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Health Care Leaders' Experiences of Electronic Medical Record Adoption and Use

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This is to certify that the doctoral study by

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2016

Abstract

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MA, Webster University, 2004

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Doctoral Study Submitted in Partial Fulfillment

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Abstract

Adoption of electronic medical record (EMR) technology systems of meaningful use has been slow despite the mandate by the U.S. government. The purpose of this single case study was to explore strategies used by health care leaders to implement EMR technology systems of meaningful use to take advantage of federal incentive payments. Diffusion of innovation theory provided the conceptual framework for the study. Semistructured interviews were conducted with 6 health care leaders from a military installation in the Southeast United States. Data were analyzed using software, coding, and inductive analyses. The 3 prominent themes were patient, provider, and champion. Alerts from an EMR technology system can increase providers' awareness and improve patient safety. Providers' involvement in every phase of an EMR system's implementation can improve the adoption rate. Champions play a critical role in successful adoption and implementation of EMR systems. Results of this study may assist health care leaders in implementing EMR systems to take advantage of federal incentive payments. Implications for positive social change include enhanced delivery of safe, high-quality health care.

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Dedication

This study is dedicated to my soul mate, Jennifer Weagraff, and three loving sons, Anthony, Zachary, and Brandon, who supported my efforts toward completion of my degree. Furthermore, I would like to thank my sister for constantly reminding me to complete my study.

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First, I would like to thank Dr. Jorge Gaytan for all of your encouragement and guidance you provided during my doctoral journey. Your responsiveness and availability made my experience enjoyable and less stressful. Second, I would like to thank the Doctor of Business Administration (DBA) department for assigning Dr. Gaytan as my chair, replacing my previous chair. Next, I want to thank my other two committee members, Dr. Edward Paluch and Dr. Roger Mayer, for all of your time and participation. In closing, I want to thank all of the participants and the organization for granting me access and taking time in assisting me with my study.

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Section 1: Foundation of the Study

Even though the U.S. government promotes and regulates adoption and meaningful use of electronic medical record (EMR) technology systems, health care industry leaders and physicians remain reluctant to adopt them (Ancker et al., 2013). Furthermore, the United States remains well below other nations in the percentage of adoption. Listening to and learning from health care leaders may improve EMR technology system adoption and use. Health care leaders play a critical role in the adoption and successful deployment of an EMR technology system.

Background of the Problem

In 2004, President Bush initiated a nationwide requirement of electronic medical records (Mostashari, 2012). The targeted timeline was 10 years. President Obama enacted the Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009, which "directed the Office of the National Coordinator for Health Information Technology (ONC) to promote the adoption and meaningful use of electronic health records (EHRs)" (Charles, King, Patel, & Furukawa, 2013, p. 1). Anticipated benefits included improvement in health outcomes, decrease in medication errors, decrease in health care costs, and strengthening of disease management (Radley et al., 2013).

Federal incentives entice physicians and health care leaders to adopt and use electronic medical records. According to Agha (2014), federal incentives are expected to increase to $30 billion by 2019. In 2011, the Medicare Electronic Health Records Incentive Program (MEHRIP) of the Centers for Medicare and Medicaid Services paid the first adopters of a meaningful use electronic medical record (Hsiao et al., 2013).

Nambisan, Kreps, and Polit (2013) identified a gap of knowledge concerning the measurement of benefits perceived by physicians to influence electronic medical record adoption. An additional gap of knowledge includes physicians' ability to demonstrate how they meet the different stages of meaningful use (Hochron & Goldberg, 2014). Physicians' experiences regarding the adoption and use of EMR warrant further study.

Problem Statement

The U.S. government has mandated that health care organizations must promote the adoption and meaningful use of EMR technology systems (Charles et al., 2013). Despite the mandate, only 59% of hospitals currently use some form of EMR technology systems (Charles et al., 2013). Botta and Cutler (2014) found that hospitals adopting basic EMR technology systems of meaningful use collected over $8 billion in federal incentive payments. The general business problem was that many hospitals are experiencing a slow adoption of EMR technology systems of meaningful use. The specific business problem was that some health care leaders lack strategies to implement an EMR technology system of meaningful use to take advantage of federal incentive payments.

Purpose Statement

The purpose of this qualitative single case study was to explore strategies used by health care leaders in implementing an EMR technology system of meaningful use to take advantage of federal incentive payments. I selected six health care leaders from a military installation located in the Southeast United States. Results may contribute to increased knowledge of the social and financial benefits associated with the

implementation of EMR technology systems of meaningful use, and hospitals could use the federal incentives to improve the health care services delivered to communities.

Nature of the Study

I used a qualitative approach and a single case study design. I selected a qualitative approach because it allows for exploration of participants' perspectives and description of their experiences (Williams, 2011). I did not select a quantitative approach because I did not intend to use numerical data or test hypotheses (Yin, 2014). I did not select a mixed-methods approach because I did not have identifiable variables and therefore could not satisfy the quantitative portion of a mixed-methods study (Yin, 2014).

Williams (2011) described three qualitative designs, including (a) case study, (b) ethnographic, and (c) phenomenological. A case study concentrates on individuals who experienced the event being studied (Williams, 2011). Exploring a program, event, activity, or process (Yin, 2014) can assist health care leaders and private practice physicians in adopting an EMR technology system. An ethnographic design was not used because of the long-term requirement for data collection (Yin, 2014). A phenomenological design was not chosen because I was not concerned with individuals' lived experiences (Yin, 2014). Because a case study design focuses on how or why a phenomenon operates and allows the researcher to collect data to analyze real-world experiences (Yin, 2014), I determined that the case study design was the most suitable for my study.

Research Question

The overarching research question for this study was as follows: What are the strategies used by health care leaders to implement EMR technology systems of meaningful use to take advantage of the federal incentive payments?

Interview Questions

1. How many months/years' experience do you have using an EMR technology system?
2. What is your role in the emergency room and what was your involvement in the EMR technology system implementation?
3. Do you consider yourself a super-user/clinical champion?
4. What impact does an EMR technology system have on the efficiency of an emergency room?
5. How important is a super-user/clinical champion in the implementation of an EMR technology system?
6. How can providers be utilized to improve the implementation/sustainment of an EMR technology system?
7. How does an EMR technology system affect the emergency room workflow?
8. What do you consider the advantages of using an EMR technology system?
9. What do you consider the disadvantages of using an EMR technology system?
10. What are your experiences of the EMR technology system implementation?

11. What are your experiences of the EMR technology system training conducted?
12. If you were to go back in time, what would you have done differently during the implementation of the EMR technology system?

Conceptual Framework

The diffusion of innovation theory, originated in 1962, involves communication of innovation across an organization for a period of time to all users (Rogers, 2002). Although an EMR technology system cannot be defined as a new innovation, a recent implementation to an emergency department supports the selected theory. The participating emergency department's first-time use of an EMR technology system can be considered as a new innovation. Innovation represents adoption of a change in process or application for documentation (Rogers, 2002). Rogers' five key elements of diffusion of innovation theory include (a) innovation, (b) adopters, (c) communication channels, (d) time, and (e) social system.

The diffusion of innovation theory has been successfully used in areas such as business, anthropology, health care, and education (Luo, Li, Zhang, & Shim, 2010). Mills, Vavroch, Bahensky, and Ward (2010) used diffusion of innovation theory during a similar study assessing leadership's perspectives on anticipated and realized benefits of EMR technology systems. Furthermore, Greiver et al. (2011) utilized diffusion of innovation theory to explain the implementation of technology similar to EMR. Consistent with the diffusion of innovation theory, Mills et al. identified early adopting health care organizations in Iowa and echoed the fact that the diffusion of EMR appears

slow throughout the United States. The U.S. government supports a national diffusion of innovation involving adoption of EMR technology systems. Interviewing and documenting the experiences of end users may assist health care leaders in achieving the government's goal.

Operational Definitions

Several medical and information technology terms were used in the study. The following definitions provide clarification of their use:

Clinical champions: Clinical staff members possessing and displaying a positive attitude or enhanced aptitude toward adoption of an EMR technology system (Ancker et al., 2013).

Computerized physician order entry (CPOE): An HIT capability for physicians to enter medical orders for medications electronically (Lee, Kuo, & Goodwin, 2013).

Electronic medical record (EMR): An electronic technology system that documents patients' health care replacing paper documentation (Lee et al., 2013).

End users: Health care staff members utilizing a computer to document health information (Saleem et al., 2014).

Health information technology (HIT): Software or hardware supporting the delivery of health care (Lee et al., 2013).

Health care leaders: Individuals who effectively impact an organization as a change agent (Rogers, 2002). Health care leaders include providers critical in the decision-making for EMR technology system adoption (Lanham et al., 2014).

Meaningful Use: Criteria of information technology (IT) advancements that the health care industry should follow for improvement in quality, efficiency, and safety of health care (Estabrooks et al., 2012).

Assumptions, Limitations, and Delimitations

In this section, the assumptions, limitations, and delimitations of the study are presented. These three areas are important to inform the reader of the scope of the study.

Assumptions

An assumption is a claim about the study presumed to be true (Willig, 2013). A primary assumption of this study was the low adoption rate of EMR technology systems in the United States. During the study, current statistics appeared to required further research. Nevertheless, I assumed that a low adoption rate would continue. I also assumed that participants would answer interview questions honestly. Finally, I assumed participants understood their role in the study.

Limitations

A limitation is an element that can be controlled by the researcher (Simon & Goes, 2013). Large turnover of emergency department staff participating in the EMR adoption may have limited the pool of participants. Additionally, the time elapsed between the EMR technology system adoption and date of interview may have influenced the memory of physicians interviewed. My subjectivity also constituted a possible limitation. My experiences related to emergency departments' EMR technology system adoption may have influenced my analysis of the data.

Delimitations

Delimitations include boundaries developed according to the design of a study (Simon & Goes, 2013). A delimiter for this study was research participants within a military hospital in the Southeast United States. Furthermore, this study was limited to six health care leaders who practiced paper documentation for a long time prior to converting to an EMR technology system.

Significance of the Study

The purpose of this qualitative single case study was to explore strategies used by health care leaders in implementing an EMR technology system of meaningful use to take advantage of federal incentive payments. According to Hochron and Goldberg (2014), physicians wish to have their voices heard. I used the diffusion of innovation theory, which includes the following five steps in the innovation process: (a) identify needs of the environment, (b) identify problems to be solved, (c) conduct problem analysis and solutions, (d) generate solutions evaluations, and (e) form value proposition (Yezersky, 2007). Information obtained from interviews with physicians may reveal strategies organizations can use to adopt EMR technology systems.

Contribution to Business Practice

A qualitative study addressing health care leaders' experiences regarding adoption and use of EMR technology systems may benefit health care leaders and decrease resistance to EMR technology adoption. Health care leaders' peer-to-peer communication may assist other health care leaders in understanding the benefits of EMR adoption (Botta

& Cutler, 2014). Strong leadership influences the success of the adoption (Ancker et al., 2013).

According to Kellermann and Jones (2013), the United States could save an estimated $81 billion annually by using EMR technology systems. Organizations may experience cost savings by decreasing patient length of stay, nurse shortages, repeated ancillary orders, and administrative expenditures (Lee et al., 2013). Moreover, results from this study may assist the government in achieving the 100% adoption rate. Furthermore, health care organizations and independent physicians may benefit by capitalizing on part of the $30 billion in federal incentives (Hsiao et al., 2013). Finally, hospitals may benefit from analyzing data generated from EMR technology systems to make informed business decisions (Lanham et al., 2014). Wolf, Harvell, and Jha (2012) explained that hospitals that ignore meaningful use would face financial deductions.

