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Health Care Team Members' Perceptions of Changes to an Electronic Documentation System

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This is to certify that the doctoral dissertation by

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Abstract

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MS, University of North Dakota, 2008

BS, Regis University, 2004

Dissertation Submitted in Partial Fulfillment

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Abstract

Policy makers view electronic medical records as a way of increasing efficiency in the U.S. health care system. However, hospital administrators may not have the clinical background to choose a documentation system that helps the health care team safely increase efficiency. The purpose of this case study was to examine health care team members' attitudes and perceptions of quality of care and efficiency amid a documentation system change. The theory of change was the theoretical foundation for the study. The 6 research questions were designed to elicit information about what the health care team experienced when a documentation system changed and how the change affected health care workers' stress level, chance of medical errors, ability to deliver quality care, and attitudes about hospital efficiency. Semi-structured interviews were conducted with the 15 members of a health care team who volunteered from the group and met the inclusion criteria for the study (i.e., employed during the documentation system change). The participants represented all aspects of the health care team to create a bounded case. The interview responses were hand coded to find common themes among the participants. Most participants revealed that the implementation of the new system increased their efficiency and the quality of care they offered to patients. Participants felt that the training and implementation of the system was inadequate and not specific enough for their group. By providing health care administrators with more information about the health care teams' perceptions during a change in documentation systems, they may be able to improve implementation of a new system, creating more sustainable change with less negative impact.

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Dedication

This dissertation is dedicated to my wonderful daughter, Sydney.

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I would like to thank all of my family and friends for helping me get through this. I would also like to thank Dr. Jacquie Fraser and Dr. Suzanne Richins for their support and guidance.

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Chapter 1: Introduction to the Study

The U.S. health care system is changing, and health care efficiency is more important than ever. Government, insurance, and hospital administration are demanding that hospitals and providers be more efficient with the money paid to them. However, there exisits a lack of understanding by government and administration bodies about what constitutes hospital efficiency (Ancarani, Mauro, & Giammanco, 2009). For example, financially, several researchers have found that higher health care costs do not equate to better patient outcomes (Bach, 2010; Bhattacherjee, 2004; RAND Study, 2013). Thus, many changes that health care administrators make appear to add more work for providers without a direct patient benefit. These changes subsequently take time away from patients and utilizing more resources while not significantly achieving better patient outcomes (Wang, 2012). At the same time other work suggests that simultaneous promotion of care coordination and stronger policy development may be a way to achieve higher efficiency and, subsequently, lower costs, better patient outcomes, increased patient satisfaction, and shorter wait times and hospital stays (Bhalla & Kalkut, 2010). Electronic medical records (EMR) could help to improve efficiency and health care but could also increase work for the health care team.

To attempt to achieve greater efficiency, many hospitals and clinics in the U.S. have implemented EMR systems (e.g., EPICS, Meditech, and T-System). These are examples of some of the popular systems being utilized by hospital systems. However, there is little evidence as to actual benefit of these systems on operations (Gastaldi et al., 2012). Also, researchers have not examined whether a change in an existing system

affects health care teams or their perceptions of regarding the likelihood that a change in EMR systems would increase or decrease their efficiency (Sillow-Carrol, 2012). Thus, research as to the effects of these changes on providers and staff should be conducted to measure and explore the perceived usefulness, discomfort, intention and attitude of the health care team compared to their potential benefits to health care staff, patients and hospitals (Bhattacherjee, 2004). I hope to contribute knowledge that can aide health administrators, health care workers, and system designers create, implement and adopt an EMR.

The potential implications that will result from this study that will result in positive social change are that the results could create more awareness about how a change actually affects those that are using the system. The more knowledge regarding EMR and how those who are actually using it will help create better systems, implementations, and adoptions. Both of these aspects could lead to less frustrated health care team members which would lead to better patient care.

In this chapter the background, problem statement and purpose of this study is explained. The research questions for this study are introduced below. This study was guided by the theory of change and was a qualitative case study. The limitations, assumptions, and definitions are also outlined in this chapter.

Background

Documentation systems are now a very important part of current medical practice (Wang, 2012). By using EMR, providers are able to document more patient information and track data such as wait times, vital signs, medication, and treatments (Blacksburg,

Ghafar, Green, Duman & Rosenzwig, 2013). Documentation is extremely important in healthcare for continuation of care, decreasing liability, and recording medical data (Healthy People 2020, 2014). They are major indicators of health care quality (Helton, 2011).

A fully functioning EMR system has the potential to improve health care quality and safety and improve the public health information infrastructure. A good EMR system that is fully adopted can help facilitate clinic and consumer decision-making and build health skills and knowledge (Healthy People 2020, 2014). Due to the importance and potential impact of EMR, researchers have examined patient outcomes, hospital efficiency, cost, and patient information security (Illing & Burger, 2014). However, the satisfaction of the health care staff (e.g., physicians, midlevel providers, nurses, medical assistants, social workers, unit secretaries, and office workers) who use these systems has not been adequately examined. Little work has been done in this area even as hospitals implement EMR to improve efficiency and meet federal requirements (Wang, 2012). The gap in literature shows a lack of understanding about how those who actually use the EMR system on a daily basis. Understanding their perception about how a change in EMR systems effects their ability to do their job could offer keys to better systems, implementation and adoption that could lead to better health care.

I believe that it is imperative to understand how primary documentation system users (i.e., primary care givers) are affected by the implementation of these systems. A full understanding about how the primary users feel a system change effects their ability to their job safely, efficiently, and happily is a very important public health issue because

if health care workers cannot do their jobs, it will affect the health care system. Health communication and health information technology is listed as an objective of Healthy People 2020. "Health communication and health information technology are central to health care, public health, and the way our society views health" (Healthy People 2020, 2014, para. 2). The purpose of this study was to gain a deeper understanding of the possible effects of a documentation system change on health care workers. Gaining knowledge about this could help to prevent medical errors, health care worker burn out, decreased efficiency, and help to create a better environment for the health care team and patients.

Problem Statement

Health care decision makers are facing pressure to operate more efficiently (Friedberg et al., 2014). However, the effect of these changes on the satisfaction and efficiency of health care team members have not been sufficiently researched. EMR are one of the most promising solutions to the challenges that are facing the health care field (Gastaldi, Lettieri, Corso & Masella, 2012). However, the adoption of this technology has led to many concerns by users who have less than expected results after implementation (Gastaldi et al., 2012).

There are many concerns with implementing EMR. One of the greatest challenges that users of EMR face is that is there is a lack of knowledge by implementers about how to explain successful use of the technology (Gastaldi et al., 2012). One of the biggest causes of dissatisfaction of health care workers is EMR (Friedberg et al., 2014). Health care team satisfaction, especially physician satisfaction, is a public health concern

because dissatisfied providers and staff lead to poor decision making, dissatisfied and noncompliant patients, poor continuity of care, and substandard medical care (Zuger, 2004). After an EMR is implemented, the positive results, such as cost savings, error reduction and increased efficiency, are often less than expected (Gastaldi et al., 2012).

EMR is becoming a more important research topic. While there is a significant body of literature examining the effect of EMR on patient outcomes, there is a significant literature gap concerning the possible effects of documentation system change on health care team members (Ancarani et al., 2009). Very little is known about how the method of introduction and implementation of the EMR system affects its success (Gastaldi et al., 2012). There still remains minimal research regarding processes for effectively implement EMR systems (Schierhout et al., 2013). There are few studies on strategies for transitioning an EMR system (Bentley et al., 2014). During my literature search, I found very little research on the transition or policies surrounding the EMR system transition.

The promotion of good policy development and a good transition to a new EMR is one way to achieve higher efficiency. Having a well-considered EMR system documentation policy should be a top priority for administrators and policy makers (Bentley et al., 2014). Such a policy could be one of the key means of making U.S. hospitals more cost-effective and efficient while increasing provider, and subsequently patient satisfaction (Bhalla & Kalkut, 2010). Currently, some hospitals do not adequately analyze or support the changes that are required to realize the full benefits of an EMR system (Gastaldi et al. 2012). To have a more successful EMR implementation or

change, it is suggested that administrators focus beyond the technology itself and place hospital emphasis on patient results, thereby reducing the resistance of the health care team to a given change (Bentley et al., 2014).

Purpose of the Study

The purpose of this case study was to examine a health care team's attitudes and perceptions of quality of care and efficiency in the context of changes to its documentation system. Health care providers are very reluctant to use EMR systems due to poor usability (i.e., layout, available data fields, system requirements), time-consuming data entry, interference with face-to-face patient care, inability to exchange health information between EMR products, and degradation of clinical documentation (Sillow-Carrol, 2012). This reluctance contributes to professional dissatisfaction (Friedberg et al., 2013). The poor usability, degradation of clinical documentation, and time-consuming data entry matches my own personal clinical experiences and observations at multiple hospitals and clinics. After a documentation system change at my work, I noticed how easy it was to enter the data incorrectly. With the new system, my frustration increased due to the additional time it took to document patient encounters. Through this research it was possible to show that there is a significant impact on the health care providers' and the health care team's perceptions of the new system due to how it was implemented.

Research Questions

My investigation sought to answer six research questions:

RQ1. What does a health care team experience when a documentation system changes?

RQ2. How does a documentation system change affect health care workers' stress level, chance of medical errors, and provision of quality care?

RQ3. Does a documentation system change affect users' attitudes about hospital efficiency?

RQ4. Does a documentation system change affect users' attitudes about patient outcomes?

RQ5. How does a documentation system change affect users' attitudes about the quality of care they provide?

RQ6. How does the way the system is implemented affect the team's acceptance of the system?

Theoretical Foundation

The theory of change ([ToC]; Center for Theory of Change, 2015) served as the theoretical foundation for this study. The ToC is a theory in which a social outcome of a policy or an activity can be predicted based on well considered steps outlined prior to implementation of a policy, technology, social program or other societal activity (Taplin & Clark, 2012). In the mid-1990s the ToC emerged after Austin and Bartnek, two industrial-organizational psychologists, noted approaches to change and gathered many theorists in a round table discussion (Center for Theory of Change, 2015). In the study

presented herein, I used a reverse ToC lens on the study group to examine what steps were recommended to get a desired change. In the reverse ToC lens, if one knows a specific outcome, such as a successful EMR system implementation, one can backtrack along its implementation to see the steps, motivations and personnel responses that lead to the observed outcome, even if one does not know the exact steps. Usage of the ToC is increasing among professional groups wanting to create successful change (Center for Theory of Change, 2015). In the ToC, successful building blocks to create a long-term successful change, which are defined, to help create a road map for a group to achieve a common goal (Center for Theory of Change, 2015).

