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Diffusion of Electronic Health Records in Rural Primary Care Clinics

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This is to certify that the doctoral study by

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2015

Abstract

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by

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MS, Walden University, 2010

BS, Walden University, 2007

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

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Abstract

By the end of 2015, Medicare-eligible physicians at primary care practices (PCP) who do not use an electronic health record (EHR) system will incur stiff penalties if they fail to meet the deadline for using EHRs. Yet, less than 30% of rural primary clinics have fully functional EHR systems. The purpose of this phenomenology study was to explore rural primary care physicians and physician assistants' experiences regarding overcoming barriers to implementing EHRs. Complex adaptive systems formed the conceptual framework for this study. Data were collected through face-to-face interviews with a purposeful sample of 21 physicians and physician assistants across 2 rural PCPs in the southeastern region of Missouri. Participant perceptions were elicited regarding overcoming barriers to implementing EHRs under the American Recovery and Reinvestment Act, Health Information Technology for Economic and Clinical Health, and the Patient Protection and Affordable Care Act legislation. Interview questions were transcribed and processed through qualitative software to discern themes of how rural PCP physicians and physician assistants might overcome barriers to implementing electronic health records. Through the exploration of the narrative segments, 4 emergent themes were common among the participants: (a) limited finances to support EHRs, (b) health information exchange issues, (c) lack of business education, and (d) lack of transformation at rural medical practices. The implications for positive social change include the potential implementation of EHRs particularly in physician practices in rural communities, which could provide cost-efficient health care services for those communities and a more sustainable future at primary care practices.

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Dedication

I dedicate this work to my family, who has provided unending support and patience throughout this journey and has been tolerant of the sacrifices that have allowed me to pursue my dream. I dedicate this degree to my husband, Bobby, for supporting me not only in this doctoral endeavor, but also throughout every crazy entrepreneurial idea that I have undertaken in the past 35 years we have been together. I also dedicate this work to my two children, Cara and Dustin; my two children by marriage, Cory and Twila; and my five grandchildren, Cali, Christian, Cole, Cruz, and Bella, who are my rock. I hope my educational endeavors will inspire you all to dream big and work hard. I also dedicate this work to my parents, Lee J. and Beulah Jarrell, who taught me how to work hard, believe in myself, follow my dreams, and excel in all things. Finally, I dedicate this work to my beautiful sister and best friend, who fought a hard fight and lost her yearlong battle with cancer last summer at age 58. She taught me about strength, unconditional love, and courage.

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Many individuals contributed to and encouraged my success over the years, and I owe each of them a debt of gratitude. I thank Dr. Lynn Szostek, who has been both my mentor and guiding force for my doctoral study. Dr. David Moody also provided guidance and instruction on my doctoral study and helped to make it better. I would like to thank Dr. Reggie Taylor and Dr. Roger Mayer for helping me along my journey. In addition, Dr. Freda Turner was very helpful in sharpening my prose and pushing me to excel. Throughout my adult life, I have benefitted from several leaders and mentors who have shaped my success and ambition, whether they knew it or not. Jan Riemann of Metro Business College both inspired and challenged me in my undergraduate studies. My dad, Lee J. Jarrell, a construction business owner/farmer, taught me about hard work and discipline. I thank my parents, Lee J. and Beulah Jarrell, for teaching me to work hard and dream big, the example they set before me. I know you are smiling down from heaven. My husband Bobby and my children and grandchildren are my sources of inspiration and the reason I have pushed myself to strive to be the best. Most of all, I thank God, who has blessed me beyond what I deserve.

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Section 1: Foundation of the Study

Health care organizations continue to implement electronic health records (EHRs) to improve the health care system and reduce costs for increasing health care expenditures (Kumar & Bauer, 2011). However, there is no guarantee comprehensive health information technology (HIT) investments are worth the time or money. HIT requires large investments in equipment, software, training, maintenance, and change management, plus coordination, leadership, and governance (Adler-Milstein & Bates, 2010). These factors illustrate the complexity of implementing HIT systems and why health care professionals doubt their large investment (Deutsch, Duftschmid, & Dorda, 2010).

The lived experiences of rural primary care physicians (PCPs) and physician assistants on barriers to implementing EHRs at rural primary care clinics were the subject of the study. Particularly, the rural PCPs and physician assistants' knowledge about (a) overcoming barriers to implementing and dissemination of EHR technology, (b) EHR decision-making at rural primary care clinics, (c) project planning and policy changes, and (d) relationship management of the stakeholders (Deutsch et al., 2010). I used a qualitative, phenomenological method and design to explore rural primary care clinics that implemented EHR systems in the previous 6 months.

Background of the Problem

In the 1970s, EHRs began to emerge (Gold, McLaughlin, Devers, Berenson, & Bovbjerg, 2012). By 2010, EHRs were reality in a variety of health care locations in the United States (Gold et al., 2012). As EHRs continue to be implemented, the focus is on

the funding in the Health Information Technology for Economic and Clinical Health (HITECH) Act (Brokel, 2010). The HITECH Act provides incentive payments to physicians who want EHRs through Medicare and Medicaid. As of 2015, there are penalties for physicians not using EHRs, with harsher penalties to come in 2016 and 2017 (Gold et al., 2012). However, health care practitioners and health care businesses in primary care settings that do not have cultures focused on HIT development still struggle to see the benefits of EHRs (Classen & Bates, 2011). Health care companies lag behind in the development of EHR systems (Kivinen & Lammintakanen, 2012). Continuous improvement and understanding will be critical as health care companies continue to transform and transition towards modern EHR technology (Bennett, Doub, & Selove, 2012).

In spite of the increasing EHR investments, there are still many problems with implementing and using EHRs. Researchers have identified several advantages and disadvantages when implementing EHRs. The EHR advantages are quality of care improvements, increased privacy, security, better access to relevant health information, reduced health care errors, improved collaboration, and the promotion of healthy behaviors (Kreps & Neuhauser, 2010; Tolar & Balka, 2012). EHR implementation can also result in significant cost and time savings for health care practices (Hatton, Schmidt, & Jelen, 2012; Lawler, Hedge, & Pavlovic-Veselinovic, 2011). The disadvantages of EHRs are financial, education, security, and electronic data communication challenges (Aarts, 2012; Deutsch et al., 2010; Harrison & Ramanujan, 2011). Financial problems include the initial and ongoing EHR equipment costs and costs associated with adjusting

workplace workflow to the new technology (Dykman & Davis, 2012; Lluch, 2011; Mechanic, 2008). Greysen, Wassermann, Payne, and Mullan (2009) and Weingarten, Schindler, Siegel, and Landau (2013) noted that a majority of medical professionals do not acquire formal business training while attending medical school. Privacy and security problems include protecting patients' privacy by restricting access to health records by unauthorized people (Aarts, 2012; Clarke, Flaherty, Hollis, & Tomallo, 2009). Technological challenges in implementing EHRs consist of deciding the information to trade among other health care administration and how to resolve compatibility issues among different systems (Lanham, Leykum, & McDaniel, 2012; Lluch, 2011). Changes in society and economics also make it difficult to maintain order and excellence in health care.

Under the present circumstances, EHR adoption will achieve maximum market share in 2024 (Aarts, 2012; Neumann & Dul, 2010). However, less than 30% of rural medical practices have fully functional EHR systems (Goldberg, 2012). Missouri Department of Social Services (2011) reported less than 10% of rural primary care clinics in Missouri have implemented EHRs based on a Medicaid HIT review. For this reason, there is a need to research EHR implementation barriers, which prevent rural primary care clinics from adopting EHRs. Research, best practices, and ongoing EHR training and development leads to more EHR dissemination in primary care clinics (Duszak & Saunder, 2010).

Problem Statement

Kasiri, Sharda, and Asamoah (2012) pointed out PCP will face stiff penalties if they fail to implement EHRs by 2015. Less than 30% of rural primary clinics have fully functional EHR systems (Goldberg, 2012). The general business problem is rural primary care clinics have a low EHR adoption rates. The specific business problem is physicians and physician assistants at rural primary care clinics have limited knowledge on overcoming barriers to implementing EHRs.

Purpose Statement

The purpose of this qualitative phenomenology study was to explore rural PCPs and physician assistants' experiences regarding overcoming barriers to implementing electronic health records. The targeted population was 20 or more rural PCPs and physician assistants located at primary care clinics in the southeast region of Missouri. This population was appropriate for the study because research shows less than 30% of rural primary clinics have fully functional EHR systems (Goldberg, 2012). The implication for positive social change includes the potential to provide cost efficient health care services for a more sustainable future (Channon, Riley, & Sussman, 2012).

Nature of the Study

The three research methods a researcher can use are qualitative, quantitative, or mixed methods. Ross and Onwuegbuzie (2014) suggested qualitative methodology offers flexibility. Chenial (2011) stated qualitative studies are naturalistic, descriptive, or interpretive, exploratory, subjective, and inductive. Qualitative researchers explore literature to learn about different data collections methods to reveal a new way of

thinking (Chenail, 2011). Scholars uphold qualitative and quantitative methods have different philosophical underpinnings that lead to fundamentally different research approaches (Tufford & Newman, 2012). Leech and Onwuegbuzie (2009) recommended quantitative researchers utilize larger random samples and statistical measures to achieve generalized results. Ross and Onwuegbuzie (2014) also stated quantitative investigators analyze and measure casual relationships between variables, and not processes. The mixed method approach uses qualitative research to develop an understanding of the problem and a quantitative research for validating larger random samples through statistical tests (Ross & Onwuegbuzie, 2014). Based on scholarly assertions regarding the suitability of the method, qualitative methods suit the purpose of the study more than a quantitative or mixed method approach because the focus was on overcoming barriers to implementing EHRs.

A researcher can also accomplish a qualitative study by using a case study, ethnography, grounded theory, narrative, or phenomenological design. A case study design is an in-depth investigation of a phenomenon used when the context may not be evident (Ali & Yusof, 2011; Yin, 2013). An ethnographic researcher looks for predictable culture patterns in the everyday lives of the participants to create a contextual understanding of what groups do (Kriyantono, 2012; Nuttall, Shankar, & Beverland, 2011; Sangasubana, 2011). Using a grounded theory research would create or discover a theory (Nuttall et al., 2011). A narrative design would share the participants' relationship to the world by writing about their individual story of life experiences (Holley & Colyar, 2012). While these designs are valuable for various qualitative studies, they do not allow

for the study of emerging events associated with the lived experiences of rural PCPs and physician assistants on how rural primary care clinics can overcome barriers to implementing electronic health records. A phenomenological design reveals the lived experiences of a particular audience (Reiter, Stewart, & Bruce, 2011). A phenomenological research design was suitable for the study because I explored the lived experiences of rural PCPs and physician assistants on how rural primary care clinics can overcome barriers to implementing electronic health records. I used an adapted van Kaam process developed by Moustakas in 1994 for analysis to code, reduce, group, generate and cluster the data into meaningful themes.

Research Question

The overarching research question for this study was as follows:

What are the rural primary care physicians and physician assistants' lived experiences and perceptions of complex adaptive systems as they pertain to overcoming barriers to implementing electronic health records?

Interview Questions

1. What are your experiences related to barriers to implementing electronic health records systems?
2. How are internal mechanisms, such as shared health networks, internal technology, and technology diffusion mechanisms, such as staff technology skills and knowledge and the staff's ability to learn and adapt, related to these barriers?
3. How can health care administrators at rural primary care clinics work together

with multiple agents to reduce barriers and increase electronic health records adoption rates?

4. How do environmental factors, such as consumer health marketplaces, and the demand for access to patients' health records relate to electronic health records systems implementation barriers?
5. How do other environmental factors, such as the patient's demand and payer source demand for the EHR bill processing, relate to these barriers?
6. How do rural primary care physicians and physician assistants define the health care organizations cultural systems and behaviors related to electronic health records implementation barriers?
7. What are the perceived external environmental barriers to implementing electronic health records at rural primary care clinics, such as government regulations, technology development, and health care demand?
8. How can primary care physicians and physician's assistants work together with other agents to overcome barriers to implementing electronic health records systems at rural primary care clinics?
9. What else you would like to add that I did not address in these questions?

Conceptual Framework

The idea of health care businesses as complex adaptive systems (CAS) formed the conceptual framework for the study. CAS focuses on the interplay between multiple agents that work together and correspond in larger environments and the coevolution of systems and the environment (Borzillo & Kaminska-Labbé, 2011; Vessey & Ward,

2013). The value of EHRs to the health care system and customers decide the monetary potential for all other agents in the network. A health care system refers to a network of health care organizations that collectively supply health care needs similar to the buying firm. Four foci become evident when examining CAS and EHRs implementation barriers: (a) environment, (b) internal mechanisms, (c) interaction of multiple agents, and (d) co-evolution (Carlisle & McMillan, 2006; Monostori & Ueda, 2006; Vessey & Ward, 2013). The environment consists of multiple agents who exert demand for access to a patient's records, the patient's demand for EHRs, and payer source demand for EHRs bill processing. Internal mechanisms are communal health networks, internal technology, and technology diffusion mechanisms such as staff technology skills, knowledge, and the staff's ability to learn and adapt to systems and the environment. Multiple agents are physicians, patients, insurance, third party payers, and other health information network exchanges. Co-evolution is two or more of these interdependent agents adapting to changes within a larger environment. The CAS theory was best for understanding several components of the health care system and EHRs to remove the barriers of EHR implementation in a rapidly changing and chaotic environment.

Definition of Terms

These definitions, which may be industry specific, offer clarity to the study.

Change management theory: Change management theory is used to transition employees, groups, and companies to a future state (Burke, 2011).

Complex adaptive system theory (CAS): CAS is used to describe the complexity of natural systems, which emerge from the interaction of multiple agents (Mittal, 2013).

Electronic health records (EHR): EHRs are patient health records in digital form. These EHRs are the same as the paper-based charts, but more efficient, and include the patient's complete medical history, evaluation records, and demographics (Bennett, Doub, & Selove, 2012).

Electronic medical record (EMR): EMRs are a digital version of a patient's medical record stored on a computer for easy access. They are the same as paper charts and include the patient's complete medical history, evaluation records, and demographics (Thompson, 2010).

Health information exchange (HIE). HIE is the movement of electronic health information between organizations according to a set of values. The distribution includes radiology and laboratory results and problem lists and medication history (eHealth Initiative, 2012).

Health information technology (HIT): HIT is information processing using computer hardware and software for the entrance, storage, recovery, and distribution of a patient's health information (Lee & Meuter, 2010).

Primary care clinic: The patient's first point of entry into the health care system for an undiagnosed health problem and continuing care of various medical conditions (Al-Namash, Al-Najjar, Kandary, Makboul, & El-Shazly, 2011).

Primary care physician (PCP): PCPs are general health care practitioners who treat minor health care issues and provide continued care for various medical conditions (Al-Namash et al., 2011).

Assumptions, Limitations, and Delimitations

Deficiencies in research are assumptions, limitations, and delimitations. Assumptions are what I assume. Limitations are weaknesses out of the investigator's control. Delimitations are within the researcher's control, and it defines the limits of the inquiry. It is necessary to achieve each to maintain the integrity of the study (Patton, 2002).