Implications for Social Change

The social impact of EMR technology systems includes quality and continuity of care, legibility, accuracy, patient safety and satisfaction, and physician satisfaction (Cimino, 2013; Jones et al., 2013). Quality of care can be broken down into additional social advantages including electronic discharge instructions, patient appointment reminders, and appointments (Frimpong et al., 2013). Hsiao et al. (2013) explained the benefit of patients viewing their health care records. Tricare provides this capability to their Department of Defense beneficiaries.

Embi et al. (2013) identified several other benefits for social change, including continuity of care and prescribing medications. Another social change benefit includes

more secure messaging communication between patient and physician. Secure messaging can improve medication prescriptions by automating refill requests, saving time, and increasing appointment availability. Embi et al. discovered that once physicians begin to use EMR technology systems, they refuse to return to other means of documentation.

A Review of the Professional and Academic Literature

The drive behind this qualitative single case study was to explore health care leaders' real-world experiences to identify the strategies used by health care leaders to implement an EMR technology system of meaningful use to take advantage of the federal incentive payments. Health care leaders play a critical role in the success or failure of EMR technology systems of meaningful use. My overarching research question for this research was as follows: What are the strategies used by health care leaders to implement an EMR technology system of meaningful use to take advantage of the federal incentive payments? The purpose of the literature review was to examine previous literature pertaining to the adoption of an EMR technology system of meaningful use. I organized the literature review by focusing on the following themes: (a) government involvement, (b) EMR origin, (c) meaningful use, (d) physicians role, (e) clinical champions, (f) project management, (g) change management, (h) emergency department, (i) barriers, (j) cost, (k) vendor selection, (l) IT support, (m) privacy, (n) interoperability, (o) computer literacy, (p) workflow, (q) usability, (r) time, (s) benefits, (t) quality of care, (u) patient safety, (v) financial, (w) communication, (x) efficiency, and (y) accuracy.

My review included 115 sources, of which 101 (87%) were peer-reviewed and 106 (92%) were published within 5 years of my anticipated graduation. I used Walden

University's databases and Google Scholar as the primary search engines. References were located using the following databases: ABI/INFORM Complete, ProQuest Health & Medical Complete, Health Technology Assessments, MEDLINE, PubMed, and ScienceDirect. Key words used to identify peer-reviewed references included *EMR*, *EHR*, *electronic*, *medical*, *record*, *health*, *meaningful use*, *provider*, *physicians*, *perception*, *adoption*, *benefits*, *barriers*, *implementation*, and *information technology system*.

Diffusion of Innovation Theory

Five key elements that make up Rogers' diffusion of innovation theory include (a) innovation, (b) adopters, (c) communication channels, (d) time, and (e) social system. I identified several articles that included diffusion of innovation theory to explore the adoption of EMR technology systems (Cresswell & Sheikh, 2013; Greiver et al., 2011; Luo et al., 2010; Mills et al., 2010). Consistent with the diffusion of innovation theory, Mill et al. found that previous researchers identified early adopting health care organizations and noted that the diffusion of EMR appeared to be slow throughout the United States. Emani et al. (2012) concluded that the diffusion of innovation theory assisted in the exploration of patients' perceptions of a personal health record.

Other theories and conceptual frameworks precede studies related to EMR technology systems. Fareed, Ozcan, and DeShazo (2012) utilized organizational theory to explore the organization integration of an EMR technology system selection. According to Fareed et al., organizational theory's strength includes the investigation of an entire organization. The reason I did not use this theory is that my study focused on EMR technology system adoption, implementation, continued use, and end users' experience.

Diffusion of innovation concentrates on the adoption by the end users and their communications regarding adoption and use (Kaminski, 2011). Another theory observed in my literature review was a systems approach focusing on effects of EMR technology system adoption across three levels: (a) political environment, (b) organization, and (c) patient (Nambisan et al., 2013). I did not choose this theory because my study did not address the EMR technology system's impact on patients.

Diffusion of innovation theory is a proven theory to explain the implementation of technology similar to an EMR technology system (Greiver et al., 2011). Mills et al. (2010) noted that the acronyms EMR and EHR cause confusion during the analysis of technology diffusion. Mills et al. also mentioned that diffusion of innovation theory contributes to the prediction of EMR adoption success. Furthermore, Griever et al. stated that diffusion of innovation theory can assist leaders during the implementation of EMR technology systems. Mills et al. argued that diffusion of innovation theory does not assist in an organization's decision to implement an EMR technology system.

Greiver et al. (2011) utilized diffusion of innovation theory to explore physicians' perceptions of EMR technology system implementation. Greiver et al. found multiple barriers of EMR technology systems adoption, which supports the use of diffusion of innovation theory as my conceptual framework to explore health care leaders' perceptions of an EMR technology system. Moreover, Greiver et al. chose the following elements of Rogers' diffusion of innovation theory: (a) relative advantage, (b) compatibility, (c) complexity, (d) observability, (e) reinvention, (f) organizational size, (g) organizational slack, (h) presence of champion, and (i) supportive leadership. Greiver

et al. discovered that Rogers' diffusion innovation of theory correlated with difficulties of organizational EMR technology system adoption. The specific theoretical elements affecting EMR technology systems implantation included (a) lack of relative advantage, (b) high complexity, and (c) low compatibility. Greiver et al. explained that emphasis on recruiting early adopters (i.e., clinical champions) improved the physicians' perceptions regarding EMR technology system adoption. Clinical champions could assist in influencing resistant physicians, improving change management, and enhancing workflow training.

Zhang, Yu, Yan, and Spil (2015) applied diffusion of innovation theory to explore patients' perceptions of an electronic appointment system. Zhang et al. focused on the following theoretical components: (a) determinants of success, (b) communication channels, and (c) end user perceived qualities. Rogers' diffusion of innovation theory assisted Zhang et al. in determining that a patient's adoption of an electronic appointment system depended on the patient's characteristics and the product of communication channels. Other theoretical attributes utilized by Zhang et al. included (a) relative advantages, (c) compatibility, (c) complexity, and (d) trialability.

Butler et al. (2012) used diffusion of innovation theory to explore a clinical staff's barriers and perceptions of a personal health record. Butler et al. explained that change agents (i.e., clinical champions) play an important role in the improvement of the communication channel and deployment of social change. Butler et al. categorized theoretical themes including relative advantage, compatibility, observable benefits, trialability, and complexity. Butler et al. reported that relative advantage and observable

benefits were predominantly mentioned during the interviews. Butler et al.'s themes supported my selection of Rogers' diffusion of innovation theory as the conceptual framework for my study.

Government Involvement

The U.S. government enacted the HITECH Act of 2009 to allocate approximately $30 billion to stimulate and assist electronic medical record system adoption (Hsiao et al., 2013). Since the launch of federal incentive programs and regional extension centers, the electronic medical record adoption rate has increased (Ancker et al., 2013). Ancker et al. acknowledged that even though assistance is available, physicians' adoption rate remains low. The government expects all hospitals and physicians to adopt electronic medical record systems to decrease health care costs and improve safety and efficiency (Adler-Milstein, Everson, & Lee, 2014).

Despite government involvement, nationwide adoption remains incomplete and sluggish. Furthermore, considering the proposed benefit of the electronic medical record, adoption appears to remain slow. Charles et al. (2013) reported that in 2013 roughly six out of 10 hospitals used a basic electronic medical record. Adoption varies based on the type of practice, location, and technical assistance available (Ryan, Bishop, Shih, & Casalino, 2013). Furthermore, a physician's age may contribute to the slow adoption rate (Decker, Jamoom, & Sisk, 2012). Ancker et al. (2013) found that physicians in small practices remain the largest group resisting adoption. Physicians' perceptions of barriers can inhibit adoption and meaningful use of electronic medical record systems. Furthermore, the government may improve EMR technology system adoption by

deploying Roger's diffusion of innovation theory. Early identification and utilization of physicians meeting the category of innovator and early adopter can help the U.S. adoption rate (Rogers, 2002).

When monitoring the progress of electronic medical record implementation, the U.S. government relies on organizations similar to the health care Information and Management Systems Society, which created stages to evaluate electronic capabilities (Kumar & Aldrich, 2010). Kumar and Aldrich's evaluation tool ranges from 0 to 7, depending on the health care organization's capabilities. Stage 0 contains no electronic record, Stage 1 contains ancillary services (i.e., laboratory, radiology, and pharmacy), Stage 2 contains clinical data repository, Stage 3 contains clinical documentation, Stage 4 contains computerized physician order entry (CPOE), Stage 5 contains completed medication administration, Stage 6 contains physician documentation, and Stage 7 contains a complete electronic medical record sharing information and interoperable. The U.S. government considers interoperability as the ultimate goal for the electronic medical record system. Interoperability enables all electronic medical record systems to communicate with each other (Richardson et al., 2015).

EMR Origin and Meaningful Use

The origin of the first electronic medical record systems varies, according to Mandl and Kohane (2012), and may be as early as 1966 or the early 1970s (Cimino, 2013). The recent initiative for nationwide electronic medical record system adoption can be accredited to Presidents Bush and Obama (Mostashari, 2012). The electronic medical record and other health information technology solutions provide a bright future for

health care. Compared to other countries, statistics show that U.S. physicians lag in the use of electronic medical records (Kumar & Aldrich, 2010). The U.S. government's proposed benefits of electronic medical records include (a) decreased costs, (b) increased quality of care, and (c) improved patient outcomes (Buntin, Burke, Hoaglin, & Blumenthal, 2011). Moreover, Cimino stated that early adopters of electronic medical record systems reported improvements in legibility and availability of patients' health information.

Meaningful use is a product of the American Recovery and Reinvestment Act (ARRA), finalized by the U.S. Department of Health and Human Services (HHS) (Charles et al., 2013). DesRoches et al. (2013) reported that diffusion of innovation theory and the use of incentives might explain an increase in EMR technology system adoption. A measurement of meaningful use assists in determining a hospital's use of health information technology to receive federal incentives. Estabrooks et al. (2012) identified three stages of meaningful use. Stage 1 involves data capturing and sharing, Stage 2 promotes clinical documentation, and Stage 3 supports improved patient outcomes. Ford, Huerta, Menachemi, Thompson, and Yu (2013) noted that many hospitals continue to disregard meaningful use requirements. The U.S. government mandates that hospitals attain meaningful use by 2015 to obtain full incentives associated with Medicare and Medicaid payments (Hsiao, Hing, Socey, & Cai, 2012). Physicians must demonstrate meaningful use of electronic medical record system (Hsiao et al., 2013).

Charles et al. (2013) reported that 41% of hospitals in the United States remain nonadopters of electronic medical records. For research purposes, established thresholds determine electronic medical record system capabilities, ranging from a comprehensive to a basic system (Hsiao et al., 2012). Kellermann and Jones (2013) reported that, in 2013, approximately 27% of hospitals and 40% of physicians deployed some form of basic electronic medical record. The majority of physicians resisting electronic medical record adoption belong to independent physician practices (Audet, Squires, & Doty, 2014). Furthermore, Hsiao et al. (2013) reported that physicians practicing in a community with 15% or lower poverty displayed a low rate of electronic medical record use.

Physicians Role

Physician questions are related to the (a) appreciation of the importance of electronic medical records, (b) knowledge of the project goals, and (c) understanding of every type of physicians' involvement (Hochron & Goldberg, 2014). Physicians can also assist the project team by working with other physicians on workflow issues. Physicians expressed apprehension about the anticipated time to implement an EMR technology system (Farzianpour, Amirian, & Byravan, 2015). Social barriers included a limited amount of support from peers, external entities, and leadership (Farzianpour et al., 2015). According to Farzianpour et al., organizational size and type present an additional barrier because smaller private physician practices may be deficient in HIT support compared to larger hospitals.