The ToC is a theory with a rigorous participatory process. All stakeholders must clearly articulate their desired outcomes, the interventions needed to get there, and the indicators of success (Taplin & Clark, 2012). The process includes using mapping or a building block process that (a) identifies long-term goals, (b) maps the process backwards to work out requirements and interventions to achieve the goals, (c) identifies assumptions that exist and articulates rational for why the outcomes are necessary, (d) finds the best strategic interventions to achieve the desired outcome, (e) develops clear indicators of success, (f) has a quality review after that ensures plausibility, feasibility, and testability of outcomes, and (g) has a written narrative to summarize the logic of the plan (Taplin & Clark, 2012). Leaders of groups use the ToC in many circumstances; most applicable to this study is when there needs to be team building or collaboration, revisions of plans, evaluation, or to influence policy makers (Center for Theory of Change, 2015). The ToC is a very good guide to clearly find out what steps are needed to

obtain a better stakeholder consensus and engagement in the development and change process (University of South Florida, 2009). From my experience, I have observed that when a EMR is implemented or changed, many users feel a lack of empowerment and lack of knowledge about why the system is changing or how success will be measured.

When the ToC is applied, it helps to combine the goals of stakeholders and decision makers to make clear ideas, a plan to accomplish the change, and specific expectations (The University of South Florida, 2009). The ToC is the why and how a change works (DeSilva et al., 2014). The ToC has recently gained popularity for use as a theoretical framework for organizations making change because of its building block method which leads to successful implementation (Kail, 2012). One of the biggest benefits to utilization of the ToC is that it can be used to bring together a range of stakeholders and create a unified method to achieve well defined goals as well as a clear way to measure effectiveness of the change (DeSilva et al., 2014). The ToC can be utilized as a guide for organizational leaders to turn ideas into strategies to create a tangible approach to change (The University of South Florida, 2009). Additionally, utilizing the ToC constructs helps to create an ongoing process of reflection to explore change, evaluate the change, and why it happens (DeSilva et al. 2014). For this study the ToC framework was utilized to help guide the development of the interview questions and the analysis.

Utilization of the ToC can lead to well adopted and sustainable change. The theory can be used to help organizations define small, clear, and simple steps to successfully complete the change desired (Kail, 2012). Change guided by the utilization

of the ToC can increase the likelihood that the intervention will be effective, sustainable and scalable because it helps to turn complex interventions into simple steps that integrate every member and can be quantitatively evaluated (DeSilva, 2014). On a broader scale, changes made by organizations utilizing the ToC tend to be more sustainable and successful than those plans not made with this theoretical framework (The University of South Florida, 2009). Using the ToC can also help to define who is being influenced; what benefits the change will achieve; the time period of achieving desired change and results; the steps needed to make change; the necessary resources; the context in which the change will occur; and the assumptions that will need to be made (Forti, 2012). The ToC principles can be applied by policy makers, administrators, program implementers and throughout all levels of a medical practice to create a plan for a successful change (The University of South Florida, 2009).

Change guided by the steps of this theory can help ensure that the correct goals intended by the implementers are being achieved and that the actions to achieve this goal are aligned and offer a way to measure the impact (Kail, 2012). ToC is applicable to this study because by utilizing the steps defined, I can assess the perceptions about why and which parts of the document system change were successful or not successful in the eyes of the stakeholders. The advantages of utilization of this theory over other theories is that (a) it is more flexible; (b) does not have or impose pre-defined structure; (c) allow multiple causal pathways; (d) contains levels and feedback loops which help to better reflect reality; and (e) is evidence based (DeSilva et al., 2014).

After the interviews, I reviewed the transcripts to see if the participants utilized steps similarto those in the ToC. I paid special attention to see if the participants knew what the goals of the change were, if they knew how to make the change sustainable, and what the markers of a successful change were (Kail, 2012). In this study, the documentation system had already been implemented; however, the ToC can be utilized to guide assessment of the decisions made during implementation and suggest what decisions may need to be recommended for future changes (Center for Theory of Change, 2015). Schierhout et al. (2013) conducted a similar study in which the ToC was utilized to evaluate the effectiveness of a quality improvement program with good results.

Nature of the Study

This was a case study, a type of qualitative descriptive research that is used to examine a small group of participants as a whole. For this study, the specific case involved employees at a hospital department that is unfamiliar to me and with which I have no affiliation. A case study is used as an illustration or an example to facilitate understanding of a concept and does not try to prove anything (Thorpe & Holt, 2009). The common purpose of a case study is to "represent reality, to convey a situation with all its cross current and rough edges" (Ellet, 2007, p. 13). The three characteristics of a case study are: a significant issue, sufficient information on which to base conclusions, and no stated conclusion (Ellet, 2007).

The qualitative case study method was the best fit for this study. Specifically, the focus of the study was a pediatric neurology group at an academic hospital in a large western city who modified their new documentation system to explicitly fit the group.

Data collection was done through interviews with all the individuals involved with EMR implementation and use. The group for this study was comprised of 15 people who were involved in this documentation system change, specifically four physicians, one clinical nurse, six technicians, two supervisors, and one administrator. The case study approach was determined to be appropriate because all of the study participants had undergone a similar event (a documentation system change). I examined how the change impacted each individual of the group and how they perceived its effect on the efficiency, quality of care, and patient outcomes for the group.

Limitations

The limitations of qualitative research are that the data have a higher likelihood of researcher bias affecting the results; the quality of the research is greatly dependent on the researcher; it can be difficult to articulate or demonstrate and maintain scholarly rigor; analysis and interpretation can be time consuming; and subject concern over anonymity and confidentially can alter responses (Anderson, 2010). Additional limitations specific to single case study research is that there is a risk of losing methodological rigor due to increased researcher subjectivity (Yin, 2014).

Specific to this study, the limitations were that only one medical group was examined and the results from this may not be applicable to different groups and disciplines. There is potential bias due to the researcher having been a health care professional who experienced a documentation system change in the past; however, this bias was addressed by focusing the study on a caregiver group being from a different

discipline, hospital, and using a different documentation system. All of these limitations were recognized when analyzing the results.

Assumptions

In every study, there are assumptions made and this study was no different. It was assumed that the participants in this study gave their honest opinions during their interview. It was assumed that a documentation system change had an effect on the study participants based on the studies by Friendberg et al. (2013) and Illing (2014). Another possible assumption made was that the documentation system change influenced the health care team's perceptions of patient care, outcomes, efficiency, and their job satisfaction.

Definitions

Affordable Care Act (ACA): A law signed by President Barack Obama in 2010, that is responsible for the reform of the United States' health care system of Medicare (Davis, 2014). The law was designed to increase quality and affordability of health insurance, decrease the uninsured rate, and decrease the cost of health care for the individual and the government (Davis, 2014).

Clinical documentation: The creation of a record that entails the medical treatment, medical trial, or clinical test (Rouse, 2014).

Electronic medical record: EMR has three standard definitions.

1. A digital version of patients' paper charts that are real-time, patient-centered records and allow the patient information available instantly and securely to authorized users (What is an Electronic Medical Record, 2014)

2. Data that are part of a patient record that is created, gathered, managed, and by medical providers and staff involved in a patient's care (Pera, Kaur & Rao, 2014).
3. A comprehensive patient history, designed to contain and share information from all providers involved in a patient's care can be created, managed, and consulted by authorized staff and providers from more than one organizations and can move with a patient (What is an Electronic Medical Record, 2014).

Other terms for EMR are electronic results management and patient data management systems.

Heath care team/ patient care team: "Care of patients by a multidisciplinary team usually organized under the leadership of a physician; each member of the team has specific responsibilities and the whole team contributes to the care of the patient" (Reference.MD, n.d., para. 1).

Health information technology: A specific type of information technology that is used in the management of information systems for health care. By utilizing the automated health care information systems it is expected to lower costs, improve efficiency and reduce error, while also providing better consumer care and service (Rouse, 2015).

Patient centered care: Patient care designed and focused with institutional resources and personnel organized around patients rather than around specialized departments (Patient Centered Care, 1993). Patient centered care began to become popular in the 1970s. Patient centered care is a movement that emphasizes a partnership

between practitioners and patients and encouraging patients to make their own informed health care choices (Robinson, Callister, Berry & Dearing, 2008).

Significance

Findings of this study may be used by medical facility leaders/decision makers as to how to institute changes and introduce documentation system changes that will be well received by providers and staff and implement them in a way that causes the least disruption. The data from this study could aide administrators and policy makers to align strategies, visions, and ways to implement a new EMR system that will decrease users' resistance to change and get the desired results of the EMR change (Bentley et al., 2014). This work affects social change because it will allow health care facilities to make changes (not just to documentation systems) that result in a more effective, efficient, and more satisfied medical group which will lead to better patient care and better quality of health care. Understanding the process of change on employees and their enabling factors has the potential to support and increase efforts to successfully implement electronic health records (Takian, Sheikh & Barber, 2014). This case study could create a new way for health care administrators to think about change; which could result in creating a faster, more cost effective health care system with a more satisfied group of providers and staff and healthier patients. The data from this study can potentially impact the way that policy makers and administrators decide and implement a documentation system. In this case study I sought a deeper understanding regarding the experiences of health care documentation system users after a change in systems.

Summary

The United States health care system is changing and health care efficiency is more important than ever. Electronic documentation systems are one way that policy makers feel that efficiency could be enhanced (Ancarani et al., 2009). Often documentation system changes and documentation system implementation decisions are made by non-clinical people based on parameters other than clinical necessity and therefore has the potential to decrease efficiency, patient safety, and quality of care for patients as well as increase stress and frustration of medical staff (Kerber et al., 2011 & Fox, 2013 & Helton, 2011). There is not enough extensive research on the effect of these system changes on the entire health care team or research on how to improve the health care team's attitude to adopt these systems. Thus, I conducted a case study with a health care group who has undergone a change to their electronic medical system. The test group was unique because they modified their EMR system to fit the needs of their specific group. Interviews were conducted with all members of the group to better understand factors that affected their attitude, intention, and adoption of a documentation system change. Data from this study can help other medical groups have a better transition to a new system.

Chapter 2: Literature Review

Introduction

EMR is an important part of the future of medicine. Medical professionals and hospital administrators are focusing more attention on EMR because of the recent requirement for their implementation and the challenges to adoption that have previously occurred (Fox, 2014). A fully functioning and well adopted EMR system can be used to record a larger quantity of medical information than paper documentation and makes the information more accessible, improving the continuity of care (Blacksburg et al., 2006). The entire health care group is affected when there is a documentation system change, yet little research has been done on what the health care teams' perceptions are about the new system (Cheater et al., 2009).