Assumptions

The key assumption of the study was the participants speak English and understand the questions and the importance of privacy and anonymity. Additionally, the interview sample represents rural PCPs and physician assistants. Further, I assumed the participants answered the interview questions truthfully, without prejudice or social pressure, providing their personal experiences for overcoming barriers to implementing EHRs at rural primary care clinics.

Limitations

The limitations of the qualitative, phenomenological account were practical constraints. The first hurdle was the unfeasibility of interviewing every rural primary care clinic. For this reason, the study results were not useful or do not generalize to every rural primary care clinic, in general. Second, there were only20 participants in the investigation. Third, the review did not cover all of the stakeholders', or physicians', experiences or independent units such as health insurance and hospitals so it might affect EHR adoption and implementation in a wider context. The study limited all of these factors, which affect rural primary care clinics. The length of time to do the study was

also a limitation because of the IRB timeline approval. Finally, the lens through which I observed the rural PCPs and physician assistants' responses was a barrier even though the focus was on overcoming barriers to implementing EHRs and not changing health care systems at the community and state level.

Delimitations

The main delimitation of the study was the purposive sample size of20 rural PCPs and physician assistants chosen from rural primary care clinics. An additional delimitation was the geographical constraint of the investigation. The outside scope of the inquiry was the elimination of the stakeholders' experiences on overcoming barriers to implementing EHRs.

Significance of the Study

The results of the study might be of value to the business community and create a social impact on overcoming barriers to implementing and increasing the rates of electronic health records adoption at rural primary clinics. As the federal government continues to reduce health care funding, PCPs at rural primary care clinics have to find ways to provide cost effective health care services to be sustainable (Channon et al., 2012). Qualitative research helps to fill gaps, extend the literature, and encourage future research. It also provides structure for future research and comparison on overcoming barriers to implementing EHRs at rural primary care clinics. Further research helps to improve business processes, practices, and policies (Adams & Gaetane, 2011).

Contribution to Business Practice

The results of the qualitative, phenomenological study might provide

understanding on overcoming barriers to implementing EHRs at rural primary care clinics from rural PCPs and physician assistants' perspective. Documenting the rural PCPs and physician assistants' lived experiences will add to existing qualitative research (Sheffield, Sankaran, & Haslett, 2012). Exploring factors that control decision making may provide information to rural primary care clinics' stakeholders so they can work toward successful EHR implementation, thus capitalizing on health care cost reductions and increasing the quality of care (Mechanic, 2008). Exploring the lived experiences of rural PCPs and physician assistants on overcoming barriers to implementing EHRs may also contribute to qualitative research in the HIT field of health care and encourage more EHR implementation, adoption, and use (Goldberg, 2012). Publishing the results and recommendations of the study may contribute to the federal governments' initiatives to promote the adoption of HIT. The results and recommendations from the study may also help rural PCPs and physician assistants find ways to provide cost effective health care services to sustain their business (Adler-Milstein & Bates, 2010; Channon et al., 2012).

Implications for Social Change

The qualitative, phenomenological research may advance the body of knowledge relating to the rural PCPs and physician assistants' lived experiences on overcoming barriers to implementing EHRs in the industry of health care and rural primary care clinics. The social impact may be as the federal government continues to reduce primary health care services, rural primary care clinics and PCPs have to fill the gap by providing quality health care. Social changes drove the need for innovations and a more efficient health care system (Adler-Milstein & Bates, 2010) because of increased life expectancy

and reduced resources (Stafinski, Christopher, & Menon, 2010). The establishment of policy and procedures may increase EHR implementation and adoption rates at primary care clinics for a more sustainable future (Channon et al., 2012) and support social change.

A Review of the Professional and Academic Literature

The current dilemma of the future sustainable business practices takes place in an era of volatile economic conditions. Business research is far from addressing the core needs and requirements of sustainable business practices. The literature remains diminutive in regard to management models for managing and developing competencies when using complex systems such as EHRs (Caldeira & Dhillon, 2010; Patel, Abramson, Edwards, Malhotra, & Kaushal, 2011). However, in order for organizations to benefit from HIT investments, they must develop their business competencies to take advantage of HITs (Adler-Milstein & Bates, 2010).

The purpose of this qualitative, phenomenological study was to describe lived experiences and perceptions on overcoming barriers to implementing EHRs at rural primary care clinics. Twenty interviews is an appropriate sample size for qualitative, phenomenological investigations (Hanson, Balmer, & Giardino, 2011). The overarching research question was, What were the rural primary care physicians and physician assistants' lived experiences and perceptions of complex adaptive systems as they pertain to overcoming barriers to implementing electronic health records?

The following concepts laid the foundation for the present analysis on overcoming barriers to implementing EHRs at rural primary care clinics within a

framework of previous EHR studies: (a) complex adaptive systems, (b) the history of EHRs, (c) current plans to promote the use of HIEs and EHRs, (d) present studies on EHR adoption, (e) EHR and HIE adoption barriers, and (f) solutions for the adoption of EHRs and HIEs. The literature review also provides guidance for EHR systems implementation and adoption opportunities within rural primary care clinics.

Title Searches, Articles, Research Documents, and Journals

I accessed the research materials through the Walden University Library databases such as ABI/INFORM Global, Academic Search Complete/Premier, Business Source Complete/Premier, Emerald, ProQuest Central, ProQuest Health and Medical Complete, PubMed, Health Sciences: A SAGE Full-Text Collection, MEDLINE, Nursing & Allied Health Source, Sage Publications, and Science Direct. The searches generated references to peer-reviewed articles and scholarly books. Publications also included books and Internet websites such as Google Scholar and other relevant sources to assist in evaluating and synthesizing the information in the literature review. More than 100 sources contributed to the study. A majority of these sources were published between 2011 and 2014.

I researched using the following words: *change management theory, electronic health records, electronic medical records, digital patient records, health information technology, medical records, primary care clinics, primary care physicians,* and *privacy and security*.

Complex Adaptive Systems

Natural scientists developed the theory of CAS (Vessey & Ward, 2013). CAS

researcher views are actors within the environment constantly adapting and learning from one another (Borzillo & Kaminska-Labbé, 2011; Vessey & Ward, 2013). Portor and Córdoba (2009) suggested actors influence the environment in which they evolve so players must learn to coevolve within the environment. Similar to Portor and Córdoba, Bloom and Wolcott (2012) recommended applying CAS for managing change because of the coevolution of actors and their relations to internal and external stimuli. Economists Harford (2012) and Beinhocker (2013) further found responses to diminutive errors improve learning and success in a rapidly changing environment. All of these researchers understand the process through which actors survive in complex environments, negotiate their conflict of interest, learn innovative ways of doing things, and co-create new systems.

The health care industry fits the criterion of CAS (Carlisle, 2011). Vessey and Ward (2013) suggested CAS requires individual agents to adjust to the actions of other agents, interact with each other, and adapt to the environment, thus creating a united system pattern. Mukherjee (2008) described CAS similar to Monostori and Ueda (2006) in terms of adaptableness, chaos, complex systems, and evolution. When complex behaviors emerge, health care organizations must innovate and look for long-term sustainability solutions (Karwowski, 2012). Knowing one part of the health care system allows health care businesses to understand something about other parts of the same system.

Health care systems consist of various agents and interconnected players, such as health care providers, patients, payers, and policymakers, who deliver health care

services through different methods. Paina and Peters (2011) suggested using the CASs theory to health care problems because CAS might help policy forecasters to explore innovative approaches to health care for populations in need. Similar to Paina and Peters (2011), Boustani et al. (2010) recommended applying CAS principles to the health care industry because of its unpredictable nature of policy development and implementing changes within health care delivery systems. McDaniel, Lanham, and Anderson (2009) further found the value of CAS for new solutions of coevolving health care problems. However, many factors must come together as change increases so interconnected components work together and organizations do not struggle as they adapt to change (Karwowski, 2012). Innovative technologies improve the company's ability to adapt and advance their capabilities.

Complex health care organizations must quickly adapt, evolve, and adopt strategic models to continue to exist. Karwowski (2012) recommended health care systems components become unpredictable when complex behaviors emerge as mutually dependent interactions. Similar to Karwowski (2012), Diez Roux (2011) suggested complexity moves health care organizations towards discontinuous change. Boustani et al. (2010) echoed the present health care system is highly variable and requires adaptability, innovation, and self-learning because of diverse, interdependent, and emergent entities that continually evolve through internal and external stakeholder regulation. Wider health care structures have to be examined differently to find patterns, which may not be clear using other approaches (Moores, 2010). Innovative companies have to manage complex relationships and communication to be successful at

improvement.

Communicating the value of innovation allows the business to adapt and innovate more quickly and frequently. Moores (2010) suggested different structures in the organization impact multiple agents, technology, and the company's performance when communication breakdowns occur. Similar to Boustani et al. (2010), Moores (2010) recommended technology transformation creates difficulties for health care businesses because of the rapid changes in the business environment. Moores (2010) further found flexibility in external relationships sustains lower cost strategies and increases the business efficiencies. Continuous development techniques increase performance and create sustainability (Kirchmer, Gutiérrez, & Laengle, 2010). New methods improve the company's ability to respond quickly in a highly unpredictable environment.

For health care organizations to reach their innovative potential, they have to balance chaos and stability (Carlisle & McMillan, 2006). Similarly, Karwowski (2012) suggested change doubles every decade in the mist of complexity and chaos and affects the company's ability to adapt to constant change. Mukherjee (2008) echoed complexity creates new structures within health care organizations. Health care organizations cannot dismiss technology continues to advance, change, and evolve.

EHRs transfer massive amounts of data between numerous entities in complex healthcare systems (Tilbury & Ryan, 2011). Merali, Papadopoulos, and Nadkarni (2012) suggested emerging HIT have given rise to complexity, dynamism, uncertainty, and unpredictability. Price (2010) also recommended health care businesses must consider the complexity first when implementing electronic health records because they have to be

fully functional and compatible with other systems to be useful. Gonnering (2012) found health care companies have problems dealing with complexity. Similar to Gonnering (2012), Paina and Peters (2012) suggested leadership and practices influence the implementation of HIT in complex health care systems. Innovation challenges organizations to understand the complexity, so they recognize how the new system fits in, and sometimes organizations uncover inefficiencies. Understanding EHRs implementation barriers through CASs produced an opportunity to overhaul health care system problems.

Historical Overview of EHRs

In the late 1990s, citizens wanted more control over out-of-pocket health care costs (Lau et al., 2012). For this reason, preferred provider organization (PPO) plans became accepted more than the traditional health maintenance organization (HMO) and managed care organization (MCO) plans. Freedom to choose providers becomes necessary for quality of care (Lau et al., 2012).

In 2008, the Bush administration presented a way to get all health records digitized as an attempt to modernize the U.S. health care system (Goldman, Dube, & Lapane, 2010). By 2010, the Patient Protection and Affordable Care Act (PPACA) brought the expansion of insurance coverage, cost control, and prevention of fraud (Gable, 2011). The PPACA helps to reduce overspending and waste through fraud detection abuse (Gable, 2011). The sustainability of the PPACA depends on engaging patients and physicians (Tripathi, Delano, Lund, & Rudolph, 2009). However, many specialists oppose managing a patient's complete health care needs (Lorenzi, Kouroubali,

Detmer, & Bloomrosen, 2009). Specialists do not want be the patients' sole provider, so there are disagreements between the PPACA regulators, the PCPs, and specialists (Lorenzi et al., 2009).

The American Recovery and Reinvestment Act (ARRA) is an incentive program to motivate the health care industry to increase EHR systems adoptions (Jain, Seidman, & Blumenthal, 2011). Over a five-year period, physicians who purchased and implemented EHR systems received reimbursement payments of $41,000 because of the ARRA (Jain et al., 2011). The Centers for Medicare & Medicaid Services (CMS) also set standards to govern the disburse payments (Blumenthal, 2009). HITECH is a member of the AARA and involves an extensive commitment to implementing HIT. Additionally, the HITECH Act promoted the adoption of EHRs and included $30 billion in incentives for Medicare and Medicaid providers to improve the quality of patient care, decrease costs, and move the short-term economy (Brady et al., 2012).

Spending growth continues to be the main driver for innovation, technology changes, and sustainability in the health care sector (Kumar & Bauer, 2011). Policy makers continue to communicate the importance of the dissemination of EHRs technology by 2015, provided health care providers and organizations adopt HITs (Shin, Menachemi, Diana, Kazley, & Ford, 2012). However, EHR adopters face many challenges, and the main obstacle is guaranteeing the inclusion of primary care clinics in the financial incentives (Brady et al., 2012). Health care leaders and policy makers understand the HIT can improve the overall health care system (Mitchell, Williams, Brennan, & Umscheid, 2010).

Health care reform continues to require health care providers to adopt EHRs as a strategy to increase the exchange of patient health information (Wilkins, 2009). Today, health care companies that offer the lowest cost of high-quality health care can transform themselves to become more sustainable. Cost control and cost structure efforts improve health care practices through cost reduction. Health care companies have to increase their knowledge and build strong capabilities to sustain themselves (Channon et al., 2012). HIT is must for modern day health care (Serbanati, Ricci, Mercurio, & Vasilateanu, 2011) because the environment in which the health care providers position their companies for success has become increasingly demanding (Ludwick & Doucette, 2009).

Changes in the health care environment the last 20 years as a way to reduce rising medical costs shifted the delivery of health care favoring outpatient care more than inpatient and specialty care over primary care (Tang & Hammond, 1997). Primary care clinics and PCPs have grown to be the main providers of health care (Tang & Hammond, 1997). Primary care plays an essential role in a managed health care system and is an integrated health care delivery system of service providers, and medical providers to produce a variety of health care needs (Tang & Hammond, 1997).

Regulators and payers continue to demand reduced health care costs and better quality care outcomes and have increased the need to adopt EHR systems as a way to capture, manage, and analyze medical information from different sites (Tang & Hammond, 1997). The Institute of Medicine (IOM) reported that the digital patient records are an essential IT for health care (Shapiro, Mostashari, Hripcsak, Soulakis, & Kuperman, 2011) because EHRs can improve patient safety and increase the quality of

care. However, new EHR technology is expensive (Kasiri et al., 2012) and the number one reason most health care practices do not always adopt HIT (Kreps & Neuhauser, 2010).

Electronic Health Records

The terms EMR and EHR are interchangeable (Boonstra & Broekhuis, 2010). EMRs and EHRs are patients' computerized medical records created by hospitals and physician offices (Bennett et al., 2012). EMRs and EHRs allow stakeholders to share medical advice effortlessly and permit medical advice to follow a patient throughout various places of health care (Gajanayake, Iannella, & Sahama, 2011). The stakeholders are consumers, health care providers, insurance payers, and government (Thornewill, Dowling, Cox, & Esterhay, 2011).