Psychological barriers include physicians' lack of faith in the EMR technology system and fear of losing control (Farzianpour et al., 2015). These psychological barriers warrant the use of diffusion of innovation theory because of its success in social system studies (Rogers, 2002). Evidence supports physicians' impact on EMR technology system adoption and physicians demonstrating that an EMR technology system's capabilities could convince skeptical adopters (Ingebrigtsen et al., 2014).

Clinical Champions

Physicians, as clinical champions, and effective training can contribute to the success of the project (Ancker et al., 2013). Clinical champions can assist during change management to influence peers to adopt the use of electronic medical record system (Hochron & Goldberg, 2014). Moreover, health care leadership should encourage the recruitment of clinical champions and afford them administrative time to address clinical champion duties (Shea & Belden, 2016). Shea and Belden (2016) stated that health care and project leaders should encourage clinical champions during electronic medical record system's deployment, workflow development, training, and sustainment. Health care and project leaders should begin communication with clinical champions at an early stage of EMR technology system adoption. Devore and Figlioli (2010) recommended alternate means of communication, such as newsletters, committees, and face-to-face meetings.

Sykes, Venkatesh, and Rai (2011) discovered the importance of the role that physicians play as clinical champions. Clinical champion physicians can convince fellow non-adopter physicians to accept an EMR technology system. Furthermore, Sykes et al. explained that clinical champion physicians could improve an EMR technology system

selection and design. According to Sykes et al., clinical champion physicians' involvement in system design could lead to a more in-depth training focused on current physician workflow. Furthermore, training should be based on best business practices (Embi et al., 2013). According to Rogers (2002), the diffusion of innovation theory consists of 2.5% innovators and 13.5% early adopters. These percentages could lead someone to view physicians as clinical champions. Ancker et al. (2013) reported the importance of clinical champions to improve the buy-in of an EMR technology system adoption.

Training plays a critical element for a successful electronic medical record system deployment. The government agencies address training needs by providing training through the regional extension centers (Decker et al., 2012). Jamoom, Patel, Furukawa, and King (2014) identified inadequate training as a major barrier physicians face when using EMR technology systems. Moreover, creating a training curriculum exemplifying an EMR technology systems' capability to deliver benefits may influence non-adopter physicians (Sykes et al., 2011).

Munyisia, Yu, and Hailey (2011) recommended several modalities to train medical staff and the trainer, including over-the-shoulder, hands-on, and one-by-one sessions. Other modes of training include web-based, classroom, EMR functionality, case-based, role-based, process-based, and mock-clinic (Dastagir et al., 2012). During electronic medical record system deployments, Shea and Belden (2016) discovered that hands-on or over-the-shoulder training proved most effective because it affords physicians an opportunity to receive immediate answers to their system workflow

questions. Furthermore, Devore and Figlioli (2010) explained that physicians learn more from using an EMR technology system in their real-world environment.

Project and Change Management

Kellermann and Jones (2013) described a successful project as an implementation of electronic medical record system without interruption of workflow. According to Nambisan et al. (2013), 80% of electronic medical record system projects ultimately fail. Project leaders can benefit by including physicians during all phases of project management. Hochron and Goldberg (2014) recommended that project leaders should not assume team members understand physicians' needs. The project leaders may confront resistance from health care leadership. Health care leadership depends on physicians to conduct appointments to produce revenue. However, Hochron and Goldberg mentioned that physicians should be involved in projects prior to implementation to answer questions.

Change management considerations play a critical role during the adoption of any health information technology. Shea and Belden (2016) recommended that special attention should concentrate on change management, identifying perceptions of physicians' acceptance. Furthermore, physicians play a critical role in any health information technology initiative. According to Shea and Belden, physicians fulfill the role as clinical champions; the value of clinical champions includes communication from peer to peer in support of change and assists in the design, workflow, and training. Rogers (2002) identified that the majority (34%) of early adopters found in diffusion of innovation need some form of evidence. The impact that an EMR technology system

CPOE has on quality of care can improve diffusion of innovation (Kazley & Diana, 2011).

Implementation Emergency Department Issues

According to Ben-Assuli, Leshno, and Shabtai (2012), emergency departments (ED) display a low adoption of EMR technology systems. The hospital's emergency department participating in this study recently experienced an implementation of an electronic medical record. A few primary initiatives for converting from paper to electronic targeted an improvement in legibility and continuity of care. Frimpong et al. (2013) identified that electronic medical record systems improve access to patient information. An emergency department can be defined as a busy and complex area within a hospital. Park, Lee, and Chen (2012) made three recommendations for deploying an electronic medical record system to an ED (a) create electronic documentation to match the workflow, (b) establish clear roles and responsibilities, and (c) ensure that the electronic medical record system is flexible to allow for complex uncertain workflow of a medical environment.

Barriers. Identifying how to overcome barriers and validate the benefits of electronic medical record systems may improve the adoption rate. Overcoming the barriers may provide the largest impact on resistance to adopting electronic medical record systems. According to Farzianpour et al. (2015), barriers are categorized as follows: (a) cost, (b) vendor selection, (c) technical support, (d) privacy, (e) interoperability, (f) computer literacy, (g) workflow, (h) usability, and (i) time. According to Greiver et al. (2011), physicians perceive EMR technology systems as complex,

inflexible, and do not fulfill their needs. According to Rogers (2002), approximately 85% of the categories of adopters rely on evidence or until they recognize that the majority of their peers have become adopters, before adopting innovation. The lack of an EMR technology systems' buy-in can be considered a barrier (Ancker et al., 2013).

A primary cause of slow electronic medical record adoption and use involves barriers among physicians and leaders. Physician barriers include cost and lack of finances, privacy and security, lack of computer skills, interference of the encounter, and fear of change (Ancker et al., 2013; Bhavsar, Martin, Bennett, & Thornburg, 2014). Leadership barriers include costs and concerns about a return on investment (Ancker et al., 2013; Bhavsar et al., 2014). Smaller practices may consider the lack of technical support as an important barrier. Physician perceived barriers include difficulty of use, lack of standard documentation, and patient encounter interruption (Park et al., 2012). Furthermore, patient-encounter interruption alludes to the aforementioned barrier of time. Physicians may feel as though the increased time to use electronic medical record interrupts the encounter.

Furthermore, leaders of smaller medical practices experience a barrier resulting from a lack of technical support (Ancker et al., 2013). The remaining barriers involve legal concerns, addressing patient privacy, and change process management, addressing physicians' change in clinical workflow (Farzianpour et al., 2015). Leung (2012) found that user satisfaction impacts the implementation of EMR technology systems. Furthermore, project leaders of electronic medical record technology system implementation appreciate the importance of physician involvement in EMR

implementation (Botta & Cutler, 2014). Moreover, additional contributing factors of a successful deployment include supportive leadership, technical support, workflow connection, and physician involvement (Ancker et al., 2013; Spetz, Burgess, & Phibbs, 2012).

Cost. Cresswell, Bates, and Sheikh (2013) identified that the cost of an EMR technology system directly impacts the success or failure of the adoption. Furthermore, the cost of an EMR technology system represents a primary barrier; however, the additional cost associated with the implementation expounds this barrier (Jamoom et al., 2014; McAlearney, Sieck, Hefner, Robbins, & Huerta, 2013). According to Jamoom et al. (2014), 73% of EMR technology system non-adopters attribute their decision to the cost barrier. Some of these additional costs can include: maintenance fees, IT support, and reduction in revenue during implementation (Pipersburgh, 2011). Aligning with my conceptual framework, Sykes et al. (2011) emphasized the importance physicians' decision on adopting an EMR technology system.

According to Pipersburgh (2011), the cost of an EMR technology system range between $3 - $200 million, depending on the size of hospital. This cost can depend on three application strategies, including single vendor, best of breed, and best of suite (Fareed et al., 2012). Previous literature identified, using business case analysis can help determine a predicted return on investment, assisting the decision-makers to adopt an EMR technology system (Zhivan & Diana, 2012). Furthermore, government organizations similar to the U.S. Department of Health and Human Services and Agriculture offer monies toward EMR technology system adoption (Wang, Wang, &

Biedermann, 2013). Private practice physicians can take advantage of government assistance, especially since they lack other parties to share costs (Kokkonen et al., 2013).

Vendor selection. Vendor selection and other vendor interactions, represent another barrier in EMR technology system adoption and implementation (Botta & Cutler, 2014; Farzianpour et al., 2015; Wang et al., 2013). Furthermore, vendor selection contributes to the cost of an EMR technology system (Richardson et al., 2015). Wang et al. (2013) suggested four additional vendor costs to consider: warranties toward meaningful use; testing and acceptance cost, payment plan and termination privileges. Farzianpour et al. (2015) suggested that vendors continue to increase EMR technology system costs even after the implementation. According to Wang et al., in attempts to address the cost barrier, application services for funding assistance are offered by vendors.

The immaturity of health care industry's technology and vendors proliferates the difficulty of vendor selection (Richardson et al., 2015). Smaller hospitals and private practices rely on vendors to supply technology expertise (Adler-Milstein et al., 2014). Combining the complexity of an EMR technology system implementation, lack of qualified vendors, and technology infancy delineates health care leaders' conundrum. The decision of vendor selection presents the following approaches: leasing, single vendor, best of breed, best of suite, and homegrown systems (Alder-Milstein et al., 2014; Fareed et al., 2012; Wang et al., 2013).

Vendors blame an EMR technology system of meaningful use as a contributing factor toward the difficulty of meeting customer requirements (Botta & Cutler, 2014).

Botta and Cuter (2014) stated that the vendors' inability to deliver meaningful use tasks is due to systems interoperability, public health reporting, and patient personal device health tools, which may prevent qualification for collection of federal incentives. Moreover, Kellerman and Jones (2013) stated that some leading EMR vendors resist system interoperability. In the future, physicians and vendors should work together to overcome the important barrier (Jones et al., 2013). Jones et al. (2013) mentioned that physicians could provide information to the vendors to ensure workflow considerations and medical practice safety, efficiency, and job satisfaction.

Furthermore, physicians favor a vendor that offers an EMR technology system with ease-of-use considerations (Kellerman & Jones, 2013). Hochron and Goldberg (2014) recommended the use of physicians' survey to assist in the development of an EMR technology system adoption plan. The seven elements of Hochron and Goldberg's survey included (a) physicians EMR adoption receptivity, (b) training modality, (c) interest in clinical champion volunteering, (d) interest in creating order sets, (e) physicians interest in EMR technology system implementation, (f) physician communication, and (g) physicians' perception of a hospital system.

Technical support. Technical support during all phases of an EMR technology system adoption represents the technical complexities, which become responsibilities of organizational leadership (Kellerman & Jones, 2013). Shae & Belden (2016) found that organizations possessing experienced IT departments increase their chances of a successful EMR technology system adoption. Moreover, it is recommended that technical professionals possess advanced communication and change management experience

(Khatri & Gupta, 2014). Furthermore, additional key members of IT support that play a critical role in EMR adoption are the chief medical officer and chief information officer (Khatri & Gupta, 2014; Shea & Belden, 2016).

The Federal Government dedicated four years and approximately $721 million toward technical support promoting EMR technology system adoption (Blumenthal, 2011). The Office of the National Coordinator for Health Information Technology and regional extension centers represents a few of the organizations assisting technical needs during adoption and implementation (DesRoches et al., 2013; Singh, Lichter, Danzo, Taylor, & Rosenthal, 2012). Unlike larger hospitals, rural hospitals and private practices require heavily on external technical support (Kellerman & Jones, 2013). Vendors offer technical support for these smaller organizations. However, Shachak et al. (2013) recommended that health care professional technical manuals work better than vendor technical manuals.