EMR changes could cause stress and health care team dissatisfaction which can be a public health threat. A stressed medical staff is more likely to have increased turnover and more medical errors and be less efficient (Kravitz, 2012). One of the main causes of professional dissatisfaction among physicians concerning EMR is due to the potential for frustration surrounding technical malfunctions, increased documentation time, and time away from patient face-face interaction (Fox, 2014). Physicians are concerned that EMR will decrease face-to-face discussions, increase administrative time, and become a barrier to quality care (Fox, 2014). Patients are also requiring more access to their medical records and looking for clinicians who have EMR; this then pressures health care teams to not only document in a way that will decrease liability but also in a way that patients can understand (Wang, 2012).

This chapter is divided into the following sections: the literature pertaining to the theoretical framework, documentation systems and their effect on health care, changes in the medical field related to documentation systems, and health care workers' satisfaction with their career. A literature gap was found regarding the perceptions of how the health care team feels during and after an EMR change.

Literature Search Strategy

The library databases that I accessed for this search were from Walden Library and the University of Colorado Medical Library. The search engines that I used were Google Scholar, PubMed, CINAHL, and Medline. The key search terms were: *documentation system*, *health care provider*, *health care team, hospital efficiency, health care change, electronic medical records*, and the *theory of change.*

I searched full articles that were dated from 1988-2016. There was no specific date for the invention of EMR but they were considered, in the IT arena, to be first invented in the 1960s (Leslie, Doscher & Toner, 2012). I selected 1988 as the earliest time period because that is when EMR are thought to be first routinely implemented (Leslie, Doscher & Toner, 2012). The search began by searching all of the terms in each engine. Refinements were made based on the keywords and the results in relevant articles to attempt to find relevant articles that were not picked up by the initial search criteria. I found, reviewed, and identified approximately 200 sources and about 80% were peer-reviewed. I stopped my literature when I felt that I had searched and found all of the pertinent content on this topic.

Theoretical Framework

The theory of change (ToC) served as the theoretical foundation for this study. In this study, I examined the effects on the health care team when a documentation system change is implemented. I believe the ToC was a good theory for this study because the steps of the EMR change were closely examined from the perspective of the stakeholders (healthcare team) and for this study I looked at how the stakeholders perceived the EMR system change. Looking at how the study group implemented their change, how they perceived the implementation, and comparing it to steps of the ToC made it possible for me to analyze what actions were successful in the study participants' acceptance of the EMR change. All of the steps recommended in ToC are necessary for creating a method to achieve the goals. These steps also help to develop objective and measureable ways to assess the effectiveness of the change and ensure those involved understand who to identify if the change was successful (DeSilva et al., 2014). For a change to be well adopted, there must be a clear pathway to achieve the goal, assumptions must be articulated, and steps defined (Center for Theory of Change, 2013). I used the ToC as a framework that then created an understanding of what steps of implementation were needed to achieve a successful EMR change. I then traced the steps back to see what were the decisions with the greatest effect on the personal perceptions. This resulted in a greater depth of knowledge about what was successful and what was not for this group during the documentation system change and its implementation, similar to the effectiveness measurement described by DeSilva et al. (2014). The limitations of the ToC are that this theory is not commonly used in this research context and it is not well

known as an evaluation method for complex health interventions (DeSilva et al., 2014). De Silva et al. used the ToC to retrospectively evaluate and recommend a framework for complex interventions. Utilizing the lens of reversing the steps from the theory of change potentially could be the key for understanding the successful adoption of a new EMR system.

Documentation Systems

Health care today is faced with many more challenges than just providing good patient care (Munyisia, Yu & Hailey, 2011). Today, health care providers must account for excellent patient care, protect against liability, increase efficiency, reduce costs, and increase patient data access (Munyisia et al., 2011). The challenges for implementing electronic medical systems are the concern for system cost, the time to set up and learn the new system, the concern for keeping medical information private, and maintenance of a system (Ferris et al., 2009). EMR can be a challenge for small practices, hospitals, or rural health care systems where resources are limited due to limited finances, resources, and personnel (Munyisia et al., 2011). The result is an increase in the health care gap between well-funded clinics and those that are rural or underprivileged which creates further health care disparity due to smaller clinics not being able to afford to transition to EMR (Ferris et al., 2009). If EMR is universally adopted, it could lead to major health savings, reduced medical errors, improved patient care, increased efficiency, increase medical data access, and increased productivity and care coordination but as noted previously, there are several concerns and risks as well (Hillestad et al., 2005; Lau et al. 2012).

Documentation in Non-Medical Industries

In other industries, increasing the information technology (IT) role has shown great benefits. It is estimated that an improvement in health care IT could lead to major savings estimated at $346-$813 billion per year (Hillestad et al., 2005). More recent data about the current cost savings estimations or actual values in the U.S. are not available after an extensive literature review. Most likely this is due to the dynamic differences in clinics and practices where it is very difficult to gage the exact cost savings. It is understood that there is a "real need for further analysis to determine whether EMR is financially cost-effective in real-life clinical settings" (Choi, Lee & Rhee, 2013, p. 205). Many policy makers feel that implementing EMR in hospitals would be a major cost reducing method due to IT updates previously working well in other industries (Helton, 2013). Hillestad et al. (2005) found that other industries (telecommunications, securities trading, online shopping, and brokerages) had record annual growth, higher efficiency, and cost saving after IT improvement. Leaders are now seeing that the U.S. health care industry, which is possibly one of the "world's largest and most inefficient enterprises," (Hillestad et al., 2005, p. 2) could possibly have the same benefits seen in the telecom and securities industry with the increase in IT usage. This has led to increased pressure from the United States' legislators for hospitals to increase the role of information technologies in health care with the assumption that the medical industry will have the same cost saving results (Helton, 2013).

Effect on Staff Efficiency and Productivity

Staff efficiency and productivity is also becoming of utmost importance in health care but it is unknown if electronic documentation systems will reduce the time spent documenting for staff (Munyisia et al., 2011). Helton (2011) stated that over half of hospital expenses are for labor and when labor is more efficient, the result is significant cost savings. Kreber et al. (2011) predicted that EMR will also increase process utilization and aid in billing efficiency.

An EMR system can lead to more efficient health care (Choi et al., 2013). A fully functioning EMR system can make staff more efficient by alerting them to needed vaccinations, medicine interactions, allergy alerts, providing more access to needed data, and allowing for easier collaboration (Ferris et al., 2013; Morton et al., 2006; Shekelle et al, 2006). Munyisia et al. (2011) found that the success, efficiency, and receptivity of the system are dependent on how the EMR system is introduced and the actual specific individual software system. Some organizations have already found major gains in their quality of care, medical error prevention, and reduction of unnecessary care costs (Choi et al., 2013). Choi et al. (2013) also found that one group was able to reduce the number of full-time equivalent employees when they moved to EMR due to not needing staff for paper chart management. Munyisia et al (2011) found that the positive feedback with implementation of electronic documentation systems resulted in increased patient data recording accessibility, accuracy, and ease of reading, therefore aiding in the increase in staff efficiency (Munyisia et al., 2011).

Although there are several sources that showed that EMR did increase efficiency, some showed that there was the opposite or no improvement (Helton, 2011). In some situations there was an increase in time spent on documentation when an electronic system was introduced (Dastagir et al., 2012; Lau et al., 2012; Munyisia et al., 2011). In some clinics and hospitals, the users found the systems to be frustrating and inefficient (Munyisia et al., 2011). Fox (2013) found that providers felt that EMR created more clerical work, decreased face-to-face patient time, and degraded the accuracy of medical records due to the templates.

The difference between perceptions of EMR creating or decreasing efficiency may be related to how the system was implemented, the support for the system after implementation, the attitudes of the users, and the establishments' commitment to the system (Gastaldi et al., 2012; Martin & Voynov, 2014). Gastaldi et al. (2012) point out that hospitals are being pushed to do more with less that then creates increased stress and pressure on the staff, in particular, when an EMR system without good implementation is forced upon them. This creates an unsuccessful adoption or perceived decreased efficiency by the staff.

Documentation System Concerns

Some of the other concerns with implementing an EMR are the complexity, the cost of the startup, the maintenance, ensured patient privacy, and the training and equipment needed (Ferris et al., 2009). A documentation system may decrease patient interaction, unintentionally act as a check-list, change clinical decision making, and increase health care administrative time (Fox, 2014; Kerber et al., 2011). Other concerns

are that there could be a breach of patient information security, there is no research that backs up whether it is beneficial to patients, health care, health care staff and if there is actually a cost savings when implemented (Gastaldi et al., 2012).

There is also a concern that implementation of EMR and documentation systems will increase the disparity of quality of care (good up to date medical care) because more affluent clinics and populations will be able to afford the technology while the clinics with fewer resources will not (Ferris et al., 2009). Adding EMR and other technical advantages may not only increase quality care to more affluent patients and areas but it could also potentially attract higher quality staff, and payers and providers that may not choose to service rural or underserved areas (Martin & Voynov, 2014).

Documentation System Benefits

EMR benefits are that there is a large potential for health care cost savings, increased patient safety, higher efficiency, better coordination of care, better medicine, and treatment management, better care coordination and increased preventative care (Martin & Voynov, 2014; Mason & Albright, 2012; Munyisia et al., 2011). EMR can enhance quality of care by increasing the ability to build evidence-based protocols, view and evaluate practices, increase collaboration, and share patient information (Pera, Kaur & Rao, 2014). EMR can increase safety by decreasing the likelihood of handwriting interpretation errors, establish automatic allergy and medication interaction alerts, and the availability of the patient record to be seen by collaborating medical providers can be accomplished (Pera et al., 2014). Efficiency and cost containment is of growing importance in health care and EMR is one way that medicine could become more

efficient due to the potential to increased quality, decreased errors and increased coordinated care (Hillestad et al., 2005). Hotchkiss, Mason and Albright (2012) found that provider satisfaction was higher with a fully functional EMR system because they felt it decreased the chance for errors, increased provider access to patient information, improved communication between providers and patients, and decreased the time it took to document visits.

Hotchkiss et al. (2012) found that health care workers expressed a readiness and eagerness to have an EMR and documenting system and that there is greater career satisfaction when there is a fully functioning system in place (Hotchkiss, et al., 2012). Hotchkiss et al. (2012) stated that "the beliefs, behaviors, and attitudes held by the practitioners within these clinics can greatly facilitate or inhibit the adoption of technology and could greatly impact the potential of EMR and e-prescribing" (p. 81). Munyisia et al. (2011) suggest that during a documentation system introduction, the success depends on other factors such as speed of the system, users' familiarity with the system, speed of typing, and comfort with technology.

