The overall comprehension of the EMR system is directly linked to the physician's ability to adapt an EMR system that is cost-friendly, user-friendly, and improves the physician's ability to conduct their business to avoid burnout, as indicated in Theme 2.

Theme 2: Sharing of Workload to Reduce Burnout

The second theme that emerged from the interviews was the need for workload sharing for solo practitioners to reduce burnout. P2 sold their practice due to the lack of support while being a solo practitioner. P3 sold half their practice due to the constant changes in CMS guidelines for which they needed external support while still lacking

internal support within their practice. P2 and P4 attributed a lack of support for their desire to change career courses and now spend more time teaching physicians than seeing patients. P2 reported that running a solo practice is extremely difficult, and there is not enough support in the medical community for solo practitioners. P4 also indicated that they enjoyed being solo to being a part of a group practice, but they experienced challenges finding coverage for their time off.

Additionally, P2 and P4 indicated that high turnover in their staff resulted in the need to retrain their medical team. This training takes time away from their day-to-day tasks and adds to their workload. When inquired about support, the participants indicated that it was constructive and used it regularly as needed. For instance, P1 stated that it does take time to teach and learn new things, like a new system, but if you have the proper support, it makes the process much easier, and the outcome is preferable. Physicians constantly juggle numerous and various amounts of workload relating to patient care, administrative tasks, and EMR-related tasks (Arndt et al., 2017; Henriksen et al., 2019). P4 stated that they needed a new office manager because they had just fired theirs and indicated that having a solo practice was challenging. Physicians' work-life balance has significantly impacted physician burnout in the last 7 years (Robertson et al., 2017; Shanafelt et al., 2016).

The participants each indicated that from the time they completed their residencies to now, many changes in the healthcare system had required more education, time, and finances to maintain. Additionally, P1 indicated that between Stages 2 and 3 of MU, they had to implement changes in their practice that required both time and finances

to remain compliant with CMS guidelines and billing. P1 stated that they were fortunate in the transition, but they knew colleagues were choosing to retire from their practice due to burnout.

P3 currently works as a nonsurgical solo practitioner and teaches young surgeons. P2 indicated that they have sold their practice and have gone into semiretirement but would still like to help in any way they can with their knowledge, including educating other physicians about the struggles of a solo practice. When asked about the difficulty level of being a solo practitioner, P2 stated that being a "solo practitioner is difficult, the support system is not as good as a group, practice and more guidance and hand-holding" is needed to avoid "burnout and retirement." The decision to retire early due to stress P2 and P3 brought up their semi-retirement, related to physician burnout, supported the findings by Downing et al. (2018) and Tran et al. (2019).

P4 indicated that they prefer solo practice to work as a hospitalist or a group because they found it easier to manage their time and prioritize their family to be able to continue to work versus leave their practice, "more help is always beneficial in ensuring work gets done on time and I can go home to family." As per the CAS study method, the cohesiveness of solo practice, the complexity is dependent on the internal and external inputs to sustain the organization's position in the business world (Davis et al., 2015). Finding a balance between work and home-life is an ultimate goal for all working professionals, and a solo practice gives physicians their autonomy. Nonetheless, solo practitioners are responsible for patient care and business management that requires a tedious workload and is ever-changing, so support is essential.

Theme 3: Choosing the right outsourced billing service

During the interviews, the third theme that emerged was the need for a reliable outsourced medical billing company that is affordable and reliable. Additionally, P4 indicated that it is essential to have outsourced help for coverage during vacation, i.e., outsourcing for nonbilling purposes. Three of the four participants (P2, P3, and P4) indicated that running a solo practice is problematic because it is hard to find people you trust to help run your practice. P3 stated that it was best for them to complete their notes and send them out on a scheduled routine to outsource the billings for reimbursement, "someone takes care of the billing for me so that I do not have to; he is someone I trust very much." P1 stated that due to their reliable outsourced medical biller, they were not having trouble with any billing issues even before the CMS required the EMR. When inquired about how they found outsourced help, P2 indicated that they seek guidance from their colleagues or resources. P4 elaborated that outsourcing their billing was the best way to remain financially sound to avoid spending more time than they were on billing for reimbursement from the CMS. P4 stated, "The EMR we use is not very good for billing, so we outsource our medical billing."