Privacy and security. Privacy and security represent one of the elements of meaningful use, established by the HITECH Act (Wang et al., 2013). The primary purpose of the Office of the National Coordinator for Health Information Technology (ONC) and the Health Information Technology Policy Committee (HITPC) includes the assurance of privacy and security of patient health information (Fox, 2013). Furthermore, regional extension centers ensure the privacy and security of patient health information (Bhavsar et al., 2014).

Physicians' primary concern about EMR technology system is the EMR's capability to ensure patient information privacy and security (Farzianpour et al., 2015).

Farzianpour et al. stated that inadequate protection of patient health information can lead to legal problems. The majority of patient health information privacy and security breaches occur due to human error, not technical (Bluemental, 2011). One of the five main factors of diffusion of innovation theory includes relative advantage, which is an innovation improvement compared to previous processes (Rogers, 2002). Greiver et al. (2011) determined that an EMR technology system's implementation failed to demonstrate relative advantage. However, comparing a paper-based medical records privacy and security to an EMR technology system may improve a relative advantage (Jamoom et al., 2014).

The United States' attempt to regulate patient information privacy resulted in the creation of the Health Insurance Portability and Accountability Act (HIPAA) (Alassia, Benítez, Luna, & de Quiros, 2015). According to Jamoom et al. (2014), some EMR non-adopters may not be aware of HIPAA regulations. Furthermore, some non-adopting organizations consider EMR technology systems' privacy and security requirements costly, a potential threat and risk (Farzianpour et al., 2015). Emphasis on privacy and security can directly impact EMR's efficiency as well as user and patient satisfaction (Sinsky, Beasley, Simmons, & Baron, 2014).

Some patients are concerned about the EMRs ability to store information privately, which may cause patients to withhold health information causing detrimental health outcomes (Bluementhal, 2011). An additional barrier associated with patient health information privacy and security includes inadequate trained staff to properly address privacy and security issues (Heisey-Grove, Danehy, Consolazio, Lynch, & Mostashari,

2014). Patient health information privacy and security is considered the most complex risk associated with EMR system technology adoption (Hiller, McMullen, Chumney, & Baumer, 2011).

Interoperability and computer literacy. According to Shachak et al. (2013), interoperability is an EMR technology system that can communicate to other systems. Furthermore, Shachak et al. mentioned that interoperability allows clinicians to communicate and review health information with external sources. Interoperability represents one of the many barriers facing adoption of an EMR technology system (McClellan, Casalino, Shortell, & Rittenhouse, 2013). Furthermore, a system's interoperability can be found within the requirements of meaningful use (Rao et al., 2011). According to Rao et al. (2011), the United States Government invested approximately $30 billion in the past six years to encourage adoption of certified and interoperable EMR technology system. Shachak et al. stated that despite these efforts, EMR technology system vendors still struggle to offer interoperable systems.

In terms of computer literacy, physician characteristics include age, which can affect their computer literacy (Decker et al., 2012). According to Buntin et al. (2011) and Nambisan et al. (2013), computer literacy directly impacts an EMR technology systems implementation success. Some past studies consider computer literacy and general computer competencies as social aspects (Cresswell & Sheikh, 2013). The variance in computer literacy lays heavy emphasis on training of the EMR technology system (Dastagir et al., 2012). According to Rogers (2002), an innovation-influencing element of diffusion of innovation theory includes complexity. Addressing elements influencing

adoption can improve innovation. Health care organizations' senior or leading physicians demonstrating advanced IT knowledge could help overcome the complexity element (Ingebrigtsen et al., 2014).

Workflow. Researchers have identified the absence of workflow consideration as a primary barrier affecting physicians' acceptance of an EMR technological system (Ancker et al., 2013) mentioned the importance of including workflow within the EMR training. Furthermore, Ancker et al. (2013) explained that health care leaders should ensure that provider work schedules are modified to allocate an adequate number of training hours. Kokkonen et al. (2013) recognized that the theme of workflow could be identified as both, a barrier and benefit. Physicians consider that an EMR technology system can interfere with their workflow (Farzianpour et al., 2015; Kokkonen et al., 2013). However, Kokkonen et al. stated that some researchers have argued that EMR technology systems should improve workflow. Cresswell et al. (2013) discovered that the benefits of improved workflow might take an extended period of time. This discovery justifies the recommendation to identify target metrics, document current workflows, and determine whether desired outcomes are met.

Smaller practices lack the business analyst and IT staff to conduct proper workflow analysis (Greiver et al., 2011). According to Saleem et al. (2014), only a few studies exist that examine the impact that an EMR technology system has on workflow. Saleem et al. discovered that future studies should consider workflow-related topics including ergonomic aspects, exam room configuration, appointment preparation, and team workflow management. In addition, Saleem et al. recommended that future EMR

technology systems sanction clinical workflow to improve patient-provider communications. Diffusion of innovation can increase the number of innovators and early adopters, improving United States' overall adoption rate, particularly those younger providers with only clinical workflow experience with an EMR technology system (McAlearney et al., 2013).

The interoperable capability, known as Health Level Seven (HL7), helps improve clinical workflow (Richardson et al., 2015), as vendors struggle to overcome the interoperability (Shachak et al., 2013). Some of the IT solutions that help improve workflow include: clinical practice guidelines, decision-support applications, and clinical care plans (Mandl & Kohane, 2012). According to McAlearney et al. (2013), adopting a new EMR technology system includes the following six stages: (a) phasing, (b) workflow analysis, (c) training, (d) preloading, (e) mitigating, and (f) supporting. McAlearney et al. stated that the workflow analysis stage is critical to ensure proper use and prevent bad habits from crossing over from the legacy system.

Usability and time. Farzianpour et al. (2015) explained that an EMR technology systems complexity and increased difficulty to use frustrate physicians. Greiver et al. (2011) identified that an EMR technology system's usability can contribute to the success or failure in the adoption phase. Compatibility and complexity represent two main factors influencing diffusion of innovation (Rogers, 2002). Furthermore, usability considerations should be included during the development or customization of an organization's EMR technology system (Blavin, Ramos, Shah, & Devers, 2013). An additional factor for consideration in regards to usability is an EMR technology system's infrastructure

(Cresswell et al., 2013). An EMR technology system dependent on a wireless network could interrupt clinicians' workflow without proper coverage of access points. Shea and Belden (2016) recommended the use of clinical champions to assist health care leaders overcome the usability barrier.

Regarding time, it takes much time for physicians to learn how to use a new EMR technology system and even longer to master it (Farzianpour et al., 2015). Furthermore, organizations must accept a loss of revenue when physicians are required for training (Ancker et al., 2013). According to Farzianpour et al. (2015), physicians complain that they do not have time for training, claiming that their time is too precious to partake in the selection of an EMR technology system. However, Richardson et al. (2015) explained that physicians should be involved during in the selection process. A meticulous training strategy, limiting clinical interruptions, may help overcome this barrier.

Benefits

Previous literature identified benefits of an EMR technology system that include decreasing medication errors, improving health care, improving evidence-based practice, and ultimately improving patient satisfaction (Blavin et al., 2013). According to Buntin et al. (2011), the original benefits found in the HITECH Act included lower costs, better quality of care, and improved outcome. Despite all of these proposed and expected benefits, the United States' nationwide EMR technology system adoption rate remains low (Blavin et al., 2013; Butin et al. 2011).

An organization's success in implementing an EMR technology system hinges on the number of benefits (Cresswell et al., 2013). Identifying benefits can provide the

evidence required to influence early majority adopters, increasing diffusion of innovation (Rogers, 2002). Organizational leaders should be aware that benefits produced by an EMR technology system's adoption could take a long time to materialize. Furthermore, physicians' reception toward an EMR technology systems adoption is critical to achieve benefits (Hochron & Goldberg, 2014). Moreover, it is recommended to encourage physicians to help communicate the benefits associated with the adoption of an EMR technology system (Greiver et al., 2011).

Other benefits anticipated as result of an EMR technology system's adoption include the improvement of availability, legibility and completeness (Cimino, 2013). An EMR technology system's benefits can be both expected and realized. Mills et al. (2010) identified expected benefits, including quality of care, improved communication, patient safety, accuracy, efficiency, and a paperless system. King, Patel, Jamoom, and Furukawa (2014) discovered that 78% of physicians participating in their study reported that the EMR technology system improved patient care. The research by King et al. included the following metrics: access to patient's chart, alert of medication errors, alert of critical lab values, and other clinical decision aspects. Furthermore, Mills et al. discovered the importance of analyzing the expected benefits prior to implementation; in order to determine EMR technology systems realized benefits.

Quality of care and patient safety. One of the primary benefits expected from EMR technology systems include quality of care (Pipersburgh, 2011). The use of an EMR technology system can improve six components of quality, including (a) safety, (b) efficiency, (c) timeliness, (d) effectiveness, (e) patient-focused, and (f) equity (Mandl &

Kohane, 2012). Furthermore, the EMR technology system's capability of the CPOE directly impacts the quality of care (Kazley & Diana, 2011). Other capabilities offered by an EMR technology system that can measure quality of care include patient's discharge summaries, reminder systems, and automatically generated specialty care appointments (Frimpong et al., 2013). Quality benefits of an EMR technology system's implementation may take a long time for health care teams to realize.

Patient safety is one of three benefits aligned to the criteria of an EMR technology systems meaningful use (King et al., 2014). The improved communications caused by the EMR technology system can impact the safety of a patient (Struik et al., (2014). Patient safety is improved by the automated alerts and alarms within the EMR technology system. Furthermore, physicians' decision support during EMR documentation may improve and save patients' lives. According to Kazley and Diana (2011), CPOE provides evidence that an EMR technology system improves patient safety. Moreover, diffusion of innovation theory requires evidence to convince adopters to use innovation (Rogers, 2002).

Financial and communication. For-profit health care organizations, unlike any other business, depend on revenue to stay in business. EMR technology system selection and implementation can have an impact on earned revenue. According to Kumar and Aldrich (2010), an EMR technology system's benefits include safety and efficiency that may contribute to a 15-year ambulatory care savings of $11 billion.

Meaningful use of an EMR technology system determines whether or not a health care organization or private practice receives federal incentives (Hsiao et al., 2012).

Wang et al. (2013) discovered that the percentage of federal incentives differ based on a systems capability to communicate with other systems and to share data. In addition to earning incentives, the government anticipates that EMR technology systems will decrease health care costs (Pipersburgh, 2011).

An EMR technology system's effect on communication can be viewed as a benefit and a barrier (Buntin et al., 2011; Farzianpour et al., 2015). Moreover, communication is part of the diffusion of innovation theory (Rogers, 2002). Early adopting or innovative physicians' peer-to-peer communication can convince others to adopt an EMR technology system. Adopting a training strategy employing early adopting physicians to train late majority and lagging physicians can improve the success of an EMR technology system implementation (Jalota, Aryal, Mahmood, Wasser, & Donato, 2015). Buntin et al. (2011) stated that some physicians consider the use of an EMR technology system within the examination room as an interruption to patient-physician clinical dialogue. However, an EMR technology system's electronic patient portal can improve patient-physician communication (Richardson et al., 2015). Disjointed health care professionals use of EMR technology systems can improve communication (Struik et al., 2014). Chao, Hu, Ung, and Cai (2013) mentioned that an EMR technology system's clinical communication enhances physicians' disease management.

Efficiency. Previous literature identified that an EMR technology system should improve efficiency of care (Cresswell et al., 2013). However, the barrier associated with interruption of workflow does not outperform the improvement of efficiency. Furthermore, efficiency and quality of care pose a problem for statisticians to analyze

data quantitatively. Farzianpour et al. (2015) explained that physicians consider improvements in efficiency as an influential topic. The diffusion of innovation theory listed five elements influencing innovation, including (a) relative advantage, (b) compatibility, (c) complexity, (d) trialbility, and (e) observability (Rogers, 2002). Jalota et al. (2015) provided an example where physicians teaching physicians can improve efficiency. Jalota et al. discovered that leveraging diffusion of innovations' relative advantage and compatibility can influence physicians' efficiency.