Medicine is getting more advanced and more complex, which is leading to greater challenges managing medical records. Records need to be available for provider collaboration combined with the need for patient privacy as well as patient involvement; EMR is a way to address all of these challenges (Ferris et al., 2009). Patient safety can be increased by EMR due to e-prescribing, increased accessibility of records, and continued tracking for hospital quality improvement (Pera et al., 2014). Electronic prescribing and EMR can alert prescribers of a medication interaction, decrease errors

with handwriting interpretation, check against allergies, and allow quick access to lab results, test results , and vital signs (Pera et al., 2014). EMR can create a much more efficient system by decreasing the staff needed to manage health records (Choi et al., 2011). EMR use is predicted to increase the ability to efficiently record, retrieve, and share medical information which will increase the ability for members of the health care team to collaborate and access patient information (Munyisia et al, 2011). EMR records will increase the ability to bill efficiently and accurately with the data being more easily researched and utilized for quality improvement (Kreber, 2011).

Documentation System Implementation

The resistance from providers in implementing EMR is mostly due to low computer literacy, inadequate training, and a system that does not fit the practice, as well as cost concerns (Dastigir et al., 2012). There may be resistance to change in health care staff due to past changes that increased their workload pressure and did not improve the health care practice (Cheater et al., 2009).

One way to increase the success of a documentation system introduction is to adequately prepare the team for it (Dastagir et al., 2012). Administration must set up the infrastructure for EMR for it to be successfully adopted (Hotchkiss et al. 2012). Change is most successful when strategies are identified to address barriers such as uncertainty or peer/social issues (Cheater et al. 2009). It is important for administrators to understand how the staff learns effectively and then implement a training system that fits with those learning styles to adequately institute an EMR system with successful adoption (Takian,

Sheikh & Barber, 2014). The way a change is implemented has the most variable impact on the compliance and effectiveness of the change (Cheater et al. 2009).

One of the greatest limiting factors for EMR success is the lack of technical knowledge and solutions after introduction (Gastaldi et al., 2012). Dastigir et al. (2012) concluded that training alone was not enough to make physicians and staff proficient in utilizing the electronic system. Thus, the introduction of EMR must not only focus on the technology but must focus on the patients, reduction of resistance of staff, and the minimization of disruptions to the work-flow (Bentley et al., 2014). If administration builds a good infrastructure, meets providers' needs, and keeps the patients the focus, there is a better chance for decreased provider speculation, uncertainty, and resistance which will enable a smoother and more successful adoption of the new EMR system (Hotchkiss et al., 2012).

There have been many methods of EMR system training including, but not limited to, web-based, remote phone, classroom, EMR functionality, case-based, role-based, process-based, mock-clinic , and "on the job" training (Dastigir, et al., 2012). One limitation that commonly occurred that limited effective training is the high cost associated with conducting quality and extensive training (Dastigir et al., 2012). Dastigir et al. found that a program led by physician expert peers was the most effective for decreasing health care staff resistance. It was also found to be of great importance that seeing a high volume of patients during training was very difficult and resulted in insufficient learning (Dastigir, et al., 2012), thus patient load must be limited during provider training on a new system.

Provider Satisfaction

Health care provider satisfaction is a very important topic. The public health implications of dissatisfied physicians are that they are more likely to have poor clinical management, noncompliance among patients, and rapid turnover in staff leading to discontinuous and substandard health care (Zuger, 2004). A satisfied health care workforce leads to more engaged practitioners and is essential for delivering quality care (Kravitz, 2012). Aspects that potentially lead to provider and staff satisfaction are workload, income, time consumed by administrative tasks, practice management, job related perception, professional control and autonomy (Tyssen, Palmer, Solberg, Voltmer & Frank, 2013; Zuger, 2004). One can see that EMR touches on three of these aspects (workload, administrative tasks, and practice management). Documentation systems can greatly affect the health care teams' career satisfaction level because they spend so much time utilizing it and it is such a big part of current practice (Sittig, Kuperman & Fiskio, 1999).

It has been well documented that physicians' perceptions of how satisfied they are with their career is a strong indicator of a nation's health care system. Physicians' career satisfaction has been closely linked to the quality of care rendered (Tyssen et al., 2013). The heath care team is more likely to be satisfied when they have more professional control and autonomy (Tyssen, et al., 2013) but many documentation system changes and choices are made and implemented as authority innovation decisions with little or no health care provider or staff input (Hotchkiss et al., 2012). A good documentation system or EMR system can improve physicians' perceptions of efficiency, ability to provide

good patient care, and have a major impact on overall job satisfaction (Dastagir et al., 2012).

Nafees (2011) states, "The idea of user satisfaction is not new. But how important it is in quality in use is new and under description" (p. 48) when describing technology user satisfaction. In computer science the customer plays an important role in software quality and customer satisfaction is becoming a requirement (Nafees, 2011). In the past, physicians' acceptance of EMR was a challenge and EMR implementation became a major contributor to physician burn out and career dissatisfaction making successful implementation of an EMR difficult (Sittig et al., 1999). Sittig et al. mention that when physicians were surveyed they stated that the screen design, layout, and capabilities were of the biggest importance in an EMR; however, this study was in 1999. In a more recent article, Ferris et al. (2013) note that health care workers are more willing to adopt an EMR but the extent of adoption is what indicates if the users will be satisfied; partial adoption of an EMR system led to concerns with safety, decreased efficiency, and higher dissatisfaction. Ferris et al. stated that "a detailed process flow be drafted by practice managers, and providers before implementation of a new system" (p. 590). Additionally, implementation plans need to be monitored closely and barriers removed when the implementation happens if higher satisfaction and successful adoption is desired.

How EMR System Change Affects the Health Care Team

Change in health care is a constant and how the change is disseminated and implemented can have a big impact on the success, the resistance, and the adoption of a new system (Cheater et al., 2009). This could be due to the substantial growth in health

care and health care spending which causes policy makers to continually search for cost-saving and liability decreasing measures (Zhivan & Diana, 2011). Cheater et al. state that more research is needed to study health care change. The use of ToC can describe the why and how of a social change and might be very helpful to guide successful change in health care (DeSilva et al., 2014).

Possible barriers to change when a new EMR system is introduced can be: uncertainty, threat to competence, perception of liability, user expectations, changes in standards of practice, financial challenges, and administrative constraints (Cheater et al., 2009). The way that a successful change is measured can also influence the impact of the change. For example, in a hospital, measurements for higher efficiency are shorter wait times, lower nurse-staffing levels, and reduced patient lengths of stay; however, pressuring the health care team to increase these markers can equate to the quality of care being compromised (Jha et al., 2009). It is difficult to adjust outcome parametrics, however, findings suggest that by implementing change that appeals to a wide variety of learning styles (e.g. address user expectations and competence), the change will be more successful (Lee et al., 2011). Good implementation of change and a clear and effective way of evaluating can increase care and patient outcomes (Cheater et al., 2009).

Hospital Efficiency

Hospital efficiency is very important and is an aspect of health care that is becoming more examined by administration (Barnum et al., 2009). Hospital administrators are faced with rising costs and increased concerns about quality of care (Jha et al., 2009). Administrative complexity is created when there are new rules, forms,

and protocols that create inefficient or misguided treatments, procedures or methods (Berwick & Hackbarth, 2012). One of the challenges is that higher health care spending and higher efficiency do not equate to higher quality of care (Bach, 2013; Jha et al., 2009). These pressures for administrations to be more efficient with limited budgets, sometimes force policy makers and hospital managers to make ineffective or counterproductive changes (Barnum et al. 2009). It is of great importance to streamline care for all patients while not decreasing the quality of care (Bach, 2013).

The opposite of good efficiency is wasteful health care spending that happens when there is a failure of care coordination, overtreatment, administrative complexity, defensive medicine, pricing failures, and fraud/abuse (Berwick & Hackbarth, 2012). Increasing care coordination (through a good documentation system) would decrease the amount of patients who get lost in a treatment system end up with fragmented care resulting in complications, hospital readmissions, and decreased functional status (Berwick & Hackbarth, 2012). Overtreatment potentially comes from the threat of legal actions, patients' preferences, supply-rooted behaviors such as extra tests, unnecessary antibiotic use, and extensive care for end of life patients (Berwick & Hackbarth, 2012). This is a very complex situation due to the difficult balancing of increasing hospital efficiency and efficacy while decreasing spending without compromising patient care and quality of care (Jha et al., 2009). These are also factors that are affecting the health care team and could influence their adoption of a new EMR system.

One possible solution for greater acceptance of EMR is to have better management of the EMR system that could lead to lower costs and better care (Jha et al.,

2009). Another aspect that possibly could improve many of the aspects of efficiency is computerized documentation systems (Helton, 2011). A good documentation system can impact the hospital efficiency, patient safety, health care staff morale, coordination of care, hospital spending, and efficiency of care (Munyisia, et al., 2011).

Health care staff's attitudes and willingness to adopt a new EMR system can play a major role in the successful implementation of a new system. This is where this study is very helpful. The data from this study shows how a change in documentation system impacts the health care team.

Summary

There is a literature gap regarding the effect on the health care team during a documentation system change. The literature shows that there are clear benefits and challenges to implementing an EMR system. There is also literature support to show that stressed and dissatisfied health care workers are a public health threat. In some cases it has been shown that EMR implementation is one of the leading causes of provider dissatisfaction. The data that this study produced contributes to decreasing that gap of knowledge regarding how the health care team perceives how a change in EMR system affects them. The next chapter describes the methodology that will be used.

Chapter 3: Research Method

Introduction

The purpose of this study was to examine the participants' perceptions of a documentation system change. The results from this study may be meaningful to the public health discipline. Making good decisions about changing documentation systems and implementation will lead to a more efficient transition, more satisfied health care providers, more efficient, safer health care which will lead to better patient outcomes, and better policies for implementing change (Blacksburg et al., 2013; Helton, 2011). Documentation systems have become an important part of medicine today due to the potential for increased efficiency and better access to, and coordination of, patients' medical information (Blacksburg et al., 2013). Medical documentation is extremely important for continuation of care. It can decrease medical liability by more accurately recording medical data (Blacksburg et al., 2013). Therefore, it is becoming a major indicator of health care quality (Helton, 2011). Documentation plays a large role in reducing legality as well because of documentation (Blacksburg et al., 2013). EMR helps health care professions treat patients efficiently in the treatment of patients because it serves as a portal for health care information including vital signs, medications, and other important data (Helton, 2011). EMR systems offer members of the health care team a better ways to record and organize health documentation but several challenges remain as to its acceptance (Blacksburg et al., 2013). I hoped to increase data available to health professionals regarding perceptions of health care staff when a documentation system changes as a result of this study.

The satisfaction of the actual EMR system users, the health care staff (physicians, midlevel providers, nurses, medical assistants, social workers, unit secretaries, and office staff), in relation to EMR implementation is something that is significant and has not been significantly studied (Wang, 2012). EMR and EMR implementation is an important aspect for hospitals to master to improve efficiency and meet federal requirements (Wang, 2012).