The functionalities of EMR and EHR systems are patient demographics, financial information, and clinical data storage (Savage, 2012). Other functionalities are medical notes, documentation, trouble lists, and sensitivity outlines. EMR and EHR systems can electronically prescribe drugs, catch medication errors and alert physicians about allergies and drug interactions (Savage, 2012). EMR and EHR allow easy access to other electronic health data exchanges, such as specialized health care providers, pharmacies, laboratories, and hospitals. EMR and EHR increase management's initiatives for improving quality health information collection (Savage, 2012).

It is not easy to adopt EMR and EHR systems (Hoffman & Podgurski, 2011). The costs associated with inadequate systems and medical record mistakes are billions annually (Jain et al., 2011). Insufficient systems are the result of computer issues,

network issues, data entry errors, and software programs are not performing to professional needs (Cresswell & Sheikh, 2012). Adler-Milstein and Bates (2010) stated continuous use of paper charts is also a dangerous consequence of an EMR or EHR system in an electronic environment.

EMR and EHR adoption contribute to the increasing amount of IT jobs in the health care field (Steinfeld & Keyes, 2011). The average cost for an EMR or EHR system evaluation, equipment, and training are about $50,000 to $75,000 (Asoh & Rivers, 2010). However, primary care clinics earn their investment back in about five years (Carayon, Smith, Hundt, Kuruchittham, & Li, 2009). Reduced drug expenditures are the biggest portion of the savings, which support the health care industry to provide reasonably priced health care to individuals (Hoffman & Podgurski, 2011).

Digital Medical Records

Digital medical records (DMRs) are a database of electronically maintained health information of a person's health history (Weir et al., 2011). DMR replaces paper-based medical records (Adler-Milstein & Bates, 2010; Fernández-Alemán, Señor, Lozoya, Tova, 2013). The health industry embraces specific medical information models with a variety of acronyms: (a) CMRs, (b) DMRs (c) EHRs (d) EMRs, and (e) PHRs (Kumar & Bauer, 2011). All of these aforementioned medical records increase in complexity over time (Kumar & Bauer, 2011).

The health care business started digitizing health information over a decade ago (Haux, 2010). Advancements in the Internet and computer systems influenced the development of HITs (Lee & Meuter, 2010). In the mid-1990s, comprehensive HIT

products rarely existed, especially ones that combined data processes (Weiner & Embi, 2009). By the late 1990s, seven organizations used DMRs. The Departments of Defense and Veterans Affairs and four hospitals had higher DMR systems (Tang & Hammond, 1997; Weir et al., 2011).

Advocates of health care quality improvement wanted to see the value of DMRs expanded (Ahern, Woods, Lightowler, Finley, & Houston, 2011). In the 1990s, the IOM also recommended health care providers and health insurances adopt digital patient records as the standard for any medical-related care (Fetter, 2009). HITs provide the health care industry ways to access and store large amounts of medical information using less storage space. HITs provide many health care providers access to essential health information from different locations (Savage, 2012).

DMRs help other systems capture, store, process, communicate, and protect health information at multiple locations (Tansel, 2013). DMR systems reduce cost and improve patient care quality through informed health care by removing repeated testing and medical care by more than one health care provider (Schneider, 2010). DMRs change the management of patient health records (Serbanati et al., 2011). Organizations need innovation to compete, but are skeptical when they are unsure of the outcomes.

For decades, paper records documented medical treatments pertaining to patient health history (Peterson, Ford, Eberhardt, Huerta, & Menachemi, 2011). Today, EHR systems perform administrative tasks, financial tasks, and as a support tool for clinical decision-making (Bennett et al., 2012). The health care industry recognizes computers as an efficient way of collecting, storing, and transferring data (Puentes, Roux, Montagner,

& Lecornu, 2012). However, the health care industry is not sure what components digital health records need (Millard, 2010).

Patient Safety

In 1999, the IOM reported hundreds of thousands suffered injuries each year because of medical errors and 40,000 to 98,000 people died (Grout & Toussaint, 2010). In 2001, The Committee on Quality of Health Care in America (CQHCA) reported improved quality of health care reduces medical mistakes (Weinberg, Cooney-Miner, Perloff, Babingtion, & Avgar, 2011). Creating an environment that promotes quality of care involves (a) construction of infrastructure to support health care practices, (b) the use information technology (IT), (c) monetary incentives, and (d) training the workforce to provide enhanced quality of care in a society of growing awareness and rapid change (Weinberg et al., 2011). The recommendations caught the attention of the medical community (Weinberg et al., 2011).

More patient safety strategies developed out of the release of the 1999 IOM report. One of those strategies included electronic prescribing known as eRx (Grout & Toussaint, 2010; Kaushal, Kern, Barron, Quaresimo, & Abramson, 2010). The eRx strategy required EHR systems to accommodate the administration of medicines within the health care policy. Additionally, eRx captures the patients' full prescribing history, which was transferable. The use of databases and decisions support tools assisted the doctor in treatment selection (Friedman, Schueth, & Bell, 2009). Health care professionals believed the eRx systems would increase efficiency, accuracy, and appropriateness of the medication prescribed (Grout & Toussaint, 2010; Kaushal et al.,

2010).

Goldman et al. (2010) conducted a study to examine eRx software refill functionality. The study subjects described their refill experiences with the eRx software and suggested improvements (Dube et al., 2010). The results were a 50% drop each day spent on refilling prescriptions (Dube et al., 2010). Additionally, the participants of the study (a) identified any malfunctions or difficulties associated with the eRx software, (b) noted time savings and patient convenience as an eRx software support, and (c) valued the capacity to track whether patients were filling and refilling prescriptions (Dube et al., 2010).

The primary care clinics capabilities increased in United States with the use of eRx from 11.4% in 2000–2001 to 21.9% in 2004–2005 (Pagan, Pratt, & Sun, 2009). The differences in the rates of eRx adoption across medical practice settings and specialties remained constant (Pagan et al., 2009). The interest in the use of technology to improve clinical decision-making also grew as functionality the eRx system expanded, (Pagan et al., 2009).

Clinical Decision Intelligence

A further recommendation from the IOM was to improve clinical decision intelligence (CDI) to develop health policy, the quality of care and discover new treatments (Moore & Cagle, 2012). CDI covers a wide range of health care subjects from knowledge management, remote data integration and analysis, and software development (Bennett et al., 2012). CDI also supports decision-making through an in-depth analysis of multiple sources of clinical data (Hasley, 2011). These sources of information are clinical

practices, health care management, administration, and health care research (Haas, Wohlgemuth, Echizen, Sonehara, & Muller, 2011).

Hasley (2011) stated during patient care clinical decision support systems (CDSS) affect the doctor's behavior. As EHR adoptions increase so will CDSS within primary care clinics in the United States (Moore & Cagle, 2012). Dreischulte and Guthrie (2012) reported CDSS increased quality guidelines compliance of health care and reduced medical errors. Enhanced health care quality, improved patient safety, expert information processing, and decreased expenditures are the benefits of health information systems (Forni, Chu, & Fanikos, 2010). The CDSS overall goal is to maximize patient care efficiency (Wanderer, Sandberg, & Ehrenfeld, 2011).

EHR systems also included other patient care functions, such as chronic disease management systems (CDMSs). CDMSs capabilities are not always proficient at disease management (Walters, Adams, Mieboer, & Bal, 2012). However, as more health care providers move toward EHRs implementation, the use of CDMSs increases (Walters, Adams, Mieboer, & Bal, 2012). Both EHR and CDMS promote health care providers in enhancing a patients' quality of care (Lluch, 2011). EHR software supports the following prebuilt or customized CDMS functions (a) decision support for various diseases and conditions, (b) alerts, and reminders, (c) eRx, (d) health education materials, (e) medical encounters documentation, (f) medical decision support, (g) reporting, and (h) health care protocols and guidelines (Gold et al., 2012). Although EHR functionality promises to improve patient care quality, they have also resulted in inconsistent terminology (Berman et al., 2013).

Health Information Exchanges

HIEs are the development of electronic health information between organizations according to a set of values. The HIEs health information distribution includes radiology and laboratory results and problem lists, and medication history (eHealth Initiative, 2012). The health information is in the form of electronically prepared data of information pertaining to a patient's health care and status (Deas & Solomon, 2012). In 2011, there were 39 HIEs sustainable out of 85 (Deas & Solomon, 2012). The Indiana Health Information Exchange (IHIE) in Indianapolis and Northwest Health Services (INHS) in Spokane, Washington are two HIEs distinguished for longevity and healthy growth (Deas & Solomon, 2012). IHIE is the biggest HIE company in the United States with more than 18,000 physicians linked to its business who share 3.5 million EHRs of patients (Deas & Solomon, 2012).

Lenert and Sundwall (2012) said the investment in health information exchange between every health care provider through a national HIE has steadily increased. The federal and state governments formed partnerships with HIT organizations to establish standards and testing interoperability of the HIE (Frisse, 2010). There are many benefits for providers who have unlimited access to secure and protected health information, but 100% of all health care providers must adopt an EHR system and HIEs to be successful (Gold et al., 2012). HIEs do improve the safety and cost of medical care delivery by transporting the correct information to the proper person at the right time. HIEs' reduces security errors up to 18% and detrimental drug events across the health care industry up to 70%. Additionally, health information exchanges reduce health care costs up to $78

billion in the United States by reducing unnecessary medical tests and procedures (Dixon, Jones, & Grannis, 2013).

A majority of physicians reported HIEs slightly or substantially improve health care quality, which included relations with other medical doctors, care management for their patients, expertise within their practice, and complete, and accurate health records (Patel et al., 2011). However, only 56% of medical doctors considered HIEs somewhat or significantly improves the confidentiality and security of a patients' medical information (Patel et al., 2011). Financial problems were the main barriers reported by physicians when deciding to adopt HIEs. Others reported start-up expenses, ongoing expenditures, and financial returns on investments as obstacles to adopting and using HIEs. Physicians did not see the HITs or patients consent as a significant barrier for HIEs (Patel et al., 2011).

For HIEs to be sustainable, the states and federal government have to consider ongoing financial support. There need to be procedures in place to regulate the exchange of health data. There should also be coordination and liability limitations implemented nationwide, so the organizational danger of joining HIEs does not exceed the payback. HIE development and promotional efforts in the early stages need to focus on potential benefits and manage organizational apprehensions (Pevnick et al., 2012). HIEs do improve the safety and cost of medical care delivery by transporting accurate information to the correct person at the right time. HIE reduces security errors up to 18% and detrimental drug events across the health care industry up to 70%. Additionally, health information exchanges reduce health care costs up to $78 billion in the United States by

reducing unnecessary medical tests and procedures (Dixon et al., 2013).

Efforts to Increase the Use of EHRs and HIEs

Jain et al. (2011) concurred Medicare and Medicaid providers need incentives not only for adopting electronic health records, but for improving quality, efficiency, and security also to reduce health inconsistency, and the enhance care coordination of personal health information. The Certification Commission for Health care Information Technology (CCHIT) estimates there are more than $703 million incentive programs to encourage physicians to adopt EHR systems (Kan, 2011). Examples of these programs are 18 billion in Medicare and Medicaid reimbursement enticements for hospitals and medical doctors who use EHR systems meaningfully (Gold et al., 2012). Two billion dollars went for infrastructure to the Office of the National Coordinator to promote the exchange and use of electronic health information for each person in the United States. It allowed the electronic flow of information, integrating HIT training of health care employees, and to improve interoperable clinical data repositories, and one billion for the acquisition of HIT systems and transformation of health centers (Gold et al., 2012). There are 550 million to purchase HIT equipment and services, and 400 million for efficiency studies on how electronic health information impacts approaches health care management, and 300 million to assist local and national HIEs (Gold et al., 2012).

The CMS demonstration program includes 12,000 practices in two phases. The use of CCHIT certified EHRs to meet quality standards, with financial incentives and bonuses of up to $58,000 per physician or $290,000 per office for five years by using the $150 million of funding initially allocated for the program (CCHIT, 2013). Quality

measures are tools to quantify health care processes, outcomes, patient perceptions, organizational structure, and systems associated with providing high-quality health care (CCHIT, 2013). Additionally, CareFirst BlueCross BlueShield started an incentive system for physician groups who perform certain measures of quality (CCHIT, 2013). Medical practices can earn 7% more than the fee plan by using CCHIT certified EHRs under this program (CCHIT, 2013). CCHIT also launched a new initiative in 2008 to validate operational HIEs in 2009 to encourage participation in HIEs (CCHIT, 2013). All safety requirements must be met by certified HIEs (CCHIT, 2013).

Health care organizations struggle with the implementation and development of appropriate EHR systems. Increased use of HIT capabilities has resulted in frequent potential dependent systems (Vessey & Ward, 2013). The complexity of EHR development lies within the number of systems interconnects (Mittal, 2013). HIT management needs to incorporate sound systems of development. Hence, EHR adoption should use sustainable strategies to reduce problems. Sustainable improvements create new structures and new ways of operating. Innovation achieves sustainability (Mitleton-Kelly, 2011). HIT management is crucial to EHRs adoption success and an indicator for behavioral attitudes with technology deployment functions (Mitleton-Kelly, 2011). Innovations in EHRs and HIEs are an essential part of needed changes and are dependent on one another (Mitleton-Kelly, 2011).

Adoption of Electronic Health Records

There have been numerous research efforts on the number of health care providers to use electronic health records (DesRoches et al., 2008; Gold et al., 2012; Jamoom et al.,

2011; Miller & Sim, 2004; Zandieh, Yoon-Flannery, Kuperman, Langsam, & Kaushal, 2008). Hoffman and Podgurski (2011) stated health care practices seek out opportunities to improve the EHR systems efficiencies, reduce medical errors, and improve health outcomes through health information technology. Adopting EHR systems decreases health errors improves health care quality for patients and saves billions of dollars (Dixon et al., 2013). The implementation of the EHR systems also reduces paper costs, operational cost, malpractice suits, and expands health service availability (Adler-Milstein & Bates, 2010). Even with the best design and conditions, EHR adoption, implementation, and use remain challenging.

The National Ambulatory Medical Care Survey (NAMCS) reported EHR uses rates remained relatively unchanged in the early to mid-2000s from 17% to 20% among office-based providers. NAMCS studies ambulatory care at physicians' offices (Jamoom et al., 2011). However, EHR uses increased significantly in 2011 by 29.6% (Gold et al., 2012; Jamoom et al., 2011). Despite the vast number of research in the health care sector, there is little information on overcoming barriers to implementing EHRs at rural primary care clinics. Numerous reports did show EHRs positively or negatively impact rural health care practices (Aarts, 2012; McCullough, Casey, Moscovice, & Burlew, 2011; Brady, Sriram, Lide, & Roberts, 2012).

The results of the *New England Journal of Medicine* nationwide survey in 2008 of 2,758 physicians provided clearer estimates of the EHRs adoption rate (DesRoches et al., 2008). In the investigation, 13% of the contributing physicians reported possessing a basic EHR system while 4% only reported using a fully functioning EHR system.