P4 noted that the EMR they were using in their practice was not up to par with medical billing, and they had chosen to spend less on their EMR and instead outsource for medical billing. Though finances were saved on overhead, helping solo practitioners with profitability, P4 stated that more support is always helpful. P4 did indicate having a scribe is preferable to a transcriptionist. P4 also stated that they relied on outsourced medical billing because the EMR they had, Practice Fusion, did not help them with their

billing codes and identified it was not the best but what they could afford. P3 stated that some physicians they know prefer a transcription system as an outsource option to help with their billing. P2 also indicated that they did rely on themselves as the sole practitioner for coding and billing because it helped keep track of the amount of work.

However, P2 further stated that outsourcing was always preferred for them when they were busy and wanted to go on vacation. P4 concurred that fewer mistakes are made with the proper use of outsourced and internal billing systems for reimbursements. To stay in practice, solo practitioners rely on a combination of patient volume and reimbursements linked to billing to remain compliant with MU guidelines. The participants each highlighted that though they are solo practitioners, they still rely on their medical community to remain profitable and in business, and one way they accomplish that is outsourcing, especially since they cannot remember the MU guidelines on their own.

Findings Related to my Conceptual Framework

I used the CAS theory as the conceptual framework to explain how private practice physicians have maintained their solo practice while providing value-based care for patients. Physicians can maintain their practices either as a sole proprietor, join a small or large group of physicians, or become a hospitalist. At each type of practice, the range of complexity varies depending on numerous variables such as following CMS guidelines, provider-patient communication, etc. The physician's strategy as a manager requires examination from two viewpoints, business hierarchy to business hierarchy and the physician to the patient. Moreover, Pype et al. (2017) implied that the use of CAS to

study the integration of the part of a healthcare organization is considered an overall right choice. CAS can be used to analyze how private practicing physicians have successfully used their EMR system to meet the interoperability and information exchange requirements of the Medicare Access and CHIP (Children's Health Insurance Program) Reauthorization Act (MACRA) 2015. For this case study, I used the CAS framework approach to facilitate my understanding of the strategies participants used to follow MU guidelines to implement EMR systems under the QPP directive. In the identification of these strategies, three themes emerged:

1. EMR fitness with the physician,
2. Sharing of workload to reduce burnout,
3. Choosing the right outsourced billing service.

The themes align with the conceptual framework by identifying how feedback loops positively and negatively impact solo practitioners and their businesses. When solo practitioners can appropriately implement the EMR, have the support they need – internally and externally, and have the appropriate medical billing company linked with their business, they can maintain their practice. When a physician is able to maintain their practice, it improves the physician-patient and physician-staff relationships. Boustani et al. (2010) suggested the current healthcare system is diverse, interdependent, and emergent entities. The behaviors of individual entities continually evolve because of regulation by internal and external stakeholders. The complex adaptive systems theory was appropriate for understanding the physician system's various components that must harmonize in a rapidly changing and chaotic environment. The CAS theory outlines an

evolutionary solo practitioner business model that needs to be further studied and understood.

Findings Related to Literature Review

As stated by P2, being a solo practitioner comes at a cost, though you have the autonomy to take the vacations you want and can make more money on your schedule, the right EMR system enables an organization to provide in-house billing without outsourcing their billing and save unnecessary costs (Vawdrey et al., 2014). Medicare has now added new billing codes to enhance reimbursement (Clemens et al., 2021). In completing the case study, numerous peers reviewed articles from various sources were researched. Each of the studied articles was relevant to understanding how private practicing physicians utilize EMR systems that conform to CMS guidelines under the QPP directive. Since the EMR is a recent change in the United States healthcare system, before 1995, researchers tended to explore traditional phenomenological general practice/family medicine and individual practitioner experiences (Sturmberg et al., 2014). Researchers who published articles about the CAS theory between 2000 and 2005 focused on describing medical practice's system dynamics. As indicated in themes two and three, there is a need to support solo practitioners internally and externally from their practices.

In 2001, researchers of the Institute of Medicine (IOM) produced a pivotal study (*Crossing the Quality Chasm*) that endorsed the idea of healthcare systems operating as complex adaptive systems (IOM, 2001). The EHR system (directly and indirectly) improves patient safety, as EHRs mitigated medication errors, enhanced data

documentation completeness, and improved data sustainability (Tubaishat, 2019). After 2005, authors and researchers increasingly applied the breadth of complex science theories to healthcare, health reform, the future of medicine, and the importance of healthcare information systems (Best et al., 2016). Most healthcare researchers focused on small-scale initiatives directed by single healthcare organizations or have focused on large-scale transformation (interventions aimed at coordinated, a system-wide change affecting multiple organizations); healthcare research is scant (Best et al., 2016). The implementation of the ACA prompted healthcare organizations to re-examine the evolving operational landscape. The EMR fundamentally changed the way physicians interacted with their patients and impacted physicians' decisions to be in solo practice.