EMR and EMR implementation is important to study because it is imperative to understand how the primary documentation system user, the primary care giver, is affected by the change to a new EMR. Healthy People 2020 (2014) listed health communication and health information technology as an interventions and resources objective and noted that "health communication and health information technology are central to health care, public health, and the way our society views health" (para. 2). In this chapter the research design, rationale, and the purpose of the study will be explained. The role of the researcher will be outlined and the methodology and issues of trustworthiness that were used are documented.

Research Design and Rationale

The purpose of this study was to get a deeper understanding of what happens to a health care team when a documentation system is changed. I wanted to identify and analyze what their thoughts were about a documentation system change. I chose to study this group because they underwent a documentation system change and altered the steps to make it work for them by creating very specific flowsheets to aide them in the documentation of their specific patient population. This was an interesting group to study

because they are a varied group in terms of age of members, electronic comfort, education, and connection.

I believe that it was appropriate to use a single case study approach for this study because it is a good way to study a complex situation within the environment where it is taking place (Baxter & Jack, 2008). Case studies are a good choice for research such as this where the subject is organizational in nature (Stake, 1995). They are the preferred method for answering "how and why" questions in situations that are technically difficult with a lot of variables (Kohlbacher, 2006). In this study, I did not seek to develop a new theory, completely describe a cultural group, or document the life experiences of an individual. Therefore, grounded theory, phenomenological, or narrative approaches were not appropriate (Creswell, 2007). I wanted to understand how the entire group of individuals, who all went through the same event of an EMR system change, perceived their experience. The best method for doing this was a single case study.

Role of the Researcher

I collected the data and conducted and analyzed interviews to address the research questions. As the researcher, I worked directly with the case study participants. I had no personal or professional relationships with the participants.

There was a chance that I had researcher bias due to my education and past work as a nurse and a physician assistant where I had extensive experience with documentation system changes. I acknowledged this issue prior to doing this study as a possibility of bias that could sway may research (Yin, 2014). In an effort to mitigate this bias, I

reported preliminary findings of the data and had the study participants review and confirm accuracy of the data (Yin, 2014).

Methodology

The population for this study was a pediatric neurology group employed by a hospital during the time of a documentation system change. This was a group comprised of four physicians, one nurse, seven technicians, two supervisors and one administrator. All of these people were affected by the change in documentation system. There was a pilot study of three people outside the neurology group but involved with clinical medicine to get a sense of how long the interviews will take, how the questions will read. The pilot study participants also underwent a recent documentation system change. The pilot study interviews helped to determine the actual length of the interviews. It also helped to determine if there were any changes that needed to be made to the interview questions. The result of the pilot study was that minor changes were made to the interview questions that were subsequently approved by the IRB.

The participants for the case study were recruited by inviting available providers including MDs, PAs, nurses, technicians, and administrative IT decision makers within the neurology group to voluntarily participate. I did not interview those who did not interact with the EMR, e.g., Professional Research Associates (PRAs) and staff. I met with the group and explained the project and asked for volunteers. If they agreed to participate, I set up a time for the interview. At the beginning of the interview, each person was given a consent form (see appendix B). I conducted the interviews at a location and at a time that was convenient for them. The interviews were scheduled for

one hour with additional time allowed if needed; if they were not able to stay but the interview is not completed, another time was to be scheduled. I was the only one who conducted the interviews.

Interviewing is a basic mode of inquiry where the purpose is not to get answers that specifically test hypotheses or evaluate but instead have a research interest in another individual's story because it is of worth (Seidman, 2006). It is never possible to understand another human's behaviors perfectly but through interviews it is possible to comprehend their actions (Seidman, 2006). The interviews consisted of open-ended questions and was more conversationally based. This allowed participants to expand on their answers. Having a more open, conversational interview allowed me to gain a deeper understanding of the experiences, feelings, opinions, and thoughts regarding the documentation change through the eyes of the participants (Kvale, 1996). I personally collected the data. See Appendix A for the interview questions.

The inclusion criteria for the participants were that they were part of the pediatric neurology group and were part of the team when the documentation system change occurred. I verified that the criteria had been met by ensuring that all members of the study were present during the document system change. All members of the pediatric neurology group who meet the inclusion criteria were invited and encouraged to participate.

All those who agreed to be involved were interviewed. Due to this being a case study, all members should be interviewed to ensure adequate data collection (Yin, 2014). However, since not all members were able or willing to participate, it was noted in the

limitations of this study. The goal was to collect all data over one month. I interviewed members and then transcribed the interviews; all participants were given the transcript via email to review their responses. They had two weeks to either meet with me again to modify their answers to more accurately reflect their experience and feelings or email me revisions to their answers. The duration of the data collection was over 6 weeks (one month for interviews and 2 weeks for revisions). I transcribed all interviews from the audiotapes that I took during the interviews.

The interviews were scheduled for 1 hour with the understanding that, if additional time was required, it could go over. The people interviewed had the opportunity to extend the time as needed but it was not required. The likely length of the interviews was established during the pilot study. All interviews were recorded and then transcribed into a Microsoft Word document. I was the designated transcriber to support participant privacy. I also maintained a journal of notes during the interview interactions with the study participants.

Data Analysis Plan

Analysis is taking apart data and putting it back together in a meaningful way (Creswell, 2007). Case study analysis has the same challenges that other qualitative research has and various criteria can be utilized for the analysis (Thorpe & Holt, 2008). Case studies typically use a six step process for data collection and analysis: (a) personal interviews, (b) transcription of data collected during the interview, (c) identification of relevant statements within the transcription, (d) interpretation of meanings in each statement, (e) finding common themes, and (f) combining recognized themes to create a

narrative of the situation being studied (Creswell, 2007). Some of the different types of analyses that can be utilized are constant comparison, interpretative, grounded theory, structured analysis (software based), and intuitive analysis; I utilized the interpretative analysis (Thorpe & Holt, 2008). According to Yin (2014), case study analysis does not need any quantitative or statistical analysis.

Guiding the development of interview questions and category development were the principles and suggested building blocks of change from the theory of change with the purpose of answering the four research questions. Case study and qualitative analysis is often custom-built and revised during the process due to the nature of the data and that was allowed and expected in this study (Creswell, 1998). By utilizing the naturalistic generalizations and narrative reporting, other health care workers and administrators can learn from the data, forming their own understanding and apply it to different cases (Creswell, 2007).

I read the transcripts and notes from the interviews several times and highlighted the overarching themes (Thorpe & Holt, 2009). After several reviews of the transcripts, common and significant statements and words were highlighted. These words and statements were assigned a code and the codes were put into an Excel table. Initially, to prevent a-priori observer bias, the codes were simply a series of letters (A, B, C, D, E, etc.) that were not pre-defined and assigned to an overarching theme, word or statement. Specific meanings or names associated with each code letter were assigned based upon completion of the initial transcription and review of the interviews. The final table of themes and codes were designed to exhibit the participants' experiences and perceptions

related to the documentation system change (Thorpe & Holt, 2009) at which point I assigned relevant words or phrases that reflected the theme. I remained open minded throughout the process to allow meanings to emerge from the data that are not related to any presuppositions. Data were organized in a table with columns for the participants' personal identification number, and my assigned code for each question so that common themes and possible relationships could be found. The code key is an explanation of what each code means. The table was then used to see common themes that were put into categories and then into patterns or themes (Creswell, 2007). Pattern matching is "one of the most desirable techniques" for case study analysis (Yin, 2014, p. 143).

Once all transcripts had been reviewed several times and significant statements and words highlighted, I assigned codes and then put into the table. In the next step, I used codes to delineate the common themes. Again, to avoid a-priori bias, I did not assign predetermined codes other than "positive" and "negative" to any responses. Once the positive and negative statements were reviewed, codes were assigned. If significant answers were given by only one person, these single answers were noted in positive and negative statements and coded as miscellaneous. I generated the themes from the codes (see Table 1 for a sample code table.)

Table 1

Letter Coding of Positive and Negative Statements in Interview Transcripts

Code	Positive words/statements	Negative words/statements	Code
A	Efficient	Tedious	**M**
B	Easy to learn or use	Inefficient	**N**
C	Organized	Difficult to use/understand	**O**
D	Access/Accessibility	Technical problems	**P**
E	Improved documentation	Took time away from patients	**Q**
F	Decreased documentation time	Increased documentation time	**R**
G	Increased quality of care	Decreased quality of care	**S**
H	I see the benefit in this system	Didn't help practice	**T**
I	Increased moral	Decreased moral	**U**
J	I felt supported	Increased frustration	**V**
K	It was implemented well	I am thinking of resigning/retiring due to the implementation	**W**
L	The technical support was helpful/good/sufficient	Poorly implemented	**X**

Issues of Trustworthiness

The trustworthiness of this study was created through credibility, transferability, dependability and confirmability (Shenton, 2003). Credibility is the internal validity of the study (Shenton, 2003) and can be established through field observation, participant checks and validation (Morrow, 2005). For this study the credibility was established by good technique, adequate literature review and validation from the participants. Transferability is the external validity and generalizability of the study (Shenton, 2003). Qualitative data are often more difficult to be generalized due to the small number of participants and lack of statistical data. Transferability is achieved by having the

researcher (myself) provide sufficient information about themselves (due to the researcher being the instrument) and not implying that the findings can be generalized to other populations or settings (Morrow, 2005). Transferability was established in this study through noting the exact procedures of the study. Other researchers will then be able to determine whether these results can apply to them.

Dependability is the reliability of the study (Shenton, 2003). Reliability is increased when the operations of a study, such as data collection, can be repeated with similar results (Yin, 2014). Dependability/reliability was established in this study by utilizing good technique for interviews (Morrow, 2005). The interview, data collection, and analysis procedures are documented herein for review.

Confirmability is the presence of objectivity in the study (Shenton, 2003). Confirmability is achieved by first acknowledging that the data are not objective and secondly adequately tying the findings with the analytic process and maintaining a way for a reader to confirm the adequacy of the findings (Morrow, 2005). The confirmability was established in this study utilizing a theoretical framework, transcribing the complete interview, and having the study participants check the transcriptions.

Ethical Procedures

Access to the case study participants was through voluntarily participation by the group with permission from the University of Colorado. The treatment of human participants was considered ethical and fair per IRB review. It was recognized that good treatment of interviewees be of the utmost importance. All participants were allowed and encouraged to review their transcribed interviews for accuracy. The institutional

permissions needed were from the University of Colorado Health Sciences Center, the Walden University IRB, and the pediatric neurology group. The ethical concerns were maintaining ethical treatment of all case study members that allowing them to express true and authentic thoughts about their experience without fear of retaliation or negative impact. The goal was to have as little impact on the study participants, cooperating group and institution as possible. The ethical concerns were addressed by gaining approval from the Walden University IRB, openly educating participants about the study, admitting potential biases and protecting the identity of the study participants.