Greiver et al. (2011) considered an EMR technology system's interoperability as inefficient. However, physicians claim that an EMR technology system's prescription refill and consultation processing are considered an increase in efficiency. According to Greiver et al., an EMR technology system's efficiencies may not be assessed until after months of deployment. Kumar and Aldrich (2010) recognized that the decline in redundant medical records increased efficiency.

Accuracy. According to Jones et al. (2013), the adoption of an EMR technology system increased accuracy in billing. In order to recognize accuracy as a benefit of an EMR technology system, Denomme, Terry, Brown, Thind, and Stewart (2011) recommended data standardization. Furthermore, accuracy of an EMR technology system is one of the seven elements found in the Information Bill of Rights (Hiller et al., 2011). Ultimately an EMR technology system that delivers accurate data increases trustworthiness and adoption success (Khatri & Gupta, 2014). Buntin et al. (2011) stated that an important finding during their research they determined that human element play a critical role in an EMR technology system implementation.

Success

Cresswell et al. (2013) identified 10 critical indicators of a successful EMR technology system's implementation and adoption. The first indicator focused on the problem the system was expected to solve. Cresswell et al. continued to recommend establishing short-, medium-, and long-term metrics to help determine success. The next indicator involved the entire health care team, ensuring total buy-in on the EMR technology system's implementation and use. The remaining indicators identified by Cresswell et al. included the following items: considering options, selecting an affordable EMR technology system that meets clinical requirements, planning appropriately, keeping infrastructure in mind, establishing a plan to train staff, monitoring progress constantly, performing system's maintenance, and sustaining the system.

Spetz et al. (2012) identified the following four success factors after researching an IT implementation within a Veterans Administrative facility: (a) provide leader and staff support, (b) use of a flexible phase approach, (c) commit all required and necessary recourses, and (d) plan for setbacks and persevere. King et al. (2014) reported that the success of an EMR technology system is related to the adoption of its full-bodied format. Furthermore, meaningful use can play a critical role in the success of an EMR technology system.

Buntin et al. (2011) stated that an important finding during their research was that the human element plays a critical role in an EMR technology system's implementation. Moreover, health care leaders should emphasize more on physicians' perception and satisfaction during the adoption of an EMR technology system adoption (Chao et al.,

2013). Embracing physicians' participation during the EMR technology system adoption process can improve the rate of adoption in the U.S. (Nambisan et al., 2013).

The diffusion of innovation theory embodies the physicians' and other clinical staff's willingness to accept the adoption of an EMR technology system (Ancker et al., 2013). The staff's acceptance can spread throughout the entire organization increasing the probability of success (Cresswell & Sheikh, 2013). Greiver et al. (2011) recognized several attributes of diffusion of innovation theory that influence an EMR technology system, including: (a) relative advantage, (b) compatibility, (c) complexity, (d) observability, (e) reinvention, (f) organizational size, (g) organizational slack, (h) presence of champion, and (i) supportive leadership.

It is important to continue research on an EMR technology system's adoption to improve the nation's percentage of usage (Audet et al., 2014). Only half of the physicians participating in the research conducted by Audet et al. took advantage of electronic clinical data to treat patients. Furthermore, Audet et al. recommends future research to close the gap between adopters and non-adopters; by sharing knowledge and lesson learned from an EMR technology system's implementation.

Transition and Summary

Section 1 successfully identified the foundation of this study by addressing the following areas: (a) a paragraph introducing the background of the problem; (b) background of the problem; (c) problem statement; (d) purpose statement; (e) nature of study; (f) overarching research question; (g) interview questions; (h) conceptual

framework; (i) operational definitions; (j) assumptions, limitations, and delimitations; (k) significance of study; and (l) review of academic and professional literature.

Section 2 will include the restatement of the purpose statement, role of the researcher, participants, the research method and design, population and sampling, ethical research, data collection instruments, data collection technique, data organization technique, data analysis, reliability and validity, and transition and summary. Section 3 will include the overview of the study, the presentation of the findings, application to professional practice, implications for social change, recommendations for action, recommendations for further study, reflections, summary, and study conclusions.

Section 2: The Project

In this study, I focused on the benefits associated with the implementation of an EMR technology system. In Section 2, I reiterate the purpose statement, identify the role of the researcher, and describe the participants. I also present the research method and design, population and sampling, and ethical practices. Finally, I explain the data collection instruments, data collection technique, data organization technique, data analysis process, and reliability and validity of this study.

Purpose Statement

The purpose of this qualitative single case study was to explore strategies used by health care leaders in implementing an EMR technology system of meaningful use to take advantage of federal incentive payments. I selected six health care leaders from a military installation located in the Southeast United States. Results may contribute to increased knowledge of the social and financial benefits associated with the implementation of EMR technology systems of meaningful use, and hospitals could use the federal incentives to improve the health care services delivered to communities.

Role of the Researcher

Yin (2014) noted that a researcher is an individual responsible for developing and executing an academic study. My role as researcher included all logistical arrangements, ethical considerations, interview proceedings and protocols, observation proceedings, and data analyses. The use of interview protocols during qualitative research can assist in data collection (Jacob & Furgerson, 2012). Moreover, Jacob and Furgerson recommended the

use of interview protocol as a guideline for data collection to ensure consistency. Therefore, I used an interview protocol (Appendix A).

Since the beginning of the selected Emergency Department's (ED's) adoption of an EMR technology system, I have worked closely with project management and started 3 years of literature review. During the ED's transition to an EMR, I worked as a business process reengineer. My duties required shadowing all ED staff members and creating detailed mapping of all ED workflows.

A few disadvantages associated with case study interviews include insufficient interview questions, response bias, and imprecise recall (Yin, 2014). To mitigate these concerns, I utilized a sponsored signed overview demonstrating leadership endorsement. Chenail (2011) noted that research instrumentation rigor and bias administration play a critical role in qualitative research. To mitigate bias, I used a panel of subject-matter experts to validate open-ended interview questions. The panel members reviewed the interview questions for leading questions. In addition, I selected participants on a voluntarily basis. As the researcher, I ensured ethical practices, as outlined by the Belmont Report, including informed consent, participant confidentiality, and participant awareness of the option to withdraw without penalty. Respect for persons, beneficence, and justice are the three basic principles of the Belmont Report (Belmont Report, 1979). The Belmont Report provides a national guideline accepted throughout the research community (Greaney et al., 2012). Respect for persons encompasses acknowledgement and protection of autonomous and weakened autonomous persons' decision to participate

in a study (Belmont Report, 1979). Beneficence and justice mean doing no harm to the participants and treating everyone equally (Belmont Report, 1979).

Participants

Participants were health care leaders in an emergency room with at least 3 years of experience. Elo et al. (2014) stated that participants should embody the knowledge of the experience being explored. A health care leader can be defined as a medical doctor, physician assistant, or nurse practitioner. The health care leaders in my study were required to be present during the period of an EMR technology system adoption. Tufford and Newman (2012) noted that case studies include the collection of participants' real-world lived experiences. Health care leaders living the experience of the EMR technology system implementation constitute a single case study opportunity to learn from their experiences. Thomas and Magilvy (2011) observed that exploring a participant's experience may broaden the knowledge base.

Prior to collecting data, I obtained Walden University's IRB approval to conduct interviews and observations of six health care leaders within a military hospital. According to Chenail (2011), an IRB's approval is required before approaching participants. Williams (2011) stated that case studies involve interviews and observations, valid forms of data collection. To gain permission for access to health care leadership, I obtained a signed letter of cooperation (Appendix B). The letter of cooperation summarized the study's problem and purpose statement, research participants, and interview questions. After securing approval, I scheduled a kickoff meeting with emergency room leadership, who recommended participants. Participants received an

introductory e-mail explaining this study and confirming participation. Subsequent e-mail calendar invitations were sent to coordinate interviews. Good communication with the participants throughout the study contributed to a strong working relationship. Furthermore, my honesty and availability enhanced the working relationship. All participants volunteered, consented, maintained confidentiality, and received study withdrawal rights.

Research Method and Design

This study's overarching research question was the following: What are the strategies used by health care leaders to implement an EMR technology system of meaningful use to take advantage of the federal incentive payments? Yin (2014) stated that single case studies focus on individuals' real-world experience. I explored health care leaders' experiences regarding a transition from paper documentation to an EMR technology system.

Research Method

The three methods of research include qualitative, quantitative, and mixed-methods (Marshall, Cardon, Poddar, & Fontenot, 2013; Williams, 2011; Yin, 2014). A qualitative study affords the opportunity to analyze data through a collection of interview responses and observations. In qualitative research, the researcher collects textual data to describe individual experiences (Holloway & Biley, 2011; Williams, 2011; Yin, 2014). I chose qualitative methodology because it allowed me to explore a complex phenomenon (Marshall et al., 2013; Palinkas et al., 2013; Williams, 2011) and because it provided participants' perspectives regarding their experience.

Research Design

I selected a single case study design. A qualitative case study relies on a multitude of data collection tools for data analysis including (a) documentation, (b) interviews, (c) direct observations, (d) archival records, (e) participant observations, and (f) physical artifacts (Corley, 2011; Holloway & Biley, 2011; Yin, 2014). According to Williams (2011), there are three primary designs associated with qualitative research: (a) ethnography, (b) phenomenology, and (c) case study. The analysis of data gathered can be the most important and difficult part of a research study (Tracy, 2010; Williams, 2011; Yin, 2014). I gathered answers during interviews using open-ended questions to examine health care leaders' experiences during transition from paper documentation to an EMR technology system. A single case study focuses on an independent entity to explore a real-world problem (Tracy, 2010; Williams, 2011; Yin, 2014).

Previous literature demonstrated that a health care leader can influence the success of an EMR technology system. An ethnographic design was not used because of its long-term data collection requirement (Tracy, 2010; Williams, 2011; Yin, 2014). Additionally, a phenomenological design was not chosen because it focuses on individuals' lived experiences (Tracy, 2010; Williams, 2011; Yin, 2014).

I conducted interviews and observations because they constitute one of the most important aspects of a qualitative case study research design (Yin, 2014). Ishak and Bakar (2012) recognized interviews as a common data collection tool for qualitative studies. Furthermore, Chanail (2011) acknowledged that combining observations and interviews is a popular data collection mechanism. The six interviews were conducted in

face-to-face 20-minute sessions with audio recording using open-ended questions. The goal was to reach thematic/data saturation (Marshall et al., 2013). O'Reilly and Parker (2012) explained that thematic/data saturation occurs when there is no contribution of new information. In this study, interviews were conducted until they started to yield similar information.

Population and Sampling

I included interviews and observations of six health care leaders who experienced successful adoption of an EMR technology system. Determining sample size for qualitative studies differs from quantitative methods (Yin, 2014). According to Marshall et al. (2013), qualitative research lacks guidance for determining sampling size. Qualitative research relies on high-quality textual data from a small number of participants (Palinkas et al., 2013). Furthermore, Yin (2014) explained that qualitative case studies typically require at least six participants. According to Palinkas et al., a study's methodology can determine the number of participants. Marshall et al. stated that the number of participants directly affects data saturation. Moreover, combining interview and direct observation data collection techniques increases the rigor of the study (Thomas & Magilvy, 2011). My data collection continued until interviews returned no new information. Several researchers stressed the importance of data saturation to determine end state (Marshall et al., 2013; Palinkas et al., 2013; Yin, 2014).