Physicians and managers of hospitals must now conterminously align to sustain change implementation and adapt to new environmental contexts and changing government requirements (Best et al., 2016). The CAS theory was appropriate to analyze the data collected in this study to explore the strategies private practicing physicians use to utilize EMR systems conforming to the CMS guidelines under the QPP directive. Feedback loops are an integral part of the themes identified as they each rely on one another and directly and indirectly impact the physician's practice. Due to the increased EMR use, there is now a decrease in clinic volume and billing levels with higher reimbursement rates (Ganju et al., 2021). Fleming et al. (2014) found that implementing an EMR system may save only about $15,000 per provider or reduce one administrative staff member to recognize these changes.

There is a need for proper training of all medical staff, especially the physicians, to successfully implement any EMR system provided from the EMR's customer service (McGuire, 2019; Stevens et al., 2017). Gossett et al. (2019) depicted feedback loops that could affect the safety and quality of services, healthcare costs, and stakeholder satisfaction in healthcare systems. The proper implementation of the EMR is linked with correct billing codes that lead to reimbursement. Though EMR use diminishes face-to-face patient care time (Lourie et al., 2020), it is a critical technology that improves patient outcomes and ensures standardization of patient care. The use of EMR is statistically significant and associated with burnout, mainly when used during in-clinic sessions (Micek et al., 2020). When physicians are appropriately reimbursed, they can circulate profitability into their practice by having financial resources to support their staff's salary and pay for an outsourced medical billing company. It can be very constructive to visualize how these systems work in real-life settings by healthcare practitioners who need to achieve equilibrium and fulfill their reporting requirements. In my literature review, I found that researchers have used complexity theory to analyze complex healthcare systems surface and understand their structure and behavior (Mahajan et al., 2017).

However, a complex system is characterized by emergent behavior that does not depend on its parts but its relationships that result from their interaction in feedback among its components. Complexity theory has become the foundation of how systems function in the modern world today and needs CAS to explore further to identify and analyze emergent behavior that does not depend on its parts. Researchers use abstractions

and rely heavily on computer simulations to derive information about the system and what needs to be done to enable system changes to deal with complex systems. Complexity theory has an enormous scope of application in today's environments, mainly because real-world designs are both intricate and challenging at the same time (Elia et al., 2020). Understanding the implication of the EMR, support, and medical billing nuances on a solo practitioner's business will allow for the best physician-patient and physician-staff relationships to ensure value-based patient care that is reproducible and standardized.

Applications to Professional Practice

The purpose of this qualitative multiple case study was to explore the strategies that some private practicing physicians utilize to adopt an EMR system that conforms to MU guidelines under the QPP directive for value-based care for patients. The participants had varied responses when asked about the strategies they successfully used to adopt an EMR system to follow MU guidelines under the QPP directive. Interestingly, each participant mentioned that they were educated on the three stages of the MU in its inception; however, they relied on the EMR and billing companies to ensure they were following them. With the three themes that have been identified (1) EMR fitness with the physician, (2) sharing of workload to reduce burnout, and (3) choosing the right outsourced billing service. Gossett et al. (2019) indicated that feedback loops could affect the profitability and sustaining of solo practice as per the CAS theory.

Medical practices can improve in various ways, including front desk staff, clinical and non-clinical staff, educations, efficiency, and patient care (Berry et al., 2018). The

CMS guidelines are among the many factors that impact factors that impact a physician's business, but, the need to stay educated and be adaptable is just as critical. The findings of this study may contribute to professional practice if physicians implement strategies relating to the three themes identified. Helping physicians maintain their autonomy and learn about business practices that can support their solo practices can be evolutionary.

Implications for Social Change

The results of this study can positively impact social change by helping both young and established physicians choose EMR systems that can improve the quality of healthcare in the United States. The implications for positive social change include the potential to increase autonomy among physicians, improve patient care, and avoid career changes among physicians. Furthermore, the participants highlighted that the MU guidelines were helpful for patients as it was easier to follow patients through complex care and basic screenings like colonoscopy, mammogram, and vaccinations. Each of the three themes identified solidified the need for supporting solo practitioners for the best, value-based patient care while ensuring the success of their businesses.