Physicians in larger practices, hospitals, or medical centers use EHRs (DesRoches et al., 2008). Additionally, the study showed physicians who utilized a fully functioning EHR system experienced 82% increase in clinical decision quality. The communication with other health care providers increased at 92%. Contact with patients rose by 72%. Accuracy in prescription refills increased to 95%. Access to health information was quicker access at 97%, and medical errors decreased by 86% (DesRoches et al., 2008)

In 2008, Liong et al. conducted a qualitative, phenomenological study to explore and explain lived experiences of nurses using EHRs (Liong et al., 2008). The researchers interviewed a purposive sample of 14 nurses to collect the data until the point of saturation and redundancy (Liong et al., 2008). Three emergent themes arose from the data from the meanings of the participants' descriptions: (a) Dimensions of EHR Influence, (b) Phases of EHR Experiences, and (c) Future Improvements (Liong et al., 2008). Additionally, 12 subthemes supported the three emergent themes found in the data (Liong et al., 2008). The researcher used (a) descriptive vividness, (b) methodological congruence, (c) analytical preciseness, (d) theoretical correctness, (e) heuristic relevance, and (f) criteria of trustworthiness to determine the truth-value and scientific rigor of the study (Liong et al., 2008). Liong et al. (2008)also acknowledged EHRs shortened documentation time, reduced patient care time and increased work efficiencies, improved patient safety, and communication between health care personnel, and access to health information (Liong et al., 2008). The nurses believed EHRs positively affect the quality of patient care and the overall safety of health care (Liong et al., 2008).

In 2008, Zandieh et al. utilized a qualitative study to examine paper-based

ambulatory care practices and other practices with either an established or a newer EHR system. Eleven health care office managers and 12 medical directors from an academic ambulatory care system at a teaching hospital in New York City contributed to the five-month study (Zandieh et al., 2008). The study compared and contrasted the challenges and benefits of EHRs implementation at ambulatory care practices using paper-based charts and other practices with either an established or more modern EHR system. The findings showed leaders using paper-based charts prioritized (a) sufficient workstations and printers, (b) a physician as an IT champion at the practice, (c) workflow education made the transition from a paperless to an automated medical practice more profitable, and (d) a high comfort level existed in practitioners with an IT support staff (Zandieh et al., 2008). Additionally, the findings showed leaders using EHRs prioritized (a) enhanced specialized training and ongoing technical support, (b) adequate protection of patient privacy, and (c) recognition of the doctor resistance (Zandieh et al., 2008). Leadership at paper-based practices has different concerns on adopting new HIT than EHR-based practices (Zandieh et al., 2008).

In 2010, 54% of physicians adopted EHRs and 46% did not (Jamoom et al., 2011). The dissimilarities between EHR non-adopters and adopters were by company size, age, and specialty (Jamoom et al., 2011). Doctors over the ages 50 were less likely to adopt EHRs than physicians under 50 (Jamoom et al., 2011). Larger practices were more likely to adopt EHRs than smaller ones (Jamoom et al., 2011). Larger physician practices of 2 to 10 were more likely to adopt EHR systems than one third of medical doctors in solo practices (Jamoom et al., 2011). Medical practices of 11 physicians or

more were three times as likely to adopt EHR systems. Physicians employed by HMOs, hospitals, and health centers were likely to have EHR systems (Jamoom et al., 2011). Forty-seven percent of medical doctors who already had EHR systems reported being reasonably happy and 38% more satisfied. Seventy-four percent of the EHR adopters understood the EHR system enhanced their quality of care (Jamoom et al., 2011). Additionally, non-adopters reported they want to adopt a simple EHR system in the next 12 months. These findings suggest federal policies and incentives increase EHR adoption (Jamoom et al., 2011). In 2010, a National Center for Health Statistics Survey EHR adoption rates at medical practices with a simple EHR. The analysis contained lower rates of EHR adoption rates of 24.9% (Jamoom et al., 2011).

In 2011, Shapiro, Mostashari, Hripcask, Soulakis, and Kuperman conducted a study to evaluate EHR adoption barriers and measures to overcome them at primary care practices. The measures of the study were barriers to EHR implementation, how to overcome them and adoption rates. EHR adoption rates associated with the organization's size were about 57.9%. Larger physician practices were more likely to adopt EHR systems, and single physicians or smaller physician practices were less likely to adopt EHR systems (Shapiro et al., 2011). Financial reasons were the main barriers to implementation, and financial incentives were a way to beat the EHR adoption barriers (Shapiro et al., 2011). Shapiro et al. (2011) also noted adoption would level off at around 68% within the next four years because of the transition to EHR systems, the automation of business workflow processes, and technology advancements. Health care practices will have to adjust their processes after the implementation of EHR systems (Gorli, Kaneklin,

& Scaratti, 2012).

Gold et al. (2010) also reported the following reasons for the slow EHR adoption by health care professionals (a) primary care declining income, (b) slow workflow, (c) capital constraints, (d) integrating files from multiple sources, and (e) ongoing technical support (Gold et al., 2012). By 2011, the strongest EHR adoption rates were in larger practices and less than 29.6% of primary care practices adopted a simple EHR system (Gold et al., 2012). Physicians who reported using a simple EMR or EHR increased by12% from 2010 to 2011. The EMR or EHR systems adoption varied significantly by the business and state (Jamoom et al., 2011).

HIPAA Compliance Challenges to Adoption

As more health records transfer to digital form, the security of patient health information is a grave concern (D'Arcy & Herath, 2011). Fichman, Kohli, and Krishnan (2011) acknowledged the public fears breach in health information and questioned the effectiveness of security practices. Accomplishing health information security entails developing competencies, such as firewalls and intrusion detection systems. It also involves aligning social systems, such as security policies, procedures, and training programs, which communicates roles and responsibilities to the users (Kayworth & Whitten, 2010).

Prior studies suggest management plays a crucial factor in HIPAA security agreement (Brady et al., 2012). The organization's culture should maintain confidentiality policies and practices to increase safety awareness and encourage EHR users to act responsibly (Brady et al., 2012). HIPAA security agreement also requires

security awareness and healthy organizational culture (Brady et al., 2012).

Factors Affecting Physician Acceptance

The physician and patient trust relationship played a vital part in the adoption of EHRs (Shield et al., 2010; Zheng, Padman, Krackhardt, Johnson, & Diamond, 2010). Physicians tend to avoid disrupting a patient trust, so they steer clear of EHR activities, which violate patient privacy (Ruotsalainen, Blobel, Seppala, Sorvari, & Nykanen, 2012). When patients trust their medical doctor, they are more likely to follow therapeutic plans, see their medical doctor more often, and recommend physician to others (Carver & Jessie, 2011). Informational and emotional support is essential in physician-patient trust relationships. Physicians should actively engage patients in the benefits of EHRs and address their questions and concerns (Banerjee & Sanyal, 2012). Physicians also have to trust HIT vendors to be a reliable EHR partner in protecting the security and privacy of their patient's health record, and advocate responsibility to their patients (Shield et al., 2010).

In 2008, Morton developed a technology acceptance model (TAM) model as a framework to assess physicians' attitudes related to EHR readiness for implementation from survey data. Morton (2008) noted there were limitations concerning the conclusions on the quantification of subjective behavioral and attitudinal constructs associated with decision-making. Morton also recommended for future studies using a qualitative method, which better represents behavioral and attitudinal constructs associated with EHR adoption because these constructs are by nature based on a constructivist epistemology.

EHR and HIE Adoption Barriers

Problems with EHRs and HIEs often lead to high failure rates because of the complexity of using these systems to collect and move large amounts of health data (Sicotte & Paré, 2010). Health care businesses need to take advantage of the EHR and HIE benefits and try to reduce risks when using them by figuring out the best way to approach their adoption and implementation process (Lluch, 2011). Any decisions to adopt EHRs or HIEs could result in an unintended consequence, especially at rural primary care clinics. Investigators have recognized obstacles to adopting EHRs (a) financial investments, (b) concerns about confidentiality, and (d) challenges in exchanging information electronically (Hatton et al., 2012; Hunter, 2011; Sicotte, & Paré, 2010).

Financial Barriers

A number of physicians perceive EHRs as hard to use and expensive (Ajami, Ketabi, Isfhani, & Heidari, 2011; Loomis, Ries, Saywell, & Thakker, 2002). EHR adoption costs also seem to affect smaller health care providers more (Adler-Milstein & Bates, 2010). For this reason, high costs, such as ongoing maintenance make the EHR system more risky for some providers because the costs may be too expensive (Lluch, 2011).

The financial barriers to adopting EHRs are the costs of acquiring and executing EHR systems and the cost of ongoing maintenance, and adjusting the workflow to the new technology (Hunter, 2011; Lluch, 2011). Financial barriers also include finding a way to meet the practice's needs, and the product lifecycle (DesRoches et al., 2008; Walji

et al., 2013). Other financial barriers are high startup costs, uncertain investment returns, patient and physician visit time costs, lack of technical support, technology difficulty, lack of incentives, and the medical doctor's attitude toward adopting EHRs (Horsky et al., 2010; Miller & Sim, 2004). Concerns about patient health information privacy and security were also barriers for some physicians (Jain, Seidman, & Blumenthal, 2011).

Privacy and Security Barriers

Authorized users need health information to be readily available (Fetter, 2009). However, concerns about the safety and confidentiality of a patient's medical information increased with the use of EHR systems (Patel et al., 2011). These concerns include preventing unauthorized entrances to a patient's medical record and ensuring patient privacy (Fernández-Alemán et al., 2013). Physicians should not disclose personal information to others unless the patient knows and consents to the disclosure. Integrity with EHR adoption is necessary because data impacts health care quality (Haas et al., 2011).

There have been numerous debates on the competency of HIPAA to protect medical information (Rothstein, 2010). There are different stages of privacy threats: (a) guiltless mistakes and accidental discovery caused by insiders, (b) authorized users intentionally accessing information for monetary gain or malice, (c) an illegal intruder, and (d) revengeful workers or intruders who disrupt the organization by mistreating information or destructing systems (Rothstein, 2010). Secondary consumers who receive, process, and obtain health information, such as HIT industries, public health organizations, third-party payers, and insurance corporations also threaten the privacy

(Rothstein, 2010). The efforts of many organizations, both private and public, have identified privacy concerns of personal health information as barriers to the adoption of EHRs and the development of HIEs (Greenberg, Ridgely, & Hillestad, 2009). Undoubtedly there is a strong need to keep the confidential of a patient's health information (Patel et al., 2011). It is clear many challenges curb the spread of EHRs.

Electronic Data Exchange Barriers

The exchange of electronic information plays a large role in business and personally (Adler-Milstein & Bates, 2010). HIEs exchange electronic health information between organizations according to a set of values (eHealth Initiative, 2012). The information is in the form of electronic health data pertaining to a patient's health care and status (Deas & Solomon, 2012). Repeatedly electronically communicated data is incomplete (Ross, Schilling, Fernald, Davidson, & West, 2010). The elevated use of electronic health records in health care settings causes a weakness in standards and other various challenges (Ajami et al., 2011). Electronic health records enable health information to go through several insurers, providers, and software programs (Ajami et al., 2011), so there need to be standards for to support the development of health information systems on a nationwide level (eHealth Initiative, 2012).

Change Resistance Barriers

During organizational transformation, there is always resistance to change regardless of the business type. Del Val and Fuentes (2003) surveyed many Spanish companies dealing with the development process. The population was a random sample of two companies with more than 50 employees undergoing the development process.

There were 86 valid answers obtained from the study. The first groups of experts were university staff, many business people, and three individual managers. The questionnaire collected data to test the hypotheses (Del Val & Fuentes, 2003). The first hypothesis was to test the observable resistances to change in the empirical research. The following hypothesis was to test the resistance to change using strategic or evolutionary changes as a continuum. The authors used strategic and evolutionary to explain the resistance to change: (a) highly strategic is where there has been a radical change, and the company is not same as before, and (b) extremely evolutionary were they modified certain aspects of the organization, and the organization remains the same (Del Val & Fuentes, 2003). Respondents indicated their position among five points of the continuum. Descriptive analysis supported acceptance of the hypotheses (Del Val & Fuentes, 2003). Resistance to change is more powerful in strategic changes than in evolutionary changes (Del Val & Fuentes, 2003). The data suggests radical and transformational change is more resistance and deeply rooted values make change difficult for organizations (Del Val & Fuentes, 2003). A strong culture of loyalty and cohesion as fundamental values limits innovation by, not allowing the existence of unruly people inside the company (Del Val & Fuentes, 2003). Smith (2011) acknowledged unsuccessful transitions fail during one of the subsequent phases. The first phase would be generating a sense of urgency. The second phase is establishing a powerful guiding coalition. The third phase is developing a vision, communicating the vision clearly. The fourth phase is removing impediments, planning and producing short-term wins, avoiding premature pronouncements of victory, and the fifth phase is embedding changes in the corporate culture (Smith, 2011). Buchanan et al.,

(2005) said radical transformation creates people issues because of leadership and job changes. Resistance to change can delay or eliminate the success of organizational change, so leaders should address all anxiety issues during the development process (Buchanan et al., 2005). Resistance happens when people do not understand the change. Successful change requires (a) unfreezing the present level, (b) moving to a new level, and (c) freezing on a new level (Buchanan et al., 2005).

Change research also reveals many companies have problems achieving change, sustaining change, and unanchoring old ways to make room for innovation (Woodard & Hendry 2004). Change in organizational structures, policies, and processes cause resistance (Gold, 1999). Organizations must understand there is a need or change for change to be successful, or transformation becomes difficult if there are few needs. If there are high needs, then there is little or no resistance when initiating change (Burke, 2011). Change creates tension and resistance (Burke, 2011). Burke (2011) and Gold (1999) alleged people have to participate, organizations have to reeducate, and new behaviors have to become the norm for the development to be sustainable. Gold said successful development depends on collaboration and effective communication between those who have a stake in the outcome and engage directly in development efforts. Regardless who initiates change it cannot take place unless everyone is on board (Burke, 2011). Gold also recognized the pressure to change comes from several positions, and not just leaders.

Organizations fail to understand the benefits of implementing new IT because of the implementation barriers. New technology benefits the company in the long run, but it

effects of development in the short term causes resistance to organizational structure, policies, and business processes (Gold, 1999). Peansupap and Walker (2005) said insufficiency IT adoption strategies may result in low adoption rates, ongoing issues during IT implementation, which includes slow and ineffective diffusion because users experience technical difficulties. It also may result in negative users perceptions towards using IT and lead to resistance. Organizations that lack articulated IT adoption policies may face numerous implementation problems (Peansupap & Walker, 2005).

Solutions to Encourage EHR and HIE Adoption

Health care is not an isolated incident confined to an organization or even health care delivery system anymore. Health information is available from health care providers' nationwide through a HIE exchange. Health care organizations need a deeper understanding of EHR and HIE solutions for acceptance. Solutions for adopting EHRs and HIEs are (a) financial barrier solutions, (b) privacy and security barrier solutions, (c) EHRs and HIEs barrier solutions, (d) standard barrier solutions (eHealth Initiative, 2012), and (e) change management solutions (Buchanan et al., 2005).