It is important to select the correct sampling process, promoting the reliability of a study (O'Reilly & Parker, 2012; Palinkas et al., 2013; Sinkovics & Alfoldi, 2012). A popular sampling method used in qualitative studies is purposeful sampling (Elo et al.,

2014; Palinkas et al., 2013). Purposeful sampling can involve several methods including convenience, extreme, snowball, typical, and criterion (Elo et al., 2014; Palinkas et al., 2013). According to Palinkas et al. (2013), qualitative purposeful sampling is popular because study participants possess and share in-depth knowledge. I used purposeful criterion sampling to collect sufficient data for my study. According to Palinkas et al., criterion sampling is a popular sampling method in studies involving implementations. Furthermore, Palinkas et al. stated that criterion sampling requires participants to meet specific criteria. This sampling method fit my study well because the criteria for this study included health care leaders being present during the EMR technology system implementation.

Convenience sampling was not used because my study's sampling technique lacked a strategic approach (Palinkas et al., 2013). Researchers using convenience sampling can obtain participants from a gathering for convenience; however, this study required participants to meet certain criteria. I did not use extreme sampling because my study did not involve best and worst case scenarios. I did not use snowball sampling because the participants were known. Finally, I did not use typical sampling because there was no established/typical EMR technology system implementation.

Each participant experienced a transition from paper to EMR technology system documentation. This criterion narrowed the participant pool. After selection and coordination of interview protocol, interviews were conducted in a suitable conference room away from the participants' workplace. According to Yin (2014) researchers should provide an interview location that supports confidentiality, quietness, and a distraction-

free environment. Observations were conducted within the participants' workplace (emergency room).

Ethical Research

During a study, researchers are responsible for complying with ethical guidelines (Qu & Dumay, 2011). Before proceeding with collecting data, I received approval to conduct this study from Walden University's Internal Review Board (IRB). The IRB approval number was 07-13-16-0357859. Research organizations commonly rely on IRBs to ensure ethical guidelines and regulations are followed. Moreover, IRBs ensure thoroughness of the participant consent process (Greaney et al., 2012). In qualitative studies, the researcher is considered the only instrument for collecting data (Tracy, 2010). Before data collection began, I received Collaborative Institutional Training Initiative (CITI) certification. No incentives were offered for participating in this study.

Informed consent, required for all research involving interviews, involves the interview process, researcher's role, and data use (Qu & Dumay, 2011). Furthermore, Qu and Dumay noted that researchers should provide interviewees a brief description of the study, including potential risks, expectations, and rights. Prior to starting each interview, I read the consent form aloud and confirm the interviewee understands prior to asking the interviewee to sign the consent form.

Reenforcement was provided in reference to a participant's right to refuse to answer questions or withdraw from the study at any time. Furthermore, participants were informed that all data would remain confidential. An interviewer's responsibility includes

ensuring confidentiality and privacy (Qu & Dumay, 2011). I ensured confidentiality by identifying participants using codes (e.g., P1, P2, P3).

All data collected electronically and in hard copy form will be maintained in a secured area for 5 years. Electronic documentation will be password protected on a USB memory device. Hard copy documentation will be stored in a locked cabinet. After the 5 years elapse, data will be destroyed. According to Shaughnessy (2013), Health and Human Service regulations mandate a 3-year minimum requirement to retain data. Participants were not promised any incentives at any time during this study.

Data Collection

Data collection includes collection instruments, techniques, and organization techniques ultimately resulting in data analysis (Tufford & Newman, 2012). According to Yin (2014), data collection is a critical element of case studies. The data collection section includes the instruments, techniques, organization techniques, and my role as the primary data collection instrument.

Instruments

Throughout this qualitative single case study, I was the primary data collection instrument. According to Tufford and Newman (2012), a researcher is the instrument for data collection in qualitative studies. During this study, I relied on semistructured interviews and direct observations for data collection. Thomas and Magilvy (2011) mentioned that a researcher serves as an instrument to gather an in-depth knowledge of participants' experiences. Focusing on the health care leaders' perspectives of electronic medical records, justifies my selected approach.

Interview questions underwent review from a panel of subject matter experts, followed by quantitative data analysis of results to determine the best interview questions. Nevertheless, the interviews contained multiple open-ended questions, obliging valuable time of a health care leader. According to Anyan (2013), semistructured interviews afford an opportunity for interviewees to continue the conversation. The interview questions can be found in the semistructured interview protocol in Appendix A. I used an interview protocol to ensure interview process conformity (see Appendix A).

To heighten this study's reliability and validity, I utilized *member-checking*. The increased credibility occurs when participants review the interviews for accuracy (Sinkovics & Alfoldi, 2012). At the end of this study, participants received a courtesy copy of their transcribed interview results and research findings and key-stakeholders received a copy of the study's executive summary. Providing copies of interview results to participants and requesting participant feedback is known as *member-checking* (Goldblatt, Karnieli-Miller, & Neumann, 2011). Participants were requested to provide feedback on the accuracy of the transcription. According to Elo et al. (2014), *member-checking* can increase a study's trustworthiness.

Data Collection Technique

An audio recorder was used during the semistructured interviews. Recording of the answers to open-ended questions gathered the health care leaders' experiences of electronic medical records. Prior to the interviews, participants' consent was acquired and recording device tested. Special attention was given to ensure a consistent process when

collecting data. Upon receipt of IRB approval, I selected a few experts not affiliated with this study and consult with them about the quality and validity of the interview questions. I integrated their suggestions and feedback into my study to further revise my interview questions to obtain better quality answers, as suggested by (Yin, 2014).

I used semistructured interviews and direct observations to collect data for this study. Anyan (2013) found that interviews and observations represent the primary means for data collection during a qualitative study. The advantage of a semistructured interview is that it allows participants to share valuable information about their experiences (Elo et al., 2014). The benefit of direct versus participant observations results from the spontaneity of work environment observations (Yin, 2014). Elo et al. stated that a disadvantage of a semistructured interview is that it could allow a researcher to influence participants' answers. Furthermore, a copy of transcripts was provided to each participant to ensure accuracy. In a qualitative study, providing copies of transcripts, commonly known as *member checking*, represents an essential quality control measure because it affords participants an opportunity to confirm the truth of data collected during interviews (Harper & Cole, 2012). All data gathered from the direct observation was logged, secured, and analyzed.

Data Organization Technique

The research log, containing research codes assigned to participants along with participants' true identity, was documented in a password protected Microsoft® Excel spreadsheet. All interview transcripts, observation notes, and other supporting

documentation is stored and secured as internal documents in QSR*NVivo. Data analysis software similar to NVivo can improve organization of qualitative data (Yin, 2014).

Electronic documentation is password protected on a USB memory device. I maintained the only key of the locked cabinet storing hardcopy documentation and USB memory device. All data collected electronically and in the form of a hard copy is maintained in a secure area for 5 years. According to Coulehan and Wells (2005), the United States Department of Health and Human Services represents an organization that mandates a 3-year minimum requirement to retain research data. Walden University's policy stipulates a minimum of 5 years to retain data. After 5 years have elapsed, I will destroy all data.

Data Analysis Technique

A single case study evolves around single complex real-world events (Yin, 2014). This study is a qualitative study, collecting subjective data to analyze individual experiences of a real-world event. Some health care leaders lack strategies to implement an EMR technology of meaningful use to take advantage of the federal incentive payments. I collected data from multiple sources, including interviews and direct observations with six health care leaders within a military hospital.

The first analysis step, I collected data from twelve open-ended questions surrounding the study's overarching research question: What are the strategies used by health care leaders to implement an EMR technology system of meaningful use to take advantage of the federal incentive payments? Interviews can reveal personal experiences and lessons learned (Corley, 2011; Holloway & Biley, 2011; Yin, 2014). In this study, I

utilized three different types of data analysis: software analysis, coding and theme analysis, and inductive analysis. Furthermore, I used field research of past literature, interviews with health care leaders, notes from observations, and data triangulation of multiple sources of information. Yin stated that there are four types of triangulation, including (a) data triangulation, (b) investigator triangulation, (c) theory triangulation, and (d) methodological triangulation. I used a methodological triangulation method for my research study. According to Yin, methodological triangulation involves the use of multiple qualitative methods producing comprehensive data and providing confirmation of data. I used field research of past literature, interviews, and observations. Regarding observations, I observed participant's body language and the surrounding environment.

The second step includes my transcription of all interview recordings. I used QSR*NVivo version 10.0 software for transcription. Immediately after recording the interviews, transcription was accomplished to increase accuracy. Transcription of personal data and arbitrary data was not transcribed. Once data was transcribed, QSR*NVivo software was used to analyze the data. Importing the audio recordings of all interviews, playback speed can be easily repeated and controlled. Research software similar to NVivo can improve transcription of audio recordings (Basurto & Speer, 2012; Ishak & Bakar, 2012; Yin, 2014). During transcription, I coded each interview using QSR*NVivo software. Furthermore, I utilized QSR*NVivo software to establish themes and common data from the interviews. Open coding categorizes data collection from the interviews to compare and identify themes (Yin, 2014). Yin stated that axial coding

exposes relationships and themes for researchers to build selective coding to tell the story of the findings.

During this study, I used an inductive strategy to analyze the data. A ground-up analysis strategy can lead to valuable information (Yin, 2014). Results from the health care leaders' experiences on EMR technology system of meaningful use implementation may benefit the health care industry. According to Yin, during my inductive analysis, coding was assigned to keywords of interest. Moreover, I focused on key themes and how they aligned with past and present literature and with the conceptual framework of my study.

Reliability and Validity

Logical tests can determine the quality of a qualitative research study. The four traditional tests include: construct, internal, external validity, and reliability (Yin, 2014). According to O'Reilly and Parker (2012), there is no set of tests required for all qualitative research design approaches. The logic test used throughout this study includes: dependability, creditability, transferability, and confirm ability (Sinkovics & Alfoldi. 2012; Venkatesh, Brown, & Bala, 2013; Yin, 2014).

Reliability

Consistency and dependability are the qualitative equivalence to reliability found in quantitative research (Vankatesh et al., 2013). Furthermore, a reliable study should be repeatable with the same outcomes (Yin, 2014). During this study, I utilized member checking, transcript review, and expert panel review to ensure dependability. Quality control measures, including member checking, and transcript review, can ensure a more

accurate and unbiased study (Harper & Cole, 2012; Jacob & Furgerson, 2012; Yin, 2014).

According to Harper and Cole (2012), member checking can occur during the interviews or at the end of transcription. My strategy to accomplish member checking was to provide copies of transcripts to each interviewee, request feedback on accuracy, and verify that the transcription of the audio recordings match what the participants intended to say. For coding and theme review, I utilized QSR*NVivo version 10.0 software. I imported the audio recordings, allowing more playback control during analysis. QSR*NVivo software is a proven qualitative tool to auto code data and organize data (Ishak & Bakar, 2012; Sinkovics & Alfoldi, 2012; Yin, 2014).

Validity

I used data triangulation by combining multiple sources of information, field research of past literature, interviews, and observations of health care leaders. According to Yin (2014), triangulating multiple data sources strengthens the creditability of qualitative case studies. Other creditability measures I utilized include member checking and transcript review. Furthermore, my personal involvement during the organization's EMR technology system adoption increased creditability. Member checking strategies provide the creditability required for a trustworthy study (Elo et al., 2014; Thomas & Magilvy, 2011; Yin, 2014).

Transferability and confirmability represent other components of trustworthiness (Elo et al., 2014; Thomas & Magilvy, 2011; Yin, 2014). According to Thomas and Magilvy (2011), transferability can be achieved by explicitly describing participants. I

defined participants as health care leaders working in an emergency room. A health care leader can be defined as a medical doctor, physician assistant, or nurse practitioner. According to Thomas and Magilvy, my creditability, transferability, and dependability strategies lead to the study's confirmability.