Recommendations for Action

There is a current need for education and support for physicians on the various career paths after completing their residencies. Some physicians are not educated on career paths and value-based patient care throughout medical school and residency programs. Physicians are intimated to work independently with the ever-changing CMS guidelines, different reimbursement plans, and the MU stages' complexity. The end goal of all patient encounters is to provide value-based care, ensure positive patient outcomes,

and successfully deliver the highest level of care. All participants agreed that it is essential to understand patient needs and concerns. One point of action recommended by the participants was the need for education and support of solo practitioners. Specifically, P1 and P4 stated that more literature regarding the practical, implementable aspects of running a solo practice as a successful, sustainable business.

Recommendations for Further Research

I conducted a qualitative multiple case study on strategies private practicing physicians utilize to adopt an EMR system that conforms to MU guidelines under the QPP directive for value-based care for patients. The strategies identified in the study are essential for the retention of solo practitioners. The findings of this case study were based on the knowledge and insight of four solo practitioners in the Mid-Atlantic region of the USA. I recommend that further research be conducted on physicians leaving private practice for hospitalist positions or early retirement. I would argue that it is essential to understand how and why physicians leave private practice due to the EMR functioning. Did their decision to switch from private practice to hospitalist have been influenced by EMR implementation, or did they sell their private practice due to lack of support? The results of this case study have indicated that some physicians may have trouble conducting their patient encounters while simultaneously typing in the EMR. I also recommend further research on the pros and cons of hiring a scribe to improve patient encounters. However, what are the implications of increasing overhead for solo practice, and is it worth the time, energy, and finances to hire a scribe that may only commit part-time and short-term? Lastly, the interviews shed light on the need for some physician

practices to outsource medical billing. Further research should be conducted on what kinds of physicians' practices benefit from outsourcing their billing versus have an internal billing system. Independently billing otolaryngology (ORL) advanced practice providers (APPs) are rapidly increasing in number, leading to increased Medicare reimbursements (Patel et al., 2021). This outsourcing indicates that physicians rely heavily on individuals outside of their practice and those inside their solo practice.

Reflections

The Doctor of Business Administration journey has been a wonderful one that has taught me so much. In the end I am grateful to have had this opportunity. As a medical doctor who chose not to practice, there was a lot more I wanted to do and use my knowledge in the process. Nonetheless, I have learned that I am only a few miles into a lifelong journey of learning. I do hope that through my research someone can be inspired and more light can be shed on the overlooked areas of medical practice.

Conclusion

The purpose of this qualitative multiple case study was to explore strategies that physicians use while maintaining a successful private practice without compromising value-based patient care as outlined by the QPP under the CMS. I identified three main themes in this study, the three themes were:

1. EMR fitness with the physician,
2. Sharing of workload to reduce burnout,
3. Choosing the right outsourced billing service.

The themes align with the conceptual framework and review of the professional and academic literature. Like other service-related industries, the healthcare system depends on information technology to provide efficient services even with limited staff and resources (Jones et al., 2014). The findings of this study can positively influence social change by increasing profits for private practicing physicians in the Mid-Atlantic region of the USA and help them maintain their autonomy versus going into early retirement or becoming hospitalists. Increasing the likelihood of solo practitioners being profitable and understanding their struggles will create a foundation for successful businesses and improved value-based patient care.

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Appendix A: Interview Protocol