Financial Barrier Solutions

Three approaches can help manage uncertainty about the cost of buying and implementing EHR systems, the cost of ongoing maintenance, and adjusting the workflow to new technology. Number one is financial incentives offset the cost of purchasing, implementing, and educating employees on using EHRs (Kan, 2011). Number two is EHR certification ensures the product meets all the standards, which reduces the time needed for research on EHR purchasing (CCHIT, 2013). Finally,

number three is developing Software as a Service (SaaS) or Application Service Provider (ASP) models to reduce storing and data accessing costs (CCHIT, 2013).

There were billions of dollars in incentive payments allocated within the federal stimulus legislation for providers to adopt and use EHRs technology (Ahmad & Tsang, 2013). Health care facilities have to implement, execute and use a certified EHR meaningfully to receive incentive payments (Jones, Heaton, Friedberg, & Schneider, 2011). Shin et al. (2012) affirmed health care providers would incur fines of 2% if they do not comply by 2015.

The formation of the CCHIT in 2004 addressed standards for certifying EHR systems (CCHIT, 2013). Since 2006, the CCHIT established sufficient ability definitions for EHR systems (CCHIT, 2013). EHR certification is an essential part of U.S. Department of Health and Human Services (HHS) plan for changing the health care industry through extensive EHR adoption. EHR certification increases EHR marketplace transparency and reduces the risk for health care providers who buy and implement EHRs (CCHIT, 2013). EHR certification decreases the risk of buying an out-of-date system because the CCHIT ensures certified products meet the needs of all health care providers (CCHIT, 2013). EHR certification helps health care providers deliver high quality, protected, cost-efficient, and functional health care (CCHIT, 2013).

The need to reduce costs encouraged several EHR vendors to distribute applications using software models such as SaaS and ASPs (CCHIT, 2013). SaaS and ASPs are (a) companies organizing networks for an application, (b) controlling entrance to a packaged application from a central area of different parties, and (c) requiring a

contract to provide applications over networks (Bayrak, 2013). SaaS and ASPs provide rental software to companies that use the applications (Jeong & Stylianou, 2010). SaaS and ASPs are companies that own licensing rights or purchased the rights to software application hosted at their data center (Fan, Kumar, & Whinston, 2009). Physicians can access the software applications from distant places where the service provider operates and maintains the data center on the doctor's behalf (Wu, Garg, & Buyya, 2012).

SaaS or ASP models reduce capital investments and guaranteed performance (Concha, Espadas, Romero, & Molina, 2010). They lower ownership cost and improve access to health information (Concha et al., 2010). Additionally, SaaS or ASP models provide faster execution of medical information because of their widespread access to virtual private network or the Internet, which reduce computer power needs for the PCPs, and reduce maintenance are the benefits of a SaaS or ASP model (Concha et al., 2010). The disadvantages of a SaaS or ASP models are lack of custom applications, data ownership questions, sufficiency of business intelligence tools for querying data, HIPAA compliance, and Lack of software integration (Benlian & Hess, 2011). SaaS or ASP applications allow physicians to lease software and data storage from the service provider for their office (Jeong & Stylianou, 2010). The vendor owns the software and server and maintains it. Software service providers reduce the substantial upfront costs of purchasing EHRs (Fan et al., 2009). The PCP uses the applications as if they licensed and maintained the software and data warehouse. The vendor maintains the provision and security of the system, and the data collected (Concha et. al., 2010).

An EHR system can cost as much as $15,000 to $70,000 per provider, with

estimated ongoing costs (eHealth Initiative, 2012). SaaS or ASP service would offer providers a fixed monthly subscription at a lower cost (eHealth Initiative, 2012). However, customers do not purchase the costs related to IT employees and data center under the service provider model (Concha et. al., 2010).

Privacy and Security Barrier Solutions

The CCHIT developed certification standards to improve the security of EHRs in response to apprehensions about accessing confidential medical information (CCHIT, 2013). The interoperability workgroup developed standards to address access control for users, access to health records, security reviews, user verification, and technological services concerning, backup/recovery, documentation, and encryption (CCHIT, 2013). All CCHIT certified EHRs have to meet set of criteria (CCHIT, 2013).

In 2009, the National Health Information Security and Privacy Collaborative (HISPC) developed solutions and identified best practices to overcome variances in laws, which prevent the expansion of electronic medical information nationally (Rothstein, 2010). The project's goal was to develop policies that promote widespread interoperable electronic HIEs (Rothstein, 2010). By participating in the HISPC project, the participating states identified variations in HIE strategies, advanced solutions and implemented initial privacy and security solutions (Rothstein, 2010).

EHR and HIE Barrier Solutions

For more than nine years, the American Health Information Community (AHIC) has developed recommendations to assist EHR adoption in their meetings (Kan, 2011). They adopted 32 recommendations in 2008 to encourage the adoption goal. Pay-for-

performance programs and utilization of certified EHRs were two of the thirty-two recommendations (Kan, 2011).

In 2012, 88 HIEs reached higher initiative, an increase of 13 since 2011 (eHealth Initiative, 2012). Advanced initiatives demonstrate HIEs is operational, sustainable, or innovation stage of development. These HIE organizations are actively transmitting data between stakeholders (eHealth Initiative, 2012). The state-level health information exchange project (SLHIE), the state of Regional Health Information Organization (RHIO) consensus project provides state-level support to aid in developing (a) policies and procedures, (b) sustainable business plan, and (c) governance when accessing, using, and managing of health data (HRSA, 2011). The state and local HIE efforts help efficiently execute and maintain secure health exchanges (HRSA, 2011).

Standard Barrier Solutions

The primary objective of the U.S. Department of Health & Human Services (DHHS) was to make EHRs universal between health care providers. In 2004, the Stark Law and the Anti-kickback Statutes were two main federal fraud and abuse laws adopted by the Office of the Inspector General (OIG) and CMS for measures involving EHR systems donations (Menachemi, Matthews, Ford, Hikmet, & Brooks, 2009). Regulations prohibited the offering of goods prior to the adoption of these two provisions because of concern for fraud and misuse, which may occur when referral sources provide discounted goods and services (Webster, 2010).

All stakeholders should support a trusted health information exchange (eHealth Initiative, 2012). HIEs have to be flexible enough to support health data exchange laws,

standards, and regulations, but at the same time, not impede innovation (eHealth Initiative, 2012). Health care organizations must govern the current and future needs of EHRs and HIEs (eHealth Initiative, 2012).

Change Management Solutions

Health care organizations implement new technology solutions to streamline business activities, increase efficiency, achieve organizational objectives, and maintain their future (Kumar & Bauer, 2011). New technology opens many possibilities to solve future problems and alleviates spending pressures (Astolfi, Lorenzoni, & Oderkirk, 2012). However, Smith (2011) said leadership is the missing element in many IT implementation development efforts. The importance of change, but also not overstress the risk of failure. Successful organizational change and innovation require strong leadership to develop new concepts of what works and ensure employees will take on new responsibilities (Sarker & Lee, 2003). For IT implementation to be successful, it needs people to be on board because insufficient resources, lack of employee participation, and lack of management support cause IT implementation failure (Sarker & Lee, 2003).

Lewin's advancement of research creates an advantage for IT enabled change (Burke, 2011). Burke (2011) highlights IT implementations are an active topic of change management, but IT researchers failed to recognize it as a change event. Additionally, the change process seems to be risky and vague most of the time. The majority of businesses continue to struggle with inefficiencies as they move through the IT development processes and without an excellent explanation of how companies employ human capital

in the context of IT development (Burke, 2011). For this reason, companies should regularly evaluate their IT investments, implementations, and modified organizational processes or end up with failed IT projects (Burke, 2011).

Internally focused, organizational culture can cause bureaucracy and disempowerment of the change initiative (Smith, 2011). People issues are large contributors to resistance. Engaging employees in change can alleviate problems. All decisions and behaviors influence people and how they understand or make sense of events (Buchanan et al., 2005). Organizational cultures comfortable with change accept, understand, and initiate change. Confident employees view change as exciting rather than trouble (Smith, 2011). Buchanan et al. (2005) said organizations should consider four categories to support sustainable changes. First, the individual employee accepts the risk as a natural response, and accepts change as a learning opportunity, and commits to group decisions and rules. Second, managers manage the complicated or high risk problems. Third, culture does change, and so does the needs of stakeholders. Fourth, sustainability is a lengthy process of implementation and development (Buchanan et al., 2005). Smith (2011) stated successful development is leadership, and management, but the crucial point is the leadership style needs to match the audience. Leaders promote the development process stay in motion by pushing it along. Transformation demands leaders to motivate employees and includes creating a vision and strategy that is consistent with the overall development effort (Smith, 2011).

Successful change management involves systematic transformation of people (Buchanan et al., 2005). Planning and implementation strategies and culture and

communication issues are essential aspects of organizational development and successful change (Buchanan et al., 2005). Smith (2011) acknowledged there are four steps involved in following (a) communiqué of the development vision, (b) generation of short-term wins, (c) consolidation of gains and the creation of more development, and (d) anchoring change in the organizational culture. Smith believes anchoring the change in the organizational culture is the most critical step that takes the longest. Change occurs when it becomes the way we do things around here. New behaviors have to be rooted deep in the norms and shared values of the organization. Sustainable change happens when new ways of doing things and improved results become the norm. When processes and issues change, so do the thoughts and attitudes behind them, also systems change in support. Meaning, it has become mainstreamed rather than something added on (Buchanan et al., 2005).

Transition and Summary

The purpose of the study was to explore overcoming barriers to implementing EHRs. The literature review provided an overview on EHRs as complex systems, historical perspectives on EHRs, plans to promote EHRs, EHR implementation barriers, solutions to increase EHR implementation and adoption.

In the subsequent section, I explain the project and my role as a researcher and justify the use of a qualitative phenomenology study to explore overcoming barriers to implementing EHR from a physician perspective.

In the next section, I describe the justification for the use of a qualitative phenomenology study to explore how rural PCPs and physician assistants' can overcome

barriers to implementing electronic health records.

Section 2: The Project

Section 1 provided a background of the problem, the purpose of research and clear evidence regarding overcoming barriers to implementing EHRs. Section 2 includes the purpose statement, the role of the researcher, the participants, the research strategy and design, the population and sampling, reputable research, data collection, the data analysis technique, and the reliability and validity of the study. Section 3 contains the results, actions, social change, recommendations for actions, and future studies.

Purpose Statement

The purpose of this qualitative phenomenology study was to explore rural primary care physicians, and physician assistants' experiences regarding overcoming barriers to implementing electronic health records. The targeted population was 20 or more rural PCPs and physician assistants located at primary care clinics in the southeast region of Missouri. This population was appropriate for the study because research suggests less than 30% of rural primary clinics have fully functional EHR systems (Goldberg, 2012). The implication for positive social change included the potential to provide cost efficient health care services for a more sustainable future (Channon et al., 2012).

Role of the Researcher

My part in the qualitative phenomenological study was to collect data from rural PCPs and physician assistants without prejudice at rural primary care clinics. Chenail (2011) proposed a researcher's role is to understand and learn from lived experiences. Additionally, Turner (2010) said a qualitative researcher should use his or her strengths to describe lived experiences and perceptions through a written research report. Patton

(2002) supposed a qualitative researcher solely collects data, which differs from a quantitative researcher who is not a data collection instrument. Turner (2010) stated the rich data and detailed feedback collected from participants support qualitative phenomenological research.

I completed the National Institute of Health (NIH) web-based training course, "Protecting Human Research Participants," exhibiting my knowledge of the research process and ethical behavior. Additionally, I am an active member of the National Registry of Certified Medical Assistants, and I read medical articles on a monthly basis as a requirement for continued educational credits for my medical assistant licensure. As a medical assistant and home health case manager for over 20 years, I extended my past medical experiences in the health care field to collect data from 20 rural PCPsand physician assistants at rural primary care clinics. I have no connection to the current topic, participants, or clinics. I identified any conjectures, prejudices, and personal assumptions at the beginning of the inquiry.

Participants

I gained access to the research sites through existing contacts and fieldwork. Patton (2002) stated advanced fieldwork secures entries to study sites of a reputable organization. A quick proposal was made for the gatekeepers at the rural primary care clinics to gain access to the research site. Relationship building establishes trust and credibility. It also helps the researcher gain physical access to the research area of management (Patton, 2002).

There was a purposive sample of 20 physicians and physician assistants chosen

for the study from two different primary care clinics in Missouri. Interviews were audio recorded, transcribed for analysis, and formatted into matrices to uncover common factors until data saturation. The interview questions were open ended to encourage rural PCPs and physician assistants to describe their lived experiences to gain insight on overcoming barriers to implementing EHRs. Suri (2011) acknowledged when choosing participants for qualitative interviews the researcher must establish a sampling strategy conceptually aligned with the purpose of the research, which adequately addresses the investigation design. Patton (2002) explained qualitative investigations involve choosing a purposeful sample of participants who best represents the phenomenon understudy. The rural PCPs and physician assistants were suitable for the qualitative study according to Moustakas's (1994) criteria for selecting participants for a phenomenological research. The participants must experience a phenomenon (Moustakas, 1994). The participants should have a good understanding of the phenomenon nature and significance (Moustakas, 1994), and the participants have to consent to participate in extended interviews until data saturation (Moustakas, 1994).

The rural PCPs and physician's assistants received an informed consent prior to the study via face-to-face or e-mail to request their participation in the study. The participants returned the consent to me indicating their willingness to volunteer to participate in the interviews and their willingness for me to publish the results in a doctoral study. The consent form acknowledged the participants' participation was voluntary, they could leave the study at any time, and I would maintain the confidentiality of all information.

Research Method and Design

Qualitative researchers use qualitative research to explore why something happened (Patton, 2002). The purpose of a qualitative method is to explore, observe, and understand lived experiences and perceptions of a phenomenon (Savage-Austin & Honeycutt, 2011). Moustakas (1994) noted that researchers must remove their personal point of view to gain knowledge and expertise of those under investigation in qualitative studies.

A phenomenological design helped me understand and explain how to overcome EHRs implementation barriers from the perspective of PCPs and physician assistants. Phenomenological research design helps researchers to understand and explain a phenomenon (Savage-Austin & Honeycutt, 2011). A phenomenology study also helps researchers to understand how humans experience a phenomenon (Patton, 2002). Using a phenomenological design increased my understanding on overcoming EHRs implementation barriers at rural primary clinics by exploring lived experiences and perceptions in the real world setting. A phenomenological design involves understanding patterns and relationships of lived experiences of the participants (Moustakas, 1994; Savage-Austin & Honeycutt, 2011).

Method

There are three methods of research: (a) quantitative, (b) qualitative, and (c) mixed method. Qualitative studies are subjective, and qualitative researchers interpret the meaning of participant lived experiences (Hanson et al., 2011). Themes emerge as qualitative researchers interpret the data, whereas quantitative researchers test

predetermined theories and hypotheses (Hanson et al., 2011). Creswell and Zhang (2009) pointed out qualitative method is inductive and quantitative method is deductive. A quantitative researcher determines the relationship between independent and dependent variables in a given survey population (Hanson et al., 2011) and a qualitative researcher utilizes (a) dialogue, (b) listening and (c) interviewing to create a shared understanding of a phenomenon (Branthwaite & Patterson, 2011). A quantitative method fails to provide information about the background of the circumstances in which the phenomenon occurs (Patton, 2002).