After interviews, the data were transcribed and then shared with the individual interviewed to ensure accuracy and their comfort with the data collected. The data then was placed into a table for further analysis. The data were de-identified where I was the only one with access to key identifying information.

Summary

Data collection is a time consuming and detailed process and to have credible and valid data it must align with a theoretical framework, ensure ethical treatment of participants and be able to be disseminated in clear results. For this study, I worked closely with a pediatric neurology group to gain more knowledge about how a medical group felt during their documentation system change. This is a small group and so I was able to gain a deeper insight into each member of the group's experience. The data were collected through face-to-face interviews. Interview audiotapes were transcribed and then data were categorized into a table (showing participant number, demographics and codes of answers) and the transcription was shared with the participants to validate

accuracy. The data were hand coded to identify meaningful themes. The study participants all signed an informed consent and IRB approval was obtained to ensure the ethical treatment of all participants.

In chapter four I will discuss the participants, including their demographics, backgrounds, comfort with technology and their experience. I will go into more detail about how the data were collected and analyzed.

Chapter 4: Results

Introduction

The purpose of this case study was to explore the attitudes and perceptions of health care team members regarding the impacts of documentation system changes on quality of care and efficiency. Health care providers are very reluctant to use EMR systems due to the challenges and concerns that come with a new EMR system (Friedberg et al., 2013). I personally experienced and observed the increase in documentation time, the decrease in morale, and the increase in frustration when I went through documentation system changes. This was my motivation and sparked my interest in this area.

Through this research, I examined the attitudes and perceptions of health care team members after the implementation of an EMR system. This was a qualitative case study research project guided by the theory of change. I conducted interviews to collect data (see Appendix A for a list of the 12 open-ended questions that I used). In this chapter I will cover the pilot study that I conducted and what changes were made as a result of findings. This chapter will include information about the study setting and demographics of the study participants. I will also provide an overview of the data collection, the data analysis, evidence of trustworthiness, and show the results.

Pilot Study

I conducted the pilot study to estimate interview time and to determine whether the questions were clear to participants. I interviewed a physician, a physician assistant, and a nurse. The pilot study participants were from different hospitals in the area, but all

had experienced a recent EMR change. I conducted pilot interviews at convenient locations for the participants. The interviews were conducted and recorded using the same protocol as the primary study; they were subsequently transcribed. Answers from the pilot study were not utilized for the data analysis for the primary study. As a result of the pilot study, two questions were reworded and one question was added. The changes were submitted to the Walden IRB and were subsequently approved (see Appendix A for both the initial and revised interview questions).

Setting

The interviews took place at a large academic hospital in central Colorado. Half of the interviews took place in a conference room in the inpatient pavilion. This is where the epilepsy group meets for their weekly department meeting. The other interviews took place in participants' offices both in the hospital and in the clinic. One interview took place in a break room because the participant wanted to meet there.

There were possible personal and organizational conditions that could have influenced participants at the time of the interview. I observed that participants interviewed on the same day had similar answers. This could have been due to the participants' current workload, recent EMR discussions, and recent EMR experiences which could have influenced their answers. An example of this would be if the participant had a problem with the EMR and spoke about it to a colleague; there would then be the potential that the discussion could have changed how they both answered.

Demographics

I presented an outline of this study at the neurology department meeting on February 11, 2016. I subsequently interviewed 15 individuals. Participants included one team administrator, two technician supervisors, four medical doctors, one nurse, and seven technicians. The staff had grown and changed since the initial proposal of this work so the predicted group compilation, mentioned in chapter 3, changed to reflect the current group. Several physicians and physician assistants elected to not participate. All of the participants met the study criteria because they were present during a change in their current documentation system within the group. I did not directly ask the ages of the participants but there was a range of individuals from those for whom this was their first job to much more experienced participants. The approximate age and experience level became relevant to the study due to the extent of the participants' past EMR experience, computer savvy/comfort, and clinical experience; each possibly influencing their answers or their perception of the EMR system. (See Table 2 for the demographics of participants.)

Table 2

Demographics of Participants

Participant No.	Position	Gender	Years of experience	Length of interview (Minutes)
I1	Administrative	Female	2-15	8:09
I2	Physician	Female	2-15	11:49
I3	Technician	Female	< 2	4:01
I4	Technician	Female	2-15	6:44

I5	Technician	Female	< 2	7:01
I6	Technician	Female	< 2	4:58
I7	Technician	Male	2-15	3:57
I8	Physician	Male	> 15	12:34
I9	Supervisor	Female	< 2	6:26
I10	Technician	Female	> 15	4:49
I11	Technician	Female	2-15	7:24
I12	Supervisor	Female	> 15	3:52
I13	Nurse	Female	> 15	9:17
I14	Physician	Female	2-15	17:42
I15	Physician	Female	2-15	14:00

Data Analysis

Interviews

The interviews were conducted on one Tuesday and two Thursdays because these were days that the group identified as best for the participants. The length of the interviews ranged from approximately 4 - 18 minutes.

To start the interviews, participants were given a consent form (see appendix B) and asked to keep a copy for their records. All interviews were recorded and transcribed. All participants asked for their transcript to be emailed directly to them to allow each individual to check for interview accuracy rather than me returning it to them in-person. After the transcripts were reviewed I verified with them in person to ensure accuracy and to determine the particular changes the participant made.

There were a few variations in how the data were collected when compared with the plan presented in Chapter 3. The first variation was that no list of individuals involved in the documentation system change was provided to me by the head of the

group. Instead, I met with the entire group personally at their department staff meeting. My invitation to participate letter was added to their agenda and available for all members of the department to view. During this meeting I introduced myself, my study, and explained what participation would entail. When I initially contacted the group in 2013 and they agreed to participate in the study, I obtained an estimate of potential participants. From that time to when the interviews were conducted in 2016, the group population changed resulting in an increased actual number of participants from the estimated participant numbers as well as their work roles. The second variation from the plan as noted in Chapter 3 was that the interviews did not take the anticipated hour, although they were scheduled for such. The interviews took place over three weeks and participants had two weeks to review their interview transcription for accuracy and content.

Data Analysis

The data analysis plan as detailed in chapter 3 was followed. Transcripts and notes from the interviews were read several times and highlighted denoting overarching statements and words (Thorpe & Holt, 2009). These words and statements were assigned a code and the codes were put into a table (Table 2). Table 2 exhibits the participants' experiences and perceptions related to the documentation system change through the common response terms relative to each question (Thorpe & Holt, 2009). The codes then evolved into themes and are displayed in a theme table presented in Table 3 (Creswell, 2007).

Table 3

Code Table

Question	Codes	# of responses
1	Positive impact on my work Increased/changed role or work Inaccurate data Decreased time with patients	9 5 5 7
2	Challenges Needed in-clinic specific and ongoing training Met with resistance and skeptics and negativity Transition Implementation time	13 15 4 5 4
3	Different screens/views Steep learning curve but better with time System challenges Individuals reaction	6 7 9 4
4	Increased stress Decreased stress No change	7 1 6
5	Increased error System challenges Access and communication	6 16 9
6	Improved quality of care Increased access to more patient information	14 7
7	More efficient Documentation logistics	14 7 4
8	Improves outcomes System benefits	12 8
9	Impacted attitude towards work Empowerment No change	12 5 6
10	Team division/friction Individual perception of affect impacted team Improved team communication/awareness	6 7 6
11	Training insufficient System problems More individualized/specific training	4 5 8
12	System challenges Team impact Administration and user disconnect	9 4 8

The themes that emerged were: individual aspects, system components, patient care, team dynamics, training, and implementation. These are presented in Table 4.

Table 4

Theme Table

Theme	Codes associated
Individual Aspects	Individual perception of affect impacted team Positive impact on my work Increased/changed role or work Impacted attitude towards work Empowerment No change Individuals reaction Increased stress Decreased stress
System components	Different screens/views System benefits Steep learning curve but better with time System challenges/problems More efficient Documentation Logistics
Patient Care	Inaccurate data Decreased time with patients Increased error Access and communication Improved quality of care Increased access to more patient information Improves outcomes
Team Dynamics	Team division/friction Individual perception of affect impacted team Improved team communication/awareness Team impact
Training	Needed in-clinic specific and ongoing training Steep learning curve but better with time More individualized/specific training Training insufficient
Implementation	System challenges Team impact Administration and user disconnect

	Transition Implementation time Decreased time with patients Met with resistance, skeptics and negativity

Results

Perceived documentation system change themes that emerged from the interviews were: individual aspects, system components, patient care, team dynamics, training and the implementation. Each theme is discussed in the following sections and quotes from the participants are included. The quotes are labeled with an "I" to signify interview and then a numerical number to show which interviewee, for example (I2) would be Interview 2.

Theme 1: Individual Aspects

After review of the transcripts, it was clear that the way in which each individual dealt with change affected how they dealt with the new system. I8 and I13 mentioned that they had learning disabilities but there were no accommodations, thus making the ability to adapt to the new system more difficult. Seven of the participants perceived that older individuals who did not grow up with computers also struggled more than younger, more computer savvy individuals. Each individual expressed different feelings about the new system although those with similar job roles appear to have similar feelings. User job roles potentially affected how they received the new EMR system and to what extent it affected them. Overall, it seems that the participants' perception of their ability to deal with change and their adaptability ultimately influenced how they adopted the new system. Participant I2 stated that

> There are some people that seem to have enormous trouble or difficulty adjusting to it and they are uncomfortable with each and every step and that if you have no confidence in the system or in yourself that you will learn the system and use it to your advantage then it is easier for you to fail and get frustrated.

I6 stated, "I love this system" and I7 stated that he was "happy to have a more advanced system" while I15 stated,

> In the beginning it was actually more time consuming and it was more difficult to use, but over time I have gotten into an organizational pattern of how I do things and since doing that it has been better, definitely.

This showed that impact on individual members of the team were slightly different. Some found it easy from the beginning while others found it more challenging. However, it appeared that those who readily adjusted to the new system personally liked it in the end and had a smoother transition.

Five participants noted that they perceived that the older members had a more difficult time adjusting to the new system. This could be due to their discomfort with technology and computers as evidenced by I1 who said, "Those that were computer savvy it was easier for them and those that were not it was much more difficult." I13 stated, "I was in my 40s already and I didn't grow up with computers." Some of the members even knew colleagues who quit or retired early due to the change. I13 and I11 both mentioned they knew people that had quit after an EMR was introduced. The age and/or comfort with computers came up several times in many of the interviews. It could reflect a bigger change for older members and more experienced members as I2 stated

> It has to do with computer knowledge or computer literacy and so if you grew up with it you won't find it that complicated and if you have had little exposure or decades of professional life with charts that require dictation then this is a much bigger change.

I8, who was an experienced team member, stated, "everyone dislikes the system, older and more experienced people more so."