I continued interviews until information gathered starts to return similar information, known as data saturation. Data saturation is an important subject relating to sample size of qualitative studies (Marshall et al., 2013). Furthermore, Marshall et al. (2013) stated that data saturation appears during data transcription and coding. Qualitative research data collection stresses the importance of data saturation to determine end-state (Marshall et al., 2013; Palinkas et al., 2013; Yin, 2014).

Transition and Summary

Section 2 presented a restatement of the purpose statement, role of the researcher, participants, the research method and design, population and sampling, ethical research, data collection instruments, data collection technique, data organization technique, data analysis, reliability and validity, and transition and summary. Section 3 will include the overview of the study, the presentation of the findings, application to professional practice, implications for social change, recommendations for action, recommendations for further study, reflections, summary, and study conclusion.

Section 3: Application to Professional Practice and Implications for Change

Introduction

The purpose of this qualitative single case study was to explore strategies used by health care leaders in implementing an EMR technology system of meaningful use to take advantage of federal incentive payments. I gathered data from various sources including interviews and observations of health care leaders from a military hospital. The findings indicated health care leaders' perceptions regarding the implementation of an EMR technology system, which may assist with future implementations to take advantage of federal incentive payments.

Presentation of the Findings

The overarching research question for this study was the following: What are the strategies used by health care leaders to implement EMR technology systems of meaningful use to take advantage of the federal incentive payments? All participants were present during the implementation of an EMR technology system. Participants' experience with use of an EMR technology system varied between 2 and 25 years. I used QSR*NVivo Version 10.0 software and an inductive strategy to analyze data from the interviews and identify themes. Additionally, I performed member checking to afford participants an opportunity to validate the accuracy of their responses during the interviews. Results from health care leaders' experiences regarding EMR technology system of meaningful use implementation may benefit the health care industry. During my inductive analysis, I assigned coding to keywords of interest (Yin, 2014). Moreover, I

focused on key themes (Table 1) and how they aligned with previous literature and with the conceptual framework of this study.

Table 1

Frequency of Themes From Interviews

Themes	Count	Percentage
System	50	4.09
Providers	42	3.44
Patient	20	1.64
Training	17	1.39
Champion	14	1.15

Theme 1: System

The system theme includes three topics: (a) system selection, (b) ease of use, and (c) interoperability. When selecting an EMR technology system, health care leaders should give several clinical and organizational considerations (Cresswell et al., 2013). Most participants stressed the importance of providers' early involvement in system selection (P1, P3, P4, P5, and P6). Shea and Belden (2016) recommended early onboarding of provider participation in EMR technology system implementation. Participant 1 suggested that the proper selection of the best EMR technology system could attract new providers. Furthermore, Participants 1 and 5 recommended testing multiple EMR technology systems prior to final selection.

Cresswell et al. (2013) stated that an EMR technology system should be easy to use and improve workflow efficiency. Participants 1, 3, and 5 mentioned that an EMR

technology system must be user friendly. Kellerman and Jones (2013) stated that ease of use satisfies patients and providers by improving safety. Additionally, Cresswell et al. indicated that an EMR technology system's ease of use and speed can impact acceptance. Cresswell et al. identified system interoperability as a critical factor associated with successful EMR technology system implementation. Participants 1 and 6 shared frustrations regarding the use of multiple systems to document patient care. The three topics covered within this theme can directly impact an organization's strategy to adopt an EMR technology system of meaningful use.

Interoperability is one of many associated mandates of meaningful use (Botta & Cutler (2014). Hochron and Goldberg (2014) acknowledged the importance of managing health care leaders' role during an EMR technology system adoption. Improper management could result in postponement of successful meaningful use. Additionally, Mostashari (2012) recognized the importance of collaboration between providers and EMR technology system vendors, ensuring meaningful use compliance. Organizational leaders' knowledge and use of diffusion of innovation theory could help guarantee a successful EMR technology system adoption.

Diffusion is defined as a distinct communication process to accept change (Rogers, 2002). Involving health care leaders at the onset of EMR technology system selection can improve diffusion. According to Rogers (2002), communication through all channels is part of the diffusion of innovation theory process. Furthermore, Rogers identified the following five different classifications of an individual's willingness to adopt new ideas: (a) innovators, (b) early adopters, (c) early majority, (d) late majority,

and (e) laggards. Ease of use could convince late majority or laggards. Rogers stated that the EMR technology system complexity directly affects the adoption rate.

Theme 2: Providers

The providers theme included three topics: (a) buy in, (b) provider involvement, and (c) what is in it for me. Participants 1, 5, and 6 expressed the significance of provider buy in for a successful EMR technology system adoption. Participant 6 further explained the importance of provider buy in to assist in convincing laggards. Cresswell et al. (2013) expanded the requirement for buy in throughout the entire health care workforce. Shea and Belden (2016) acknowledged that providers' involvement during the implementation of an EMR technology system could assist in achieving buy in. Participants 2, 3, and 4 mentioned that they used peer-to-peer training and sharing of best business practices. Farzianpour et al. (2015) identified lack of providers' involvement as a barrier to accepting an EMR technology system. All participants stated that during implementation, provider involvement and input played a critical role. Furthermore, providers rely on the EMR technology system. Participant 1 stated that when the EMR technology system is down, providers complain.

Being able to demonstrate what is in it for me can positively impact early adoption. All participants agreed that provider involvement assisted in communicating the EMR technology system benefits to other providers. The findings related to this theme can be linked to the support of meaningful use. This theme's alignment with meaningful use focuses on providers' use of the EMR technology system. According to Botta and Cutler (2014), for private practices and other health care organizations to

receive federal incentives, providers must adopt and use an EMR technology system. Without providers' buy in and involvement, health care leaders may never be able to obtain meaningful use. Health care leaders can use diffusion of innovation theory to assist in the effective adoption of an EMR technology system.

Diffusion of innovation theory contains five adopter levels: (a) innovators, (b) early adopters, (c) early majority, (d) late majority, and (e) laggards (Rogers, 2002). The earlier that health care leaders require provider involvement and buy in, the greater the likelihood of success. Additionally, Rogers (2002) identified that communication of new ideas across a social community constitutes diffusion of innovation. Innovators and early adopters can communicate the benefits and demonstrate what is in it for me to increase buy in.

Theme 3: Patient

The patient theme included two topics: (a) efficiency and (b) safety. All participants voiced concerns regarding how the EMR technology system affects the speed of patient care. The combination of downsizing and overcrowded emergency departments represents a major health concern in the United States (Ben-Assuli et al., 2012). Furthermore, Ben-Assuli et al. (2012) identified left without being seen (LWBS) as an emergency departments metric of efficiency. Participant 4 reported a 2% decrease in LWBS since adoption of an EMR technology system. Participant 6 reported use of electronic templates; however, without review and correction of preprinted templates, errors in documentation occurred. Participant 1 reported that the use of dictation software contributed to the success of adoption. Using templates and dictation may lead to

efficient practices; however, previous studies indicated that required corrections negate time saved (dela Cruz et al., 2014).

Participant 1 was observed using electronic patient status dashboards. Participants 1 and 5 stated that dashboards can be used to alert staff on patients' status, improving patient flow and safety. Ben-Assuli et al. (2012) noted that EMR technology system alerts should be included, informing the health care team on patient status to improve quality and safety. Participant 3 identified legibility as the primary purpose for transition from paper to electronic documentation. Participant 6 stated that documentation on paper prevents other providers from determining previous medical care. Participant 6 also shared a story of how documentation in an EMR technology system helped in a patient's continuity of care. Participant 2 mentioned that communication has improved since transition from paper to an EMR technology system. The findings related to this theme support the purpose of the HITECH Act and meaningful use.

Safety and efficiency are two of the three expected improvements outlined in the HITECH Act of 2009 (Alder-Milstein et al., 2014). Alder-Milstein et al. stated that the federal incentives to encourage providers' use of EMR technology systems support meaningful use. The EMR technology system adoption and use of dashboards can contribute to ensuring patient safety and workflow efficiencies. The EMR technology system's effect on patient safety and efficiency benefits can be diffused throughout an organization prior to adoption.

Diffusion of innovation theory can be associated with the theory of social contagion (Gan & Cao, 2014). Gan and Cao (2014) identified social contagion theory as a

means of spreading the communication of new ideas. As one adopter accepts the use of an EMR technology system, peer-to-peer communication spreads the infection of adoption. Furthermore, patient safety and efficient workflows are relative advantages of an EMR technology system. Rogers (2002) identified relative advantage as a feature establishing the rate of innovation. Combining the diffusion of a contagious realization of relative advantages could increase the rate of innovation.

Theme 4: Training

The training theme included two topics: (a) modes and (b) peer to peer. Cresswell et al. (2013) identified training as a critical milestone for a successful EMR technology system implementation. Participant 4 stated that more time should be spent on training. Participants 1, 3, 4, and 6 thought the training offered in a variety of modes (e.g., over shoulder, classroom, and role based) was satisfactory. However, Participants 2 and 5 expressed dissatisfaction with the training and relied on self-teaching or peers for additional training. Experts consider hands-on training a more effective choice than classroom training (Multak, Khazraee, Rogers, & Dalrymple, 2013). Additionally, Cresswell et al. mentioned the importance of role-based and hands-on training.

Shea and Belden (2016) mentioned that the use of peer-to-peer training influences best business practices and adoption. Participants 2, 3, and 4 agreed that a contributing factor of success resulted from peer-to-peer training. The relationship between training and meaningful use depends on the initial and continued use of an EMR technology system. Previous studies indicated that a barrier of meaningful use of an EMR technology system is a provider's age (Botta & Cutler, 2014). Utilizing peer-to-peer and different

modes of training may customize the training to accommodate special needs. Botta and Cutler recommended that nursing staff accompany older providers, another form of colleague-to-colleague training. Employing these strategies may contribute to achieving the ultimate goal of reaching meaningful use.

The two concepts associated with my conceptual framework were relative advantage and complexity. During training, the relative advantages of using peer-to-peer communication in a new EMR technology system may influence the late majority adopters and laggards. Relative advantage requires the ability to convince providers that the change is better than the current process (Rogers, 2002). Furthermore, different modes of training can help mitigate the EMR technology system's complexity. Rogers defined complexity as the perception of ease of use.

Theme 5: Champion

The champion theme related to the importance of champions during implementation. Shea and Belden (2016) described a champion as a facilitator who provided support and enthusiasm during implementation. All participants agreed that champions play a critical role in successful EMR technology system implementation. Furthermore, Participant 3 mentioned that champions should be involved in all aspects of an EMR technology system adoption. Participants 5 and 6 mentioned that during implementation, champions created user guides and were always available. Additionally, Participant 4 suggested that listing champions could help identify and communicate their availability. A web-based (i.e., SharePoint) listing of champions may be created to display information for quick reference. Shea and Belden suggested bringing champions

in at the beginning of implementation to aid in the communication of change. Participant 3 explained the importance of having champions communicate the EMR technology system's benefits to everyone. Deploying champions could assist in the diffusion of change.

Diffusion of innovation theory includes the ability to communicate a new idea across a social community in a timely manner (Rogers, 2002). Champions can contribute to the pollination of an EMR technology system adoption. Gagnon et al. (2014) determined that champions tend to improve providers' acceptance. Furthermore, Gagnon et al. recommended the recruitment of champions should include well-respected providers. Champions serve as role models for other providers, encouraging peers to accept meaningful use (Leung, 2012). Involving champions at the onset and recruiting well-respected providers may inspire continued use of an EMR technology system. Furthermore, champions may assist health care leaders during transitions between levels of meaningful use.