Further, mixed method research combines qualitative and quantitative methods to draw inferences from the data (Cameron, 2011). When a quantitative or qualitative method is solely insufficient, a mixed method study increases the trustworthiness of the data (Turner, 2010). In the current study, a qualitative process is sufficient for gathering rich information to understand overcoming barriers to implementing EHRs through interviewing, note taking, and audio recording; thus, it is a better fit than either quantitative or mixed method (Leech & Onwuegbuzie, 2009; Moustakas, 1994; Nuttall et al., 2011). Mixed method research is trustworthier and requires researchers to conduct two analyses. Mixed design research is a lengthy process, and time is a factor in the Walden University DBA program.

I used a qualitative method and selected 20 rural primary care physician and physician assistants according to a purposive sampling technique (Patton, 2002). The interviews were audio recorded and transcribed for analysis and the data were formatted into matrices to uncover common factors until data saturation. Liu, Lei, Mingxia, and

Haobin (2010) pointed out qualitative research is a way to understand the problem through explored lived meanings of individuals who experience the phenomenon. Chenail (2011) asserted qualitative research methodology also links assumptions with theories for an explicit understanding of the problem. Graffigna, Bosio, and Olson (2010) noted the purpose of qualitative research is to increase the knowledge of the researcher on the phenomenon under study. Using a qualitative methodology encouraged further exploration of the research questions and rural PCPs and physician assistants' lived experiences on overcoming barriers to implementing EHR at rural primary care clinics (Chenail, 2011). Additionally, qualitative research helped me to understand the phenomenon better in the context of what the rural PCPs and physician assistants said (Fiss, 2011).

Research Design

Phenomenology dates back to the 18th century (Moustakas, 1994; Smith, 2013). It is a philosophy of empiricism and analysis of positivism (Moustakas, 1994; Smith, 2013). Phenomenology existed during a time when empiricism and positivistic science failed to explain general questions, which were necessary for different conditions (Moustakas, 1994; Smith, 2013). German philosopher Husserl (1859-1938) founded the philosophy of phenomenology in the early 20th century (Moustakas, 1994; Smith, 2013).

Heidegger, Husserl's successor, extended the phenomenological philosophy works (Smith, 2013). Husserl's framework affirms there should be no separation of humans from their lifeworld experiences or awareness of meanings in their lives (Dodd, Anderson, & Jack, 2013). Heidegger urbanized interpretive phenomenology, and Husserl

coined descriptive phenomenology (Dodd et al., 2013).

Early contributors to phenomenological philosophy also included Jasper, Scheler, Sartre, and Marcel (Sanders, 1982). Other phenomenological philosophy founders were German philosopher Franz Brentano and French phenomenologist Merleau-Ponty (Dodd et al., 2013). All of these philosophers were responsible for moving the phenomenological views forward as an interpretive tool for understanding lived experiences in the context, perceptions, and understandings (Stanghellini, 2011).

I used a phenomenology design to interview 20 rural PCPs and physician assistants for a deeper understanding of overcoming barriers to implementing EHRs at primary care clinics. Data saturation occurred through comprehensive interviews. The interview questions were open ended to encourage rural PCPs and physician assistants to describe their lived experiences to gain insight into the phenomenon. Phenomenology is interpretive and descriptive (Pringle, Drummond, McLafferty, & Hendry, 2011). Converse (2012) said phenomenology searches for a phenomenon, which other methods cannot tell. Cypress (2011) said phenomenology is an analytical framework for exploring lived experiences and their understanding of the world. Phenomenology research allows researchers to understand the phenomena from the participants' perspectives, based on their personal knowledge of the experience (Phillips-Pula, Strunk, & Pickler, 2011).

Qualitative designs are a case study, ethnographic and grounded theory study. A case study is a qualitative design that researchers use to determine how something happens with a smaller number of participants (Yin, 2013). The study was not a single experience because it explored overcoming barriers to implementing EHRs at different

times. A case study design did not meet the objectives of the study because there were more than one business understudy. An ethnographic study is a qualitative design where researchers study ethnic groups along time through interviewing and observations (Kriyantono, 2012). The purpose of the study was to explore lived experiences of PCPs and physician assistants and not cultural groups, so an ethnographic study was not relevant. A researcher uses a grounded theory design to collect data and create many theories over a long time (Patton, 2002). Time is a factor in Walden University's DBA program, so a grounded theory was not suitable for the current study. For this reason, a phenomenological approach was better for exploring overcoming barriers to implementing EHRs at rural primary care clinics, an area that requires in-depth knowledge and perceptiveness of 20 rural PCPs and physician assistants. A phenomenological approach provided rural primary care physician's time to reflect on their personal lived experiences on overcoming barriers to implementing EHRs, and how they see the world related to those experiences (Portides, 2011). Cypress (2011) stated phenomenology is how individuals experience life in general and how their life becomes collectively significant. Phenomenology examines the participants' experiences of a problem in a first-person point of view (Del Casino, 2011). Researchers use phenomenological designs to understand why a phenomenon occurs (Patton, 2002).

Population and Sampling

There was a purposive sample of 20 physicians and physician assistants chosen for the study from two different primary care clinics in Missouri. The interview questions were open ended to encourage rural PCPs and physician assistants to describe their lived

experiences. A purposive method was best to explore the lived experiences and perceptions of rural PCPs physician assistants on overcoming barriers to implementing EHRs. The purposeful sample of physicians and physician assistants had to experience the phenomenon in their natural rural primary care clinic setting. The criterion for selecting participants demonstrates the knowledge and understanding of the researcher and his or her ability to reflect on the problem under investigation (Moustakas, 1994). A purposive sample is representative for selecting participants and sites to promote information rich studies (Phillips-Pula et al., 2011). Patton (2002) said a purposive sampling method selects individuals and site locations according to a central aspect. The purposive method for the study and the selection criteria was consistent with qualitative methodology (Patton, 2002; Suri, 2011). The study's sample size flowed from the purpose of what I wanted to know, what was credible, and what I wanted to find in the least amount of time with limited resources. Sampling continued through interviews until the information was redundant (Patton, 2002).

Qualitative research allowed me to collect detailed information from smaller sample sizes, and sample sizes were large enough to be justifiable to achieve data saturation (Patton, 2002). Qualitative sample sizes could range from five to twenty-five in a qualitative study (Hays & Wood 2011). Suri (2011) affirmed a sample should be enough for saturation and not a criterion for the number of interviews. Hanson, Balmer, and Giardino (2011) acknowledged a range of five to twenty-five subjects that have personally experienced the phenomenon are appropriate for qualitative phenomenology research. Groenewald (2004) indicated two to ten participants are sufficient to achieve

saturation for a phenomenology study. Walden University recommended a minimum sample size of 20 participants for qualitative, phenomenological research and this recommendation was the method used for the sample size in the study (Walden University Center for Research Quality, 2012). Twenty rural PCPs and physician assistants at rural primary care clinics were an adequate sample size (Hanson et al., 2011, Phillips-Pula et al., 2011). The goal of a smaller sample size was to better understand how to overcoming barriers to implementing EHR at rural primary care clinics, and not to generalize to a larger population (Patton, 2002; Suri, 2011).

The participants' identity remained confidential. I considered who met the following eligibility criteria as potential participants from a purposive sample of 20 rural PCPs and physician assistants. If more than 20 rural PCPs and physician assistants met the criteria of eligibility, they were included because of their lived experiences related to overcoming barriers to implementing EHRs at their rural primary care clinics. Each rural PCP and physician assistant participant had have adopted a simple EHR and used the system for at least 6 months. Each rural PCP and physician assistant was motivated to participate in lengthy interviews, which I recorded and transcribed. Each rural PCP and physician assistant had an interest in the issue and personal experience with the adoption, implementation, and use of an EHR system. Each potential rural PCP and physician assistant agreed to publish the information. The rural PCPs and physician assistants had a false name and number for confidentiality reasons, and they understood the confidentially of the final published data results. I discuss these factors more fully in the following Ethical Research section.

Ethical Research

The rural PCPs and physician assistants received an e-mail or letter introducing the study. The study invitation asked for volunteers and included an informed consent forms (see Appendix B for a copy of the informed consent form). An informed consent form is a written contract stating the researcher took precautions to mitigate any risks during the study that can cause harm to participants (Moustakas, 1994). The informed consent letter stated the participants could leave the study at any time after selection with no consequences. Walden University's approval number for this research study was 11-13-14-0031400. There were no incentives for participating. The participants were free chose to participate because of their interest in the topic and not because of incentives (Golafshani, 2003). All rural PCPs and physician assistants returned a signed copy of the permission letter either electronically or via mail to the researcher (Moustakas, 1994). Ethical research requires qualitative researchers to show they are reliable, trustworthy, and credible (Patton, 2002).

After I received the consent, I returned a copy to the rural PCPs and physician assistants. The signed inform consent and documents pertaining to the study will remain locked in a safe for 5 years (Walden University Center for Research Quality, 2014). I explained the inclusion criteria for the returned consent forms and followed up with the rural PCPs and physician assistants by phone or emails to schedule an interview appointment. The informed consent letter included permission to audio record the rural PCPs and physician assistants' conversations and note taking during the interviews. The study results include quotes from the rural PCPs and physician assistants. The rural PCPs

and physician assistants' identity will remain confidential, and each rural PCP and physician assistants had a false name and a number from 1 to 20 for privacy, such as Participant 1, Participant 2, and Participant 3. A system for masking their information ensured confidentiality of the rural PCPs and physician assistants. I asked the rural PCPs and physician assistants to be honest and upfront about their understandings and thoughts to strengthen the study. After the interviews, all the participants received a thank you letter by mail or email.

Data Collection

Data collection included many interrelated activities, which went beyond the collection of information (Patton, 2002). Data collection is different, depending on the approach to research (Patton, 2002). The researcher is the instrument for collecting the data, in qualitative research (Patton, 2002). The data collection of the current qualitative, phenomenological creates a framework for collecting and recording information, and sets boundaries for data analysis (Patton, 2002).

Instruments

I used audio recorded interviews and open ended questions (Appendix A) to elicit answers and collect data on overcoming barriers to implementing EHRs from PCPs and physician assistants. The purpose of interviewing was to collect data (Patton, 2002). Patton (2002) affirmed the interview process creates a framework for effective qualitative data. Each subject will respond to the same open ended interview questions. Open ended interview questions are also more suitable for in-depth interviewing because the open ended questions allow participants to reveal their lived experiences in more detail

(Hanson, Balmer, & Giardino, 2011). Open ended questions also collect more information rich data (Patton, 2002). The open ended interview questions encouraged rural PCPs and physician assistants to describe their lived experiences (Schultze & Avital, 2011). The unstructured nature of phenomenological research allows the participants to do most of the talking (Hanson et al., 2011).

The interviews were audio recorded, and transcribed for analysis, and formatted into matrices to uncover common factors. Moustakas (1994) stated (a) explaining data collection procedures helps others to repeat the study, (b) descriptive writing addresses research reliability issues, and (c) exemplary record keeping and documentation aids research replications. Additionally, QSR's Internationals NVivo 10 software program for qualitative research was a repository for the data collected.

Data Collection Technique

I was the chief collection instrument (Patton, 2002). The data collection was through audio recorded interviews, and open ended questions. There were transcription of the audio recorded interviews for analysis and formatting of the data into matrices that uncovered common factors from rural PCPs and physician assistants on overcoming barriers to implementing EHRs at rural primary care clinics. Face-to-face, audio recorded interviews and open ended questions, and written records allowed me to gather lived experiences from rural PCPs and physician assistants on overcoming barriers to implementing EHRs. The data collected related to the phenomenon understudy was through verbal communication because of the method (i.e., qualitative, phenomenological). Consistency is the key to collecting reliable and valid information

(Patton, 2002).

After each interview, I listened to the recorded interviews and typed a detailed account as soon as possible. A typed, detailed account of the interviews occurs as soon as possible to ensure the accuracy of the data (Mapp, 2008). Transcript review ensured the validity of data and accuracy of data (Creswell & Zhang, 2009). Transcript review occurred by emailing interview transcriptions to each participant for review and corrections. Each detailed account of the interview was verbatim. The open ended interview questions were as follows:

1. What are your experiences related to barriers to implementing electronic health records systems?
2. How are internal mechanisms, such as shared health networks, internal technology, and technology diffusion mechanisms, such as staff technology skills and knowledge and the staff's ability to learn and adapt, related to these barriers?
3. How can health care administrators at rural primary care clinics work together with multiple agents to reduce barriers and increase electronic health records adoption rates?
4. How do environmental factors, such as consumer health marketplaces, and the demand for access to patients' health records relate to electronic health records systems implementation barriers?
5. How do other environmental factors, such as the patient's demand and payer source demand for the EHR bill processing, relate to these barriers?

6. How do rural primary care physicians and physician assistants define the health care organizations cultural systems and behaviors related to electronic health records implementation barriers?
7. What are the perceived external environmental barriers to implementing electronic health records at rural primary care clinics, such as government regulations, technology development, and health care demand?
8. How can primary care physicians and physician's assistants work together with other agents to overcome barriers to implementing electronic health records systems at rural primary care clinics?
9. What else you would like to add that I did not address in these questions?

NVivo 10 facilitated and captured information (e.g., what participants thought about particular of the phenomenon). In addition, using NVivo 10 aided in identifying any trends in other interview responses. QSR's Internationals NVivo 10 software program for qualitative studies is a repository for the data collected. QSR International NVivo 10 software program eliminates manual tasks such as code formation, sorting, and data arranging (Patton, 2002). The computer program quickly linked interview documents together to trace themes through different interview questions (Walsh, White, & Young, 2008). The same information may belong to different categories.

Open ended interview questions served as a script for collecting data (Appendix A). There were audio recording during the interviews. Audio recordings ensured accurate and detailed verbiage captured the rural PCPs and physician assistants' responses to the open ended questions. I rejected rural PCPs and physician assistants who refused audio

recording during interviews. After the interviews, verbatim transcription of the notes and audio recordings of each rural PCPs and physician assistant's interview occurred to remove any verbiage that would breach confidentiality. There was also the removal of irrelevant conversation not related to the analysis during coding. When I finished the interview sessions, the rural PCPs and physician assistants were thanked for their contribution. Additionally, I gave them an opportunity to receive a copy of the completed study after the conferral of the degree through email.

Data Organization Techniques

I typed each interview into a Word document and entered it into NVivo 10 to organize the raw, unstructured, interview data. NVivo 10 was a powerful software query tool. Patton (2002) acknowledged since the mid-1990s NVivo has been a standard software package for qualitative research. The software program quickly connects interviews together to trace themes through different interview questions (Walsh et al., 2008). NVivo 10 codes and organizes the collected information into different categories because the same information may belong to several different categories (Patton, 2002). The NVivo 10 software program organized interview details to determine if there were particular trends in the other interview responses (Walsh et al., 2008).