Seven participants felt that the system was tough in the beginning but got easier as they got used to it. Examples of this were statements like, "there was a lot of apprehension and anxiety about implementing the system" (I14) and that the system "was more difficult to use but over time I have gotten into an organizational pattern of how I do things and since doing that it has been better, definitely" (I15). The participants had different feelings and experiences with the system. While some were positive, as noted in quotes above, others stated, "I type a lot more" (I2) and that "it increases my stress level in clinic during the day because time is definitely an issue and you want to be on time for your next patient and if you are struggling to get orders in for a patient and that patient needs a print out for the next visit it slows you down" (I14).

Three out of the four physicians mentioned negative feelings after the implementation. I2 stated, "I basically started feeling guilty towards the patient," "getting under pressure because it eats away at your clinic visit time". I15 mentioned similar feelings when she stated that, "I felt a little bit bad for the patients that were there because it took so long to get anything done." I8 stated, "I want to do a good job and one of the major problems is the system". I14 stated, "I feel like my clinic visits are more

pressured" and "I have actually had to adjust the amount of time I give my return visits to adjust for that" because "It was just too time consuming."

Ultimately, it seemed that how the participants adapted to the same system depended ultimately on their willingness to adopt a new system. I11 described her observation of the transition as

> A really big change and it is scary and it gets brought up a lot in jobs because if you aren't tech savvy and not all people are comfortable going in and exploring and figuring out what they can do.

I2 also mentioned a similar thought in her interview, "there are some people that seem to have enormous trouble or difficulty adjusting to it and they are uncomfortable with each and every step." I7 described his smooth transition to the new system, "it was a standard change for me. I think all of us have to expect change and expect a little hiccup." I11 and I13 both mentioned that they new people that changed jobs or retired early because they did not want to change or did not like the EMR system. A transition to a new system affects the health care team members in different ways.

Theme 2: System Components

Nine participants brought up that new system increased the accessibility and the increased ease in finding patient information. Six people brought up that the system had different views (screens and information available) for different job roles. Some people felt that it was too busy, complex and confusing. There were both positive and negative comments about the same aspects of the system by different participants.

The system was credited for increasing access and availability of patient information. I1 stated, “The new system is easier to find the physician’s documentation” and “I only have to look in one place and I know exactly where it is.” I3 said “It is useful and organized and easy to access information.” Other comments were, “I find it overall helpful when reviewing patient charts” (I2), “It is all in one place so I kind of like that better” (I4), and “I can access it remotely which is a big advantage over older paper systems” (I8). Many people felt that it made them much more efficient; I10 stated, “It has made it easier for us, saved us more time and it is very easy.”

The different screens used by different professional roles also showed a trend. I1 found it especially frustrating, “everyone has a different view so when the doctor tells me where they see it that is not where I see it.” I1 added to this thought later in the interview by mentioning, “the other thing that I think creates some stress and is difficult with this one is that all viewers depending on their role have a different view”. This participant as well as several others brought up this challenge.

Three participants mentioned that the system was too busy and complex. Two even felt that this caused them to get confused and make more errors. I1 stated, “This particular EMR that we use is too busy” and I7 stated, “very over-engineered and elaborate”. However, 6 participants felt just the opposite and had similar statements to I6, who stated, “it is easier to view and more simple.”

One participant stated that, “the system is not intuitive” (I1). This could be a reason why I8 who was very dissatisfied with the system made several comments about the system - “It is terrible, to be specific the use of smart phrases is garbage in and

garbage out," "too difficult to access in an accurate way so you find something that is close and you just push the button so that isn't accurate either," "very user unfriendly," and "It is very inefficient." I14 felt that, "The search engine for the system is really poor, you need to put in exactly the right term or else you don't find it." I14 and I15 felt that the system made challenging cases and situations more challenging because the system is hard to individualize and adapt to specific, complex or out of the ordinary patients and situations.

Perceptions of the actual system had positive and negative feedback. Out of the 15 participants interviewed, 6 felt that the new system improved communication. I15 was frustrated with the fact that, "there are certain things that take a little more time than they should and in a real life situation as opposed to when they designed it initially." Most of the technicians (I3, I4, I5, I6, I7, I10, I11) felt the system was great, gave them more access to patient information and that it was more efficient for them.

Theme 3: Patient Care

Eleven out of 15 participants felt that the new system improved patient care because of the increased accessibility to information, increase in efficiency, and improved communication. The ones that felt it increased it stated it was due to the flow sheets, the inability to leave unfinished charts, the increase in communication, and the increased ability to get patients to surgery more efficiently. However, there were a few concerns about the aspects that could affect patient safety. Six participants felt that new system increased the chance of error, 6 participants felt that the new system decreased the chance of error and 3 felt the new system had no impact on the chance of an error.

Thirteen out of 15 participants felt that the system increased patient care by improving accessibility of patient information. I1 stated that, "they can see immediately what the MRI was, the medication, the tried and failed, the specific types of seizures at a glance. So I think that would make it better", and I2 felt that, "I think I deliver better care now". Several people mentioned that it improved communication and the timeliness of communication. I10 stated, "We communicate better and we are all on the same page so we can all see a mistake quicker than before. I think there is a decreased chance of error" and, "We used to have to wait, now it is less time because he can authorize it from any room, so it is much better." The improved timeliness was thought to improve the quality of patient care. I12 felt that the system "improved quality of care because the services were provided in a more timely manner."

Medical errors still remain a serious concern. The participants were divided regarding the likelihood of the system decreasing or increasing their chances of making an error. I12 stated that, it was "less likely for error because you have access to more detail", and that "I think it would be less error personally, you have a better way of checking what patients present with, what medication the patient is on, whether they really have the imaging that you think is appropriate." I13 felt that there would be "less error because you aren't trying to transcribe someone's penmanship." I14 felt that it decreased errors due to the standardized after care instructions that could be printed and handed to the patient. I3 mentioned that, "I think it avoids error so long as information is put in correctly from the get go."

Others felt that it increased the likelihood of errors because of inaccurate data, difficulty with medication reconciliation, distraction, and frequent system use. Inaccurate data are a real concern because so many of the participants said that they felt that they knew more about the patient because of increased access to data; however, if the data are incorrect then that would lead to a lot of people possibly relying on the wrong information. One provider was very adamant that it was very difficult to chart accurate data and several of his concerns were based around "inaccurate data" (I8). The system has safeguards but one provider felt that "There are a lot more errors. There are these built in safe guards but they are much more outweighed by the shortcuts. I don't know if the orders are there or not" (I8). Another interviewee felt that people utilizing the system so much led to, "people are using it as second nature that they would follow instincts and they wouldn't be aware of the changes so errors would be made that way" (I7)

Two of the providers were concerned about the medication reconciliation. "The medication reconciliation is a tricky system because if I try to update a patient's use of a particular medication it changes their orders for the pharmacy. This can be a problem for other providers that might be prescribing a drug," "if it doesn't get reconciled just right when they get admitted they can end up with adverse events" (I14). Another provider also was concerned about the medication reconciliation process, "I think there have been some patients where the medication list said something and that wasn't exactly what they were taking" (I15) and also mentioned concern about patient safety.

Another concern that participants had about the new system was regarding the time it took away from patients. A provider noted that, "during the actual clinic visit I

am typing the entire time other than when I am examining the patient" (I14). Another stated that, "they expect physicians to do a lot of things on the system which I think is wrong because my job is to spend as much time as possible with the patient and gather information and educating them, now I am fighting with the computer and it is no good" (I8). Another clinical person felt that it was a real problem when, "sitting there charting you tended to have blinders on to the rest of what was going on. You were so focused on trying to figure it out that you spent your mental energy on that instead of seeing the rest of what was happening" (I13).

Overall, the participants felt that the quality of care was improved. I2 stated, "I think I deliver better care now." I11 felt that quality of care was increased because, "I think that everyone digs deeper in the system than they did before because it allows you to see more stuff." Nine out of 15 felt that access to information improved quality of care as explained by I3 stating "It is easier to access information and anybody can access it and you don't have to go looking for a chart."

Theme 4: Team Dynamics

Team dynamics was another theme that emerged from the data. Several participants really felt that the new system improved team communication that lead to better care and work environment. Several providers and supervisors felt that the documentation system led to team division between those that adopted the new system and those that did not.

Six out of 15 participants commented on how much the system improved the team communication. Some of the effects of the improved communication mentioned were

that they felt the increased communication led to better patient outcomes, increased quality of care, more knowledge among all members of the team and decreased chance of errors. I15 stated, "I do think it has helped with team communication" and I3 said, "Communication has improved." Four out of 15 participants felt that the system helped with communication between the different roles, I1 mentioned that, "my ability to send a note to a physician is easier," and I3 said "It is easier to pass information along."

The division in the team was between those that embraced the change and those that did not. Those that did not embrace the change mentioned that it was due to not wanting to change, lack of computer comfort and literacy, and not liking the system or feeling that the system made more work for them. I2 stated that "the most frustrating thing is not myself but the people not using it and therefore are not participating in the data collection efforts." I15 noted that, "there are some people who do better with it and some people who don't do well with it." I1 mentioned the friction that it caused in the team by stating, "Three quarters of my team embraced it and the other quarter resisted it which creates some friction."

It was also evident that the older, more experienced members had to rely on younger members for their computer experience. I8 noted, "everyone dislikes the system. Older and more experienced people more so." I13 stated that she "had to have an attitude adjustment" due to having to ask the younger nurse for help when she was a seasoned and experienced nurse. She also noted, "there is a skill mix, the younger people took it on a little easier so they had to have some understanding and appreciation for where people were in their life and in their career." I2 stated she observed that if you

"grow up with it (computers) you won't find it that complicated and if you have had little exposure or that decades of professional life with charts that require dictation then this is a much bigger change." Five participants noted that they had to rely on coworkers for training on the new system.

Theme 5: Training

The training of the participants to use the system was something everyone mentioned in the interviews. It was a very common theme that this group wanted more specific training and more face-to-face training. Several participants mentioned that they had to rely on other co-workers for help. Many felt that the training they were provided was not adequate and a few participants felt that the training was a waste of time. A few felt that the training was adequate and well done.

All 15 of the participants mentioned that they wanted more specific training. I11 felt that "because our department is so small I don't think we get a lot of individualized attention but that might have helped more." There were several comments that had to do with specific one-on-one and in clinic training. I3 suggested that it was important to "have a person do training and have it by department because everyone has different requirements on how to do things and what they have to do." I4 felt that the "training wasn't really for us." I11 thought that the lack of specific training could lead to errors and stated, "because we didn't get the individualized help in the beginning there could have been more chances of error." Many participants mentioned that it would have been very helpful to have a person present during the initial clinic visits. I1 mentioned that the training, "needed to happen in the clinic when they were seeing patients and when they

encountered the issue" and I3 stated that, "someone actually showing me rather than learning modules" would have been helpful. I8 mentioned that in the training, "they could have spent ten minutes what it took hours to do, because it wasn't focused on our specific needs." I5 said there was a need for "more specific training on particular screens." It was a very common trend that they wanted more specific training for their role and their department.