Application to Professional Practice

The findings of this study include applicable solutions for health care leaders to resolve business problems. I found four themes in this study pertaining to professional practice, including (a) system, (b) provider, (c) training, and (d) champion. Each theme may contribute by enhancing health care leaders' knowledge of strategies used to adopt an EMR technology system of meaningful use successfully. Adopting an EMR technology system is a costly and important endeavor (Nambisan, 2014). EMR technology system selection may prove to be a critical step in a successful adoption. The

correct selection of an EMR technology system may attract new employees or retain current staffing. Including providers' participation in system selection may improve the likelihood of a successful implementation. Furthermore, other factors of a successful adoption include interoperability and ease of use (Kellermann & Jones, 2013). Botta and Cutler (2014) identified interoperability as a key element of meaningful use for health care organizations to receive federal incentives.

Nambisan (2014) explained the importance of peer-to-peer interactions. During system selection, the use of peer-to-peer communication and participation in vendor demonstration of multiple systems may assist in system selection. Nambisan mentioned that peer-to-peer communication about adoption of complex EMR technology systems improve the rate of adoption. Additionally, involving providers early and throughout the entire EMR technology system implementation is extremely important to the success of the implementation (Shea & Belden, 2016). Finally, the finding related to how buy-in may play an important role in a successful adoption and use of an EMR technology system is crucial.

The findings of this study emphasize the importance that training has in assisting health care leaders during an EMR technology system adoption. Cresswell et al. (2013) mentioned the significance of training, combining different modes, including hands-on, role-based, and workflow specific. Furthermore, this study highlighted the importance that a clinical champion can play in the success of an EMR technology system adoption. Champions' skillsets can vary amongst the roles of health care and assist in the training of other staff (Shea & Belden, 2016).

Implications for Social Change

This study's implications for social change are applicable to patients and health care industry leaders, increasing the knowledge of health care leaders' perceptions of EMR technology system implementation. Implementation of an EMR technology system of meaningful use might improve patient safety, continuity of care, and efficiency. These findings are consistent with current research, as the expected outcomes for an EMR technology system include the following improvements: (a) quality of care, (b) communication, (c) patient safety, (d) accuracy, and (e) efficiency (Jawhari, Ludwick, Keenan, Zakus, & Hayward, 2016). Health care leaders may use the results of this study to improve the adoption of an EMR technology system of meaningful throughout our nation, improving the delivery of safe and quality care.

This study's implications for positive social change include the potential to influence leaders of health care organizations to understand the way health care leaders' perceptions of an EMR technology system could affect patient safety. Tanner, Gans, White, Nath, and Pohl (2015) recognized previous literature uncertainties of an EMR technology systems' effect on patient safety. However, Tanner et al. verified the positive influence an EMR technology system has on patient safety, including the (a) use of dashboards, (b) alerts and, (c) improvements in legibility. Tanner et al. explained that an EMR technology system alerts assist providers in improving patient safety.

In addition, this study's implications for positive social change include the potential to influence leaders of health care organizations to understand the way health care leaders' perceptions of an EMR technology system could affect continuity of care.

Rinner et al. (2016) defined continuity of care as the ability of health care providers to communicate previous patients' care. Rinner et al. stated that the use of an EMR technology system positively affects continuity of care of chronically ill patients. The improvement in communication of an EMR technology system improves continuity of care by encouraging the adoption of an EMR technology system of meaningful use.

Furthermore, this study's implications for positive social change include the potential to influence leaders of health care organizations to understand the way health care leaders' perceptions of an EMR technology system could affect health care efficiency. An expected outcome of an EMR technology system of meaningful use is efficiency. Furthermore, the HITECH act of 2009 defines efficiency as one of the primary criteria elements of meaningful use (Alder-Milstein et al., 2014). Wolf et al. (2012) stated that federal legislation, through meaningful use, promotes efficiency through the use of an EMR technology system. The efficiency improvement example found in this study includes the decrease in emergency departments' LWBS, which contributed to the EMR technology system adoption and implementation. Improved metrics similar to LWBS could provide social change for the health care industry and society.

Recommendations for Action

Four of the five themes (i.e., system, provider, training, and champion) from this study may contribute to health care leaders' ability in addressing the reluctance to, and resistance of, adopting an EMR technology system adoption of meaningful use. By 2020, health care organizations must demonstrate meaningful use to receive federal incentives

(Botta & Cutler, 2014). Goldsack and Robinson (2014) stated that health care organizations obligated millions of dollars to achieve meaningful use. Moreover, the Federal Government anticipates issuing over $30 billion in incentives to health care organizations exhibiting meaningful use (Agha, 2014). To assist health care leaders with the development of strategies to adopt an EMR technology system of meaningful use, I offer the following recommendations for action: (a) provider involvement, (b) system selection, (c) earn buy in, (d) hands-on demonstration, (e) increased planning and training, (f) use of champions, and (g) people-centricity.

First, I recommend involving providers in all phases of an EMR technology system adoption and implementation. Involving providers early and throughout the entire EMR technology system of meaningful use adoption and implementation is extremely imperative to the success of the adoption (Shea & Belden, 2016). Secondly, I recommend ensuring provider participation in system selection confirming interoperability, ease of use, and meaningful use and identifying key factors in a successful adoption and implementation. Moreover, I recommend an emphasis on earning buy-in before adoption and implementation for a successful transition to the use of an EMR technology system. The next recommendation occurs during system selection, considering the use of providers during hands-on vendor demonstration of multiple systems before selection. I endorse Cresswell et al.'s (2013) findings, including the recommendation to use a hands-on training mode. Another recommendation includes spending more time on planning and training, allowing ample time for identification and employment of early adopters to improve success. According to Cresswell et al. (2013), training should be approximately

40% of the implementation budget. Furthermore, I recommend that health care leaders recruit and empower champions to communicate change and provide peer-to-peer coaching. Finally, the most significant recommendation is that I encourage health care leaders to utilize a people-centric approach to the adoption of an EMR technology system of meaningful use. In conclusion, I plan to circulate the results of this study by publishing in scholarly journals and other forms of white papers. Furthermore, I will present the findings during health information technology conferences.

Recommendations for Further Study

Further research is uncovered in the limitations of this study. Future researchers could duplicate efforts found in this study. However, I would recommend interviewing a larger sample of participants closer to the post-implementation phase. Using this strategy may improve the total number of participants and participants' recollection of events. An additional recommendation for further research may consider reconnecting the human element into all phases of the adoption of an EMR technology system of meaningful use. Multiple participants identified the importance of provider participation and use of champions. Future researchers may conduct research on different recruitment strategies of champions. Furthermore, future researchers may conduct an experiment comparing one implementation with to one without the use of champions.

The final recommendation for further research is referencing voice recognition software and template use in an EMR technology system of meaningful use. Further research could include exploration on the efficiency, accuracy, and potential problems associated with the use of voice recognition software and templates. Some participants

identified concerns related to potential errors in documentation found in electronic templates and dictation from voice recognition software. Future researchers could conduct a quantitative study on the effect of dictation and templates on patient safety. Finally, researchers could explore documentation quality improvements caused by voice recognition software.

Reflections

After 4 years of attending Walden University, my appreciation of the intense undertaking of research is astounding. My journey heightened my awareness on the attention to detail required for conducting qualitative research. The challenges I faced included the completion of my proposal, conducting an oral defense, and receiving IRB approval. Furthermore, I learned that hard work and perseverance result in great rewards. During my nine years as an informatics specialist, I learned to appreciate the human element involved in an EMR technology system adoption. Moreover, I learned that an EMR technology system implementation is not just another project with milestones; the implementation also affects people. I learned to listen and appreciate the voice of the customer and business during an EMR technology system adoption.

Summary and Study Conclusion

The Federal government's objective was to achieve 100% adoption of an EMR technology system of meaningful use (Charles, 2013). Researchers continue to look into the reason for the slow adoption, despite the benefits of an EMR technology system (Gan & Cao, 2014). However, concentrating further research on a people-centric approach may fulfill the health care leaders' gap of knowledge to achieve the Federal Government's

objective. Listening to the voice of the customer and business may improve the rate of a successful adoption and meaningful use of an EMR technology system. The five themes identified in my study (i.e., system, patient, provider, training, and champion) may apply to social change and professional practices. I investigated the importance of providers' involvement in an EMR technology system of meaningful use selection. Furthermore, I examined the significance of providers' early participation in an EMR technology system adoption. Finally, I discovered the importance of a champion, which has to do with assisting health care leaders in diffusing the adoption of an EMR technology system of meaningful use.

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Appendix A: Interview Protocol

INTERVIEW PROTOCOL

OPENING STATEMENT:

- Hello, I am Joseph B. Weagraff and I want to thank you for participating in my study.
- Prior to starting the questions, I would like ensure you are aware of your rights.

Transition into the consent process

CONSENT PROCESS:

- Prior to starting the interview, I would like to read the consent aloud and confirm your understanding prior to asking you to sign the consent form.

*** Have participant sign consent ***

(Prior to the interviews, participants' consent will be acquired (provide a copy to participant) and recording device will be tested.)

TARGETED CONCEPT QUESTIONS:

1. How many months/years experience do you have using an EMR technology system?
2. What is your role in the emergency room and what was your involvement in the EMR technology system implementation?
3. Do you consider yourself a super-user/clinical champion?
4. What impact does an EMR technology system have on the efficiency of an emergency room?
5. How important is a super-user/clinical champion in the implementation of an EMR technology system?
6. How can providers be utilized to improve the implementation/sustainment of an EMR technology system?
7. How does an EMR technology system affect the emergency room workflow?
8. What do you consider the advantages of using an EMR technology system?
9. What do you consider the disadvantages of using an EMR technology system?
10. What are your experiences of the EMR technology system implementation?
11. What are your experiences of the EMR technology system training conducted?
12. If you were to go back in time, what would you have done differently during the implementation of the EMR technology system?

TARGETED FOLLOW UP QUESTIONS:

None at this time.

CLOSING STATEMENT:

- All data collected electronically and in the form of a hard copy will be maintained in a secured area for 5 years.
- Electronic documentation will be password protected on a USB memory device.
- Hardcopy documentation will be stored in a locked cabinet.
- After the 5 years elapse, data will be destroyed.
- At the end of the interview, after transcription you will receive a courtesy copy for your review / feedback.

- Thank you very much for your time and have a wonderful day.

Appendix B: Letter of Cooperation

Letter of Cooperation

TBD

Dear Joseph B. Weagraff,

Based on my review of your research proposal, I give permission for you to conduct the study entitled Provider's Experiences of Electronic Medical Record Adoption and Use within my hospital. As part of this study, I authorize you to conduct all logistical arrangements, ethical considerations, interview proceedings and protocols, observation proceedings, recruitment, data collection, member checking, results dissemination activities and data analyses. Individuals' participation will be voluntary and at their own discretion.

We understand that our organization's responsibilities include: provide access to all participants meeting the study's criteria, rooms, resources, and supervision that the partner will provide. We reserve the right to withdraw from the study at any time if our circumstances change.

The student will be responsible for complying with our site's research policies and requirements, including approval of the hospital's Scientific Review Committee and/or International Review Board.

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,

Walden University policy on electronic signatures: An electronic signature is just as valid as a written signature as long as both parties have agreed to conduct the transaction electronically. Electronic signatures are regulated by the Uniform Electronic Transactions Act. Electronic signatures are only valid when the signer is either (a) the sender of the email, or (b) copied on the email containing the signed document. Legally an "electronic signature" can be the person's typed name, their email address, or any other identifying marker. Walden University staff verify any electronic signatures that do not originate from a password-protected source (i.e., an email address officially on file with Walden).