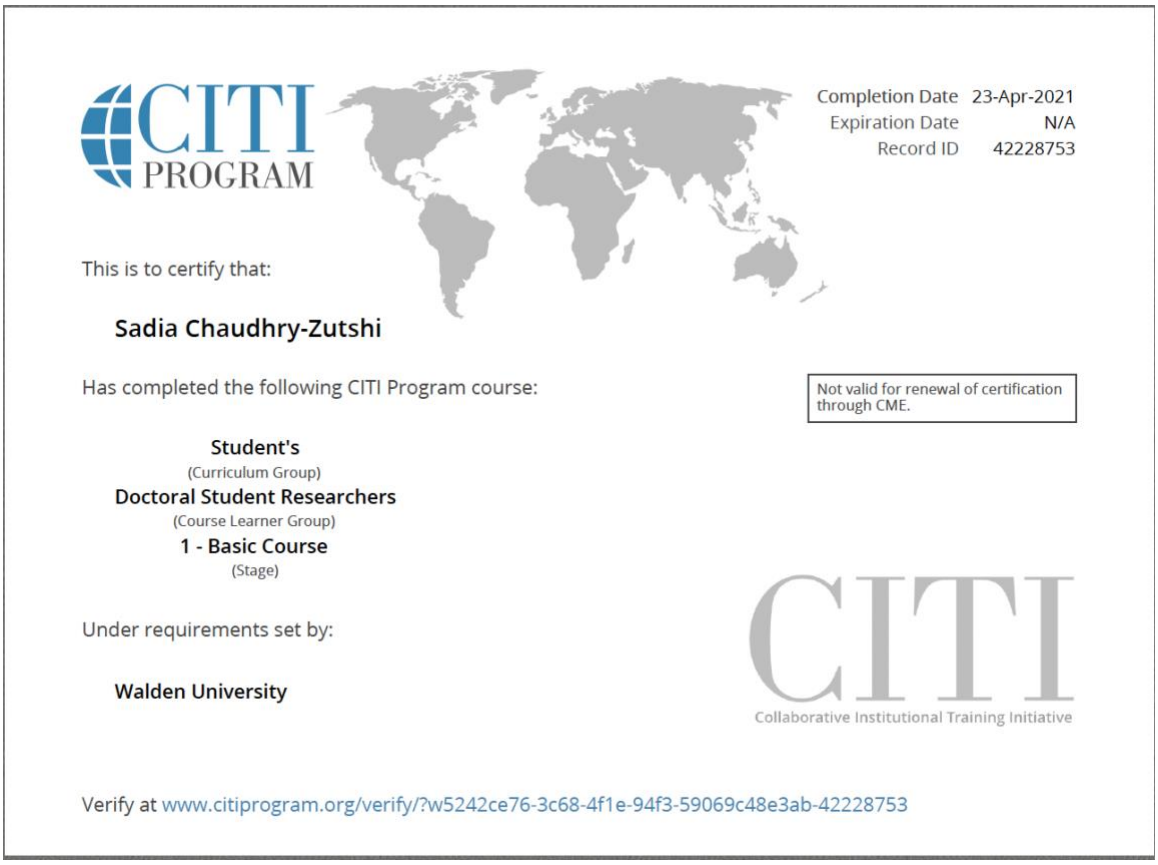
Interview introduction:

1. Introduce the topic and objectives.
2. Explain the purpose and scope of the study.
3. Assure participants that their name and organization information will be kept confidential.
4. Ask to record the interview and let the participant know that the materials will be stored for a maximum of 5 years.
5. Let participants know they can stop if they do not wish to proceed.

Strategic research questions Reminders to do during the interview: Watch for nonverbal cues. Paraphrase as needed. Ask follow-up probing questions to get more in-depth, rich data.	1. Which EMR system do you use in your private practice and what strategies have you found most helpful in implementing the CMS guidelines? 2. Stage One of MU began in 2011 and ended in 2013; how did you succeed in meeting the 15 core objectives and 5 of the ten menu objectives? 3. For Stage Two of MU, how did you succeed in meeting the criteria that focused on ensuring MU of EMR systems and exchanging electronic information in the most organized format? 4. For Stage Three of MU, how did you meet the eight optional requirements for providers in 2017 and mandatory for all participants in 2018? 5. How, if at all, based upon your experience, did using EMR foster your practice's profitability? 6. How are strategies that involve EMR and MU helping your practice and patients? 7. What else can you tell me about the strategies you have developed and implemented regarding EMR systems for MU under the QPP?
Wrap up interview	Thank the participant for their time and information. Schedule a follow-up interview for member checking.
Follow-up member checking interview	Introduction: 1. Reiterate and refresh the topic and objectives. 2. Introduction for follow-up.

Reminders to do during the interview: Watch for nonverbal cues. Paraphrase as needed. Ask follow-up probing questions to get more in-depth, rich data.	3. Assure participants that their name and organization information will be kept confidential. 4. Ask to record the follow-up interview. 5. Let participants know they can stop if they do not wish to proceed. Follow-up Interview: 1. Share a copy of the interpretation and synthesis of answers for each question. 2. Walk through each question including the interpretation of answers to ensure information was not missed and include any additional information. 3. Ask any additional questions related to the initial interview to add clarity to the research topic. 4. Wrap up follow-up interview by thanking the participant.

Appendix B: CITI Certificate



CITI PROGRAM

Completion Date 23-Apr-2021
Expiration Date N/A
Record ID 42228753

This is to certify that:

Sadia Chaudhry-Zutshi

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

Student's
(Curriculum Group)
Doctoral Student Researchers
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Walden University

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w5242ce76-3c68-4f1e-94f3-59069c48e3ab-42228753