The organization of the data was by rural primary care clinics and rural PCPs and physician assistants. The coded identities of the rural PCPs and physician assistants ensured privacy at all stages of the research process. The code for each rural PCP and physician assistant consisted of a false name and a number from 1 to 20 for privacy (i.e., Participant 1, Participant 2, and Participant 3). It was an organization method for masking

the participant's identity and ensured confidentiality. A password protected computer stored the data at all times for fast access and protected confidential information. A flash drive also stored all the research information in case something happened to the computer. A locked cabinet secured the flash drive along with interviews, notes, and consent forms. I will keep the documents for five years after the termination of the research (Walden University Center for Research Quality, 2014).

Data Analysis Technique

NVivo 10 cataloged and grouped the preliminary data. Next, NVivo 10 reduced and eradicated the data. Then, data were grouped to generate themes of the unchanging components. After that, the data was checked for validation and unchanging constituents and themes identified by appliance. Finally, textural and structural details and description of the phenomenon was built out of the rural PCPs and physician assistants' meanings to understand overcoming barriers to implementing EHRs at rural primary care clinics (Moustakas, 1994). A van Kaam method of study involves understanding the phenomenon, meaning, and context of the rural PCPs and physician assistants lived experiences on overcoming barriers to implementing EHRs at rural primary care clinics. The van Kaam methodology helped to identify patterns and trends by identifying shared beliefs (Moustakas, 1994). Patton (2002) defined van Kaam philosophy as a psychology technique that wants to reveal and explain the aspect of behavior. Moustakas (1994) said phenomenology studies are life experiences reported in first-person and a modified van Kaam method analyzes captured data through qualitative research. Gerard (2012) recognized a phenomenology analysis using the modified van Kaam method, generates

information that quantitative research cannot capture.

Reliability and Validity

In a qualitative phenomenological study, it is vital to establish reliability and validity. Validity is nonexistent without reliability (Patton, 2002). Reliability and validity are a quality measure necessary for consistency and repeatability (Trochim & Donnelly, 2007). Reliable and valid results come from accurate interpretation of the data (Tracy, 2010).

Reliability

Qualitative researchers use particular methods to verify the accuracy of the findings and increase the reliability of the study (Ali & Yusof, 2011). To determine the reliability of this qualitative phenomenological study I reported all measures and procedures. Additionally, I preserved all documents to confirm what I describe was credible, transferable, dependable, and confirmable, and there were no mistakes (Patton, 2002). Reliability procedures include asking the participants the same questions, checking for transcription errors, checking for changes in codes, and cross checking (Ali & Yusof, 2011). Internal reliability of the study was realized by me solely collecting the data and asking each participant the same open ended interview questions. A researcher achieves internal reliability when the measurement instrument is the same (Ali & Yusof, 2011). The research questions were not bias or misleading because the interview questions were consistent throughout the study. I documented all steps and procedures, and the method and design throughout the study to establish reliability (Patton, 2002). Moustakas (1994) stated systematically compiling of qualitative data could achieve

reliability.

The following approaches was used to increase the reliability of the lived experiences of rural PCPs and physician assistants on overcoming barriers to implementing EHR at rural primary care clinics. Each rural PCP and physician assistant received an informed consent form by email or face-to-face (Appendix B) meetings depended upon the availability of the rural PCP and physician assistant. I addressed all the concerns or questions the rural PCPs and physician assistants had in regards to the informed consent form before the data collection began. Before audio recording, each rural PCP and physician assistants gave a verbal agreement to record the interview. I asked each rural PCP and physician assistant if he or she had any concerns relating to questions or the study before the interview process. If the rural PCP and physician assistant had any concerns, I resolved them, or they discontinued participation in the study. There were instructions provided to each rural PCP and physician assistant to give open and honest answers. I told the rural PCP and physician assistant their responses would stay confidential and thanked them for participating. The coded identities of the rural PCPs and physician assistants ensured confidentiality by using a false name and a number from 1 to 20 for privacy, such as Participant 1, Participant 2, and Participant 3. It was a system for masking their information and ensured confidentiality of the rural PCPs and physician assistants. There was a transcription of each audio recorded interview verbatim and the deletion of any verbiage that jeopardized the confidentiality of the data. In addition, any information not related to the study was removed. Ali and Yusof (2011) pointed out reliability ties directly to the ethical manner in which I conduct research.

Additionally, a literature review was conducted to increase the reliability of the study. Wikman (2006) pointed out theories derived from literature reviews or other experts are reliable and valid. Wikman (2006) also affirmed literature reviews influence the research topic and research. Utilizing a literature review for the creation of themes is essential to measuring of reliability and validity of the study. Establishing ideas through other people's research is necessary to ensure I investigate a proven problem within the business field. Patton (2002) said enhanced reliability in research comes from professionals impacted by the research and from experts in the same area of research.

Validity

Validity is the cornerstone of qualitative research because it describes the methods, which led to the results (Siccama & Penna, 2008). Patton (2002) stated a qualitative researcher's main concern is the accurateness of the study and that the facts remain undistorted or made up. I asked the same open ended, research questions in the same order to maintain consistency in the study. The qualitative research was quantified by coding the themes of the participants' responses. Researchers should maintain the accuracy of their findings by employing certain methods to produce accurate findings (Jonsen & Jehn, 2009). Validity signifies how well scientific research measures what it sets out to govern and how well it represents qualitative research (Grossman, Zayas-Cabán, & Kemper, 2009). Research is more likely to be valid when it produces quality and trustworthy results (Riege, 2003).

Trochim and Donnelly (2007) outlined strategies for checking the validity of the data: triangulation, member checking, rich, thick descriptions, clarifying researcher bias,

presenting discrepant or negative information, peer debriefing, and external reviewer. Transcript review and rich, thick descriptions were used to ensure the validity in the study. For transcript review, the participants reviewed and confirmed that I had transcribed the interview with their exact words and descriptions. Ali and Yusof (2011) noted that clarifying what the study participants say establishes validity. Transcription review helped to ensure the accuracy of the data collected (Patton, 2002).

Rich, thick descriptions were used to describe the rural PCPs and physician assistants lived experiences and the place of the phenomenon to put the readers in the context. Tracy (2010) said results are only useful if the findings mean something to other people. Trochim and Donnelly (2007) suggested using rich, thick description when validating research. Qualitative interviews and carefully selected, small sample of rural PCPs and physician assistants will yield rich, thick descriptions (Patton, 2002). Tracy (2010) indicated this method of authentication assures accuracy and establishes credibility. Accurate data interpretation leads to valid results (Tracy, 2010).

It is not important to address internal and external validity in the study because these are quantitative terms, and this is a qualitative study (Trochim & Donnelly, 2007). Peck, Kim, and Lucio, (2012) and Trochim and Donnelly (2007) acknowledged four criteria to evaluate qualitative research including (a) credibility, (b) transferability, (c) dependability, and (d) confirmability. These measures are better for validating qualitative research because of the assumptions in the method of research (Peck, Kim, and Lucio, 2012). These characteristics also build trust into the research process, allowing for favorable results for a valid study (Golafshani, 2003). Strategies in a research study

confirm the study's trustworthiness (Patton, 2002).

Transition and Summary

The aim of the qualitative phenomenological study was to collect data from rural PCPs and physician assistants on overcoming barriers to implementing EHR at rural primary care clinics. Reliability and validity are necessary for the creditability of qualitative research (Patton, 2002). Establishing the reliability and validity of the information collected was a priority of a qualitative researcher. The documents will be kept to show informed consent and stored on a password protected computer for five years after the research.

In the last section, I give an overview of the study, detail findings applicable to the business world, and recommend future actions for overcoming the barriers to implementing EHRs.

Section 3: Application to Professional Practice and Implications for Change

The purpose of this qualitative phenomenology study was to explore rural PCPs and physician assistants' experiences regarding overcoming barriers to implementing EHRs. The participants in this study included 21 rural PCPs and physician assistants who adopted a simple electronic health records system for at least 6 months at their rural primary care clinic. The primary data collection methods for the study involved face-to-face interviews with participants and documentation from the literature review such as peer reviewed studies and health care articles. In Section 3, I present the findings of the study, discuss the application of the study to professional practice, discuss the implications of social change and action, further research, reflections, and the conclusion of the study.

Overview of Study

The purpose of this qualitative phenomenology study was to explore rural PCPs and physician assistants' experiences regarding overcoming barriers to implementing electronic health records. The central research question for this study was the following: What are the rural PCPsand physician assistants' lived experiences and perceptions of CAS as they pertain to overcoming barriers to implementing electronic health records? The primary data collection methods for the study involved face-to-face participant interviews and documentation from the literature review such as peer reviewed studies and health care articles. A purposeful sampling approach resulted in 21 participants who were rural PCP and physician assistants at rural primary care clinics. I audio recorded, transcribed, and analyzed the interviews in NVivo 10 and compared the literature review

with emergent themes from the study to determine how rural PCP and physician assistants might overcome barriers to implementing electronic health records. The study's participants were rural PCP and physician assistants' who adopted a simple electronic health record system for at least six months at their primary care clinic. Exploring how overcoming barriers to implementing electronic health records may provide insight into decreasing costs and improving electronic health information exchange, while reducing EHR barriers through education and innovative organizational models that are distinct to rural health care populations. The participant perceptions gathered from this research included unfavorable opinions of ARRA, HITECH, and PPACA legislation and the viability of the rural primary care clinics under the ARRA, HITECH, and PPACA legislation. In addition, I identified four emergent themes from the participants interviews: (a) lack of finances to support EHRs, (b) health information exchange issues, (c) lack of business education, and (d) lack of transformation at rural medical practices.

Presentation of the Findings

I used the CAS theory to construct themes as a means to conceptualize thoughts and ideas from rural PCP and physicians' assistants regarding how rural primary care clinics can overcome barriers to implementing electronic health records. The terms demonstrate the emergent themes most prevalent among the data from the participants. I arranged the presentation of findings section by these four themes: (a) lack of finances to support EHRs, (b) health information exchange issues, (c) lack of business education, and (d) lack of transformation at rural medical practices. As noted in Figure 1, finances, health information exchange, education, and change management were the most recurrent

terms identified. Figure 1 depicts a word cloud generated from face-to-face interviews.

Figure 1. Word cloud generated from face-to-face interviews regarding the participant perceptions of overcoming barriers to implementing EHRs. The terms demonstrate the emergent themes most prevalent among the data from the participants.

Exploring the frequent words in the cloud aided the development of four emergent themes that were common amongst the participants. The following frequent words were identified by examining the nodes in NVivo 10: (a) finances, (b) health information exchange, (c) education, and (d) change management. These words were linked to participant statements regarding overcoming barriers to implementing EHRs. The frequent words from the face-to-face interviews of the participants' perceptions were the basis for four emergent themes: (a) lack of finances to support EHRs, (b) health information exchange issues, (c) lack of business education, and (d) lack of change management at rural medical practices.

Theme 1: Lack of Finances to Support EHRs

A number of physicians perceive EHRs as hard to use and expensive (Ajami, Ketabi, Isfhani, & Heidari, 2011; Loomis, Ries, Saywell, & Thakker, 2002). EHR adoption costs make it more challenging for smaller health care providers (Adler-Milstein & Bates, 2010). The high costs of EHR systems implementation and ongoing development and maintenance pose a higher risk for smaller providers (Lluch, 2011). All participants responded that the financial burdens of acquiring and implementing EHR systems, the systems ongoing development and maintenance, and the uncertainty of medical practices return on investment creates barriers. The participant's perceptions concur with studies by Adler-Milstein and Bates (2010), Ajami et al. (2011), Loomis et al. (2002), and Lluch (2011). The participants agreed it was difficult to deliver medical care that is less expensive while increasing quality of care in highly complex rural primary care businesses. Their statements included the following:

- "EHRs costs create problems for smaller practices with less operating capital."
- "Rural practices may not see the financial benefits of EHRs for a long time. This creates operating issues for the smaller rural practices."
- "Smaller rural medical practices cannot afford to buy EHR systems, and pay for ongoing costs and maintenance when they have to reduce patient flow to accommodate the learning curve of implementing new technology."
- "The government needs to regulate EHR system costs because there are

already monopolies."

Theme 2: Problems with Health Information Exchange

The exchange of electronic health information plays a large role in health care businesses (Adler-Milstein & Bates, 2010). HIEs exchange electronic health information between organizations according to a set of values (eHealth Initiative, 2012). The information is in the form of electronic health data pertaining to a patient's health care and status (Deas & Solomon, 2012). Repeatedly electronically communicated data is incomplete (Ross et al., 2010). Electronic health records enable health information to go through several providers and software programs (Ajami et al., 2011). For this reason, there is a need to support and develop EHR systems on a nationwide level (eHealth Initiative, 2012). All participants responded that the support and development of EHR systems need to be universal because their EHR does not interface well with other EHRs, and electronic health data is frequently incomplete. The participants concurred with findings by Adler-Milstein and Bates, (2010), Ajami et al., (2011); Deas and Solomon, (2012), eHealth Initiative (2012), and Ross et al. (2010). The participants agreed it was hard to get all of the electronic health data they need quickly, and it decreases the quality of care. Their statements included the following:

- "Rural communication companies were not prepared for EHR systems. Our Internet could not support our EHR system at first. It causes a lot of down time and stress for our employees."
- "It would be better if everyone had one unified EHR system. Our system does not interface well with other EHR systems. It creates frustration and

extended wait times when trying to get a patient's health information."

- "We need one universal EHR system, so the patient's health information is readily available. It would increase patient flow and quality of care."
- "We need better Internet connections for our EHR systems. The government should have mandated communication companies to be ready for EHR systems. The Internet in our rural area could not support our EHR system when we went live. When the Internet goes down, it creates stress in the workplace because of lost data and computer downtime."

Theme 3: Lack of Business Education

All the participants acknowledged they did not get any formal business training in medical school, which concurs with the findings of Greysen, Wassermann, Payne, and Mullan (2009) and Weingarten, Schindler, Siegel, and Landau (2013) who noted that a majority of medical professionals do not acquire formal business training while attending medical school. Additionally, Iezzoni and El-Badri (2011) asserted business education is essential to ARRA, HITECH, and PPACA requirements of measuring quality and accountability in health care organizations. All participants indicated business training at medical schools would be beneficial to understanding how to decrease costs in health care and improve the quality of health care. Their statements included

- "The transition from paper to EHRs would be much easier with formal education, ongoing and hands on training."
- "Rural primary care practices need to offer more training and hands on before they go live with EHR systems. I feel like we did not have enough

training or hands on when we went live with our EHR. It would have been much easier and less stressful if we had had a week of mock practice."

- "The computer programs need to be more users friendly, and we need more education and hands on training before using EHR systems."
- "Education will be the key to EHR dissemination and acceptance."

Theme 4: Lack of Change Management in Rural Medical Businesses

Health care organizations implement new technology solutions to streamline business activities, increase efficiency, achieve organizational objectives, and maintain their future (Kumar & Bauer, 2011). New technology opens many possibilities to solve future problems and alleviates spending pressures (Astolfi, Lorenzoni, & Oderkirk, 2012). However, Smith (2011) indicated leadership is the missing element in many IT implementation development efforts. Successful organizational change and innovation require strong leadership to develop new concepts of what works and ensure employees will take on new responsibilities (Sarker & Lee, 2003). All participants indicated health care businesses continue to struggle with HIT implementation and development. Additionally, HIT implementation and development requires everyone to be on board, and lack of support from management and employees increase the chances of HIT failure. Sarker and Lee (2003) and Smith (2011) posited a majority of businesses continue to struggle with inefficiencies as they move through the HIT implementation and development transformation process. All participants agreed successful change management involves the systematic transformation of technology, processes, and people. Their statements included:

- "The change process needs good management to support the buy in."
- "EHRs have to be supported from the top down to be successful."
- "Managers have to take ownership of change to get ownership from everyone. It has to start at the top to trickle down."
- "People do not like change, so they resist it."

Applications to Professional Practice

According to the responses received in this qualitative phenomenological study, the results may provide rural PCPsand general business leaders with information helpful for improving change management strategies and promoting change effectiveness in different organizations. These outcomes are also important for business leaders when considering a new change initiative. Ensuring business leaders have the necessary tools for an organizational change effort might reduce change resistance plans implemented by PCPs and general business leaders. Additionally, PCPs and general business leaders can apply the information to create innovative solutions for organizational problems, improve responsiveness to customer needs, and lower costs. Primary and rural care physicians and general business leaders might use the information to promote the adoption of EHRs, provide cost efficient business services, and improve change management plans.

Implications for Social Change

The implications for positive social change include the potential to provide rural PCPsand general business leaders with information to create innovative solutions for organizational problems, improve responsiveness to customer needs, and lower costs. The application of all of these practices aforementioned may contribute to improved

organizational performance. Social change drives the need for innovations and efficient systems (Adler-Milstein & Bates, 2010). Improved organizational performance could create a benefit for the primary care practices, the employees, and the consumers served by rural communities.

I was able to provide rural PCPsand general business leaders with information that might help develop innovative organizational models that are cost effective, and exclusive to rural health care populations. Developing a better understanding of innovate models may benefit society through the creation of innovative solutions to organizational problems, improved sensitivity to customer needs, and lower costs. Health care and general business leaders have information that may be useful in improving change management plans, empowering employees, promoting effective change in various organizations, and encourage social change for all of the stakeholders.

Recommendations for Action

Opportunities exist for rural primary health care clinics to examine how the design and implementation of the EHRs components may address the uncertainty and unanswered questions from rural PCP and physician assistants lived experiences. Dissemination of information and communication with gatekeepers would relieve confusion and be beneficial in gathering information from the physician and physician assistants' population on overcoming barriers to EHRs implementation. The CASs in the literature review was applicable in a rural setting because of the complex nature, the financial constraints, and the lack of knowledge and the diversity of medical practices. There are several recommendations for plans of action that emerged from the study. The

suggestions from the interviews included the following:

1. EHR systems need to be more universal.
2. EHR systems must be feasible financially for rural primary care clinics.
3. The development of health care delivery models should support individual health care populations rather than standardize populations.
4. Medical reimbursement should be geared towards an individual billing system and quality elements and not based solely on positive and negative outcomes of patient care.
5. Communication companies in rural areas should be mandated to provide better Internet services to rural health care clinics.
6. Basic business courses in medical school would help health care providers implement cost effective strategies for patient care that helps reduce wasteful health care spending.
7. Newsletters and blogs would help rural health care clinics learn how to overcome EHRs barriers by sharing what worked for other rural health care clinics, and what did not.

Recommendations for Further Study

Health care organizations continuously evolve and change rapidly underneath the ARRA, HITECH, and PPACA legislation. I found several themes throughout this study that warrants further research. Replication of the study in different regions of the United States would be valuable in determining similarities or differences in rural PCPs and physician assistants' perceptions in comparison to those found in Southeast region of

Missouri. Additionally, replication of the study in different health care specialty practices would be valuable in determining similarities or differences in rural PCPs and physician assistants' perceptions in comparison to those found in rural primary care practices. Other areas to consider further may be exploring and examining changes in health care providers' attitudes toward implementing and using EHRs five years after EHR implementation.

Reflections

The health care industry is very complex with many diverse stakeholders, so it was not easy to examine one facet of health care component without acknowledging the mutually dependent components of the whole health care system. Ever since the implementation of the ARRA, and HITECH legislation in 2009, and the PPACA legislation in 2010, I was intrigued but had limited knowledge of how these legislations might affect the business models of independent rural primary health care practices. The participants helped me to understand EHR implementation barriers under the ARRA, HITECH, and PPACA legislation. Additionally, the participants allowed me to disseminate and publish information to rural PCPsand physician assistants in rural primary care clinics. I am able to provide rural PCPsand general business leaders with information to help develop innovative organizational models that are cost effective, and exclusive to rural health care populations. The rural PCPs and physician assistants freely participated in the study, and without their support; the study would not have been successful.

Summary and Study Conclusions

The goal of PPACA law was to expand insurance coverage, transform organizational structures, control health care costs, provide quality of care and prevent health care fraud through technology innovation (Gable, 2011). The ARRA goal was to motivate the health care industry to increase EHR systems adoptions through incentive programs (Jain, Seidman, & Blumenthal, 2011). HITECH is a member of the AARA and involves an extensive commitment to implementing HIT. The participant perceptions gathered from this research included unfavorable opinions of ARRA, HITECH, and PPACA legislation, technology innovation, and the viability of the rural primary care clinics under the ARRA, HITECH, and PPACA legislation. In addition, I identified four emergent themes from the participants face-to-face interviews: (a) lack of finances to support EHRs (b) health information exchange issues, (c) lack of business education, and (d) lack of change management in rural medical practices. I used NVivo 10, a computer software program, to analyze data. These emergent themes may help the health care industry and health care leaders to understand that deficiencies exist under the ARRA, HITECH, and PPACA legislation, and many questions and problems continue to be unaddressed. The rural PCPs and physician assistants are the responsible providers in regards to the health of their patients, and they believe the ARRA, HITECH, and PPACA legislation threaten their autonomy as a health care decision makers and providers. The increased regulatory climate of government in health care and the lack of diffusion of information have increased the rural PCPs and physician assistants' frustration and uncertainty. While rural PCPs and physician assistants understand that traditional

business model no longer work and there is a need to change, but many of them feel that the solo primary health care practices may not be a feasible health care model in the future because of the financial limitation. Rural PCPs and physician assistants also voiced concerns regarding business education in medical school to improve the health care providers understanding in implementing cost effective strategies for patient care that helps reduce wasteful health care spending. Under the current ARRA, HITECH, and PPACA legislation, the new paradigm shifts the focus to health care population who require innovative health care delivery models that are quality focused, patient centered, and cost effective.

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Appendix A: Interview Questions

1. What are your experiences related to barriers to implementing electronic health records systems?
2. How are internal mechanisms, such as shared health networks, internal technology, and technology diffusion mechanisms, such as staff technology skills and knowledge and the staff's ability to learn and adapt, related to these barriers?
3. How can health care administrators at rural primary care clinics work together with multiple agents to reduce barriers and increase electronic health records adoption rates?
4. How do environmental factors, such as consumer health marketplaces, and the demand for access to patients' health records relate to electronic health records systems implementation barriers?
5. How do other environmental factors, such as the patient's demand and payer source demand for the EHR bill processing, relate to these barriers?
6. How do rural primary care physicians and physician assistants define the health care organizations cultural systems and behaviors related to electronic health records implementation barriers?
7. What are the perceived external environmental barriers to implementing electronic health records at rural primary care clinics, such as government regulations, technology development, and health care demand?
8. How can primary care physicians and physician's assistants work together

with other agents to overcome barriers to implementing electronic health records systems at rural primary care clinics?

9. What else you would like to add that I did not address in these questions?

Appendix B: Consent Form

Consent Form

Invitation to Participate in DBA Research Study Entitled: Diffusion of Electronic Health Records in Rural Primary Care Clinics

I, Patricia Lynn Mason, a Doctoral Candidate working on a DBA, Doctor of Business Administration at Walden University, am conducting this study. If you are a health care professional who has *adopted a simple electronic health records for at least six months* in Missouri, I would like to request your participation.

Purpose of Research Study

I am conducting a study entitled Diffusion of Electronic Health Records in Rural Primary Care Clinics. The purpose of this study is to explore rural primary care physicians and physician assistants' experiences regarding overcoming barriers to implementing electronic health records.

Procedures

If you agree to participate in this research study, the interviews will be audio recorded and should take approximately 60 minutes to complete. In addition, I will email you the interview transcripts for your review and correction.

Voluntary Participation

Your participation in this research study is voluntary and will involve completing an interview. This means that everyone will respect your decision of whether or not you want to participate in the research study. If you decide to join the study now, you can still change your mind at any time. If you feel stressed during the study, you may stop at any

time and may skip any questions that you feel are too personal.

Risks, Benefits and Compensation of Volunteering to participate in the Study

There is no foreseeable risk to you by participating in this research. All documentation will be stored for five years, and then destroyed at the end of the storage period. The research study might provide insights that can influence social change by sharing best practices for establishing the potential to provide cost efficient health care services for a more sustainable future. The researcher will not provide a monetary contribution to the participant.

Confidentiality Agreement

I will be conducting the study and will not disclose any confidential and proprietary information pertaining to the study. The confidential information pertaining to the participants will not be disclosed to any third party except as approved in writing by the research participants.

Contact Information and Questions

If you have any questions about the research study, you may contact me, Patricia Lynn Mason by email: patricia.mason@waldenu.edu. If you have any other questions regarding the research, you may contact a Walden representative at 612-312-1210. In addition, if you have any questions about your rights as a participant, you may contact Walden University Institutional Review Board for Ethical Standards in Research (irb@waldenu.edu).Walden's University approval number for this research study is 11-13-14-0031400 with an expiration date of November 12, 2015.

Statement of Consent

I have read the Informed Consent form, and I have an understanding of the research study to make a comprehensive decision regarding my participation. If you agree to the terms and you would like to participate in the study. The signature on this form also indicates you are 18 years old or older and that you give your free participation agreement in the study described. You will also receive a copy of this consent form.

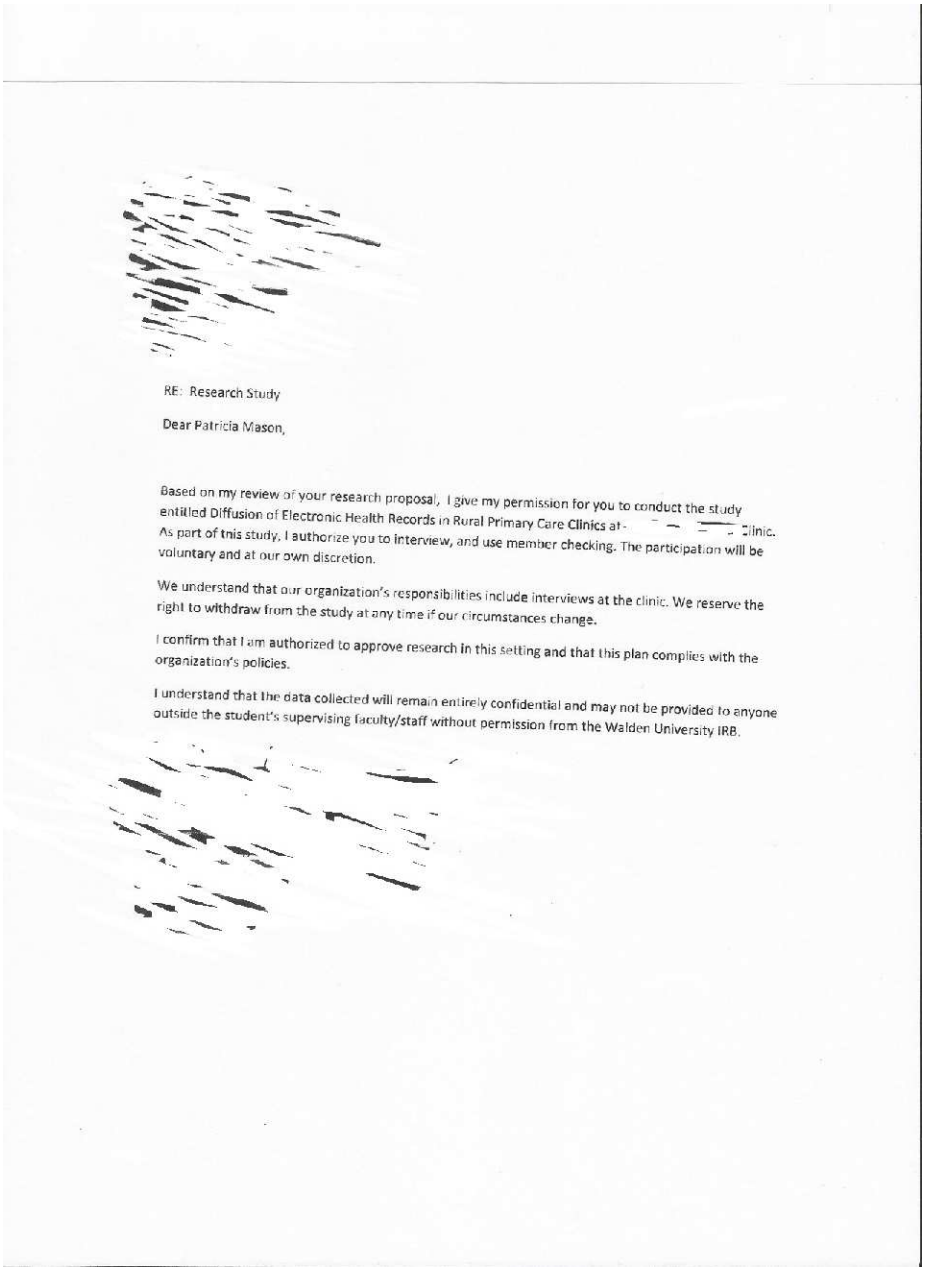
Name of Participant (please print):_____

Participant's Written Signature:

_____

Date: _____

Appendix C: Organizational Permission Forms



RE: Research Study

Dear Patricia Mason,

Based on my review of your research proposal, I give my permission for you to conduct the study entitled Diffusion of Electronic Health Records in Rural Primary Care Clinics at - [redacted] Clinic. As part of this study, I authorize you to interview, and use member checking. The participation will be voluntary and at our own discretion.

We understand that our organization's responsibilities include interviews at the clinic. We reserve the right to withdraw from the study at any time if our circumstances change.

I confirm that I am authorized to approve research in this setting and that this plan complies with the organization's policies.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside the student's supervising faculty/staff without permission from the Walden University IRB.

September 5, 2014

Re: Research Study

Dear Patricia Mason,

Based on my review of your research proposal, I give permission for you to conduct the study entitled Diffusion of Electronic Health Records in Rural Primary Care Clinics at the Medical Clinic. As part of this study, I authorize you to interview, and use member checking. The participation will be voluntary and at our own discretion.

We understand that our organization's responsibilities include interviews at the clinic. We reserve the right to withdraw from the study at any time if our circumstances change.

I confirm that I am authorized to approve research in this setting and that this plan complies with the organization's policies.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of the student's supervising faculty/staff without permission from the Walden University IRB.

Sincerely,