Another common trend that emerged was the training done by co-workers for each other. I3 stated that, "several of my fellow employees had to show me how to do things the right way" and I1stated that a lot of the training was, "a lot of word of mouth as in coworkers would learn something and then pass it on to each other". Some people did not seem to mind while others felt that, "a professional trainer or someone that could capture certain points and train us on a portion of the class would have been very helpful rather than someone in the team" (I9).

I12 felt that "they did a good job with the initial training but as we brought new staff on they kind of let our specialized training fall by the way side" and I9 felt that "I don't feel that my training was adequate". I13 was frustrated that they had to go through the training because they already had experience while another was upset that they did not go through the training. All participants agreed that there needed to be more specific training and that "you can't really do a one fits all teaching session because mine is different than the next person's" (I5).

Theme 6: Implementation

Individuals' perceptions of the how the new system might affect them, what they heard about the system, and how they thought the change was going to influence them affected how the health care team initially accepted the new system. The system was "universally received with a lot of skepticism and concern that it would actually increase the workload during clinic and after clinic visits" (I2). However 7 people felt that in the beginning it was a big adjustment but that with time they saw positive aspects of the new system. I12 stated, "initially it was a learning curve but I think it is very useful now." Twelve people felt that the implementation was sufficient. Some felt that it was implemented suddenly while others felt that they had ample warning. Everyone agreed that how the system was implemented affected how it was received but they disagreed if their system was implemented well.

Like many new initiatives, EMR is harder to utilize until users are familiar with the system. This could have influenced how the participants felt that the implementation was done. I13 compared this group's implementation to another system with which she had experience and felt that the other system was done much better because of the increased staffing, super users (staff members that are more knowledgeable with the system and have had increased training), and increased personal support. All of the participants felt that one-on-one training would have helped.

The timing of the implementation was another topic where this group disagreed. A few people felt that it was done too quickly. I15 stated that, "I felt like it was basically overnight where you had a little bit of a session that showed us some stuff but that was

actually wasn't overall helpful because it is not until you are actually doing it that you sort of realize what it is like" while I11 stated that, "we were pre-warned so we knew that it was going to change" and that, "I think it was well received because we knew it was coming."

Most people felt that those who implemented the system "did a very good job" (I12) and that the implementation was done, "sufficiently, I don't know how else you would have implemented it" (I7). Others disagreed. I8 stated, "it is a bad system that was badly implemented" because "the people in power have no idea of reality."

The support for the system during implementation and after was also something that 7 participants talked about. Five participants agreed that they had sufficient technical support during the implementation but after the initial implementation they did not have adequate technical support. I6 stated that, "If you have anyone to help us right away we like it. Whenever I need some icon it would be better if they responded faster. Better support. I called the guys and I haven't seen it yet. I called but they haven't helped yet". The fact that they currently had such a slow response to questions and requests was frustrating to many.

Research Questions

The codes and themes helped address the research questions for this case study. Each of the questions is listed below with the themes and codes that addressed it as well as a brief discussion. More discussion can be found in chapter 5.

Research Question 1: What does a health care team experience when a documentation system changes?

From the data, it was clear that most participants felt a range of positive and negative experiences during the EMR change. Almost all the themes helped to address this question. There were individual aspects, system components, patient care aspects as well as mention of the training and implementation. The positive comments were better communication, organization, and better access to patient information, better reminders, more convenience and more efficiency. The negative aspects were the team division, frustration, concerns about patient safety, and the increase in difficulty for older/experienced staff that are not as computer savvy, technical frustration, anxiety, apprehension, skepticism and concern. Many people had opposing views on the smart phrases (short cuts in the system), standardized patient information, the accuracy of the data, the complexity of the system and the time spent. The variations may correlate with provider role, experience, and time spent with the system, however a larger population must be studied to determine this.

Research Question 2: How does a documentation system change affect the stress level, chance of medical errors, and quality of care rendered of a health care team?

The themes that addressed this question were mostly the individual aspects and the patient care. The individual aspects were where the codes about how the participants' stress level was affected and the chance of medical errors and quality of care emerged into the theme of patient care. There are three parts to this question. The participants were almost evenly divided between the system increasing and decreasing their stress level. The reasons for an increase in stress level had to do with time constraints, more pressure, technical difficulties, and inability to do the job well. Most participants noted

that their stress decreased with increasing comfort using the system. The decrease in stress came from the system making it easier to find patient information and the ability to be more efficient.

The study participants were also divided regarding the likelihood of the system to increase or decrease the chance of error and 2 participants felt it did both. Those that felt it increased the chance of an error felt it was from the system being too complicated; becoming too reliant on what is in the system rather than actually examining the patient; too many pop up messages and alerts that they ignored; unclear smart phrases; not enough specificity of the system to allow accurate collection of data relative to the specific discipline; and medication reconciliation problems. The reasons that participants felt that it decreased the chance for an error were that there were more checks and alerts, better communication among team members, more continuity of care (e.g. better transfer of information during a "handoff" when the health care team changes shifts or the patient is referred to another department), and not having to interpret handwriting.

Participants' perceptions of how the change in EMR system affected the quality of care was very divided; 7 participants thought the system had increased quality of care, 2 thought it decreased it, 2 were unsure and 3 felt that there was no change. The ones that felt it increased it stated it was due to the flow sheets, the inability to leave unfinished charts, the increase in communication, and the increased ability to get patients to surgery quicker. The ones that felt that the system decreased quality of care stated that it was due to increased provider strain, increased distraction away from the patient, and inaccurate data.

Research Question 3: Does a documentation system change affect the users' attitudes about hospital efficiency?

Most study participants (11 out of 15) felt that the new system improved their efficiency. The themes that addressed this question were patient care, team dynamics and individual aspects. The statements that the codes emerged from that addressed this question were that many participants felt that the new system made them more efficient due to improved communication among the team, better patient information access, flow sheets that standardized documentation, and changes that the providers were forced to make.

Research Question 4: Does a documentation system change affect the users' attitudes about patient outcomes?

Twelve of participants felt that the system positively affected patient outcomes. One person answered that it negatively affected patient outcomes, 3 did not know if it affected patient outcomes and 1 felt that she could not compare the new system with the old system and did not have enough information to answer. The theme that addressed this question was patient care. The codes that addressed this question were: increased access to more patient information, increased error, decreased error and Improves outcomes. The codes came from statements about medication challenges, improved communication, alerts, quality improvement, after visit print outs and inaccurate data.

Research Question 5: How does a documentation system change affect the users' attitudes about the quality of care they provide?

Five participants felt that the new system had a positive effect on their attitude, 4 felt that it had a negative impact on their attitude and 6 stated that the documentation system created no change to their attitude.

After analyzing the responses, I found that everyone had very different reasons why it did or did not affect their attitude. The theme that addressed this question was individual aspects and the specific codes were positive impact on my work, impacted attitude towards work, empowerment, and no change.

Research Question 6: How does the way the system is implemented affect the team's acceptance?

All the participants except I7 agreed that the way in which the system was implemented affected the team's acceptance. I7 thought it was sufficiently implemented and that there was not much impact because he did not have much need or time utilizing the system for his role. The 15 participants had multiple thoughts on different aspects of how the implementation affected the team's acceptance; some participants had multiple causes and therefore there are more than 15 responses. Seven participants mentioned that they needed more specific training to their role or their department, 4 mentioned that they were trained by co-workers, 5 stated that they needed in clinic one on one help during the initial implementation, 3 stated that the different views were a problem and 3 felt the implementation was great. A few of the participants commented on different aspects of this topic. The perception of the effect of EMR changes on the team dynamic was roughly split with 5 participants feeling that it divided the team and 8 feeling that it was really good for the team's communication and 2 feeling that it did not have any impact on

the team. The overlap is that a few participants noted several of the aspects that addressed this question.

Evidence of Trustworthiness

Trustworthiness was established in this study by accurately reporting the participants' interviews by transcribing their interviews word for word and having them review it for accuracy. Verbal pauses and words like "you know", "like" and "um" were not transcribed for readability. Having participants review the transcriptions ensured that these were true representations of what was said and what they truly felt. The recordings and transcripts are kept in a secure folder in my office and on a password protected computer based on research protocols and in accordance with the privacy protection security guidelines. Another way that trustworthiness was established was through the demonstration of how the codes emerged into themes. This was clearly documented in the tables.

Credibility is the internal validity of the study (Shenton, 2003) and was established by doing a clear informed consent, interviews and participant checks, and validation (Morrow, 2005). For this study the credibility was established by good technique and validation by the interview participants through email of the transcription as well as face-to-face verification of accuracy.

Transferability was established in this study by documenting the exact procedures of the study and a clear method of how the codes and themes were developed. Demonstrating and clearly explaining the steps I followed showed rigor and increased

transferability. This way other researchers are able to determine whether these results can apply to them or use them to do further research.

Dependability is the reliability of the study (Shenton, 2003). Reliability is increased when the operations of a study, such as data collection, can be repeated with similar results (Yin, 2014). Dependability/reliability was established in this study by utilizing good technique for interviews by following the same format every interview, not allowing any persuasion or researcher opinion to influence the interview, and by accurately documenting and transcribing the interviews (Morrow, 2005). The interview, data collection, and analysis procedures are also well documented (Yin, 2014).

Confirmability is the presence of objectivity in the study (Shenton, 2003). Confirmability was achieved by first acknowledging that the data were not objective and secondly adequately tying the findings with the analytic process and maintaining a way for a reader to confirm the adequacy of the findings (Morrow, 2005). Confirmability was established in this study by utilizing a theoretical framework, transcribing the complete interviews, and having the study participants check the transcripts for accuracy.

Discrepant Cases

Most study participants discussed a range of positive and negative experiences during and after the change. Only two study participants felt only one way in relation to the change; I8 expressed all negative comments while I6 described all positive experiences. I8 was an older provider that really did not like the electronic system. He was convinced that it took too long and created accuracy problems. I6 was an older technician that loved the new system, she felt that it really improved her efficiency and

stated numerous times that she "loved it". These two participants were much more passionate and opinionated about the change than the other 13 individuals interviewed.

Summary

This chapter details the process of data collection, data analysis including the codes and the process of theme development, and the results. Themes emerged from codes which were from participants' verbatim responses. The pilot study was discussed including the changes that were made as a result of the findings. The data analysis was discussed with a step by step account of how it was done. The themes that emerged from the codes were individual aspects, system components, patient care, team dynamics, training and implementation. The discrepant cases were discussed and evidence of trustworthiness was explained. The results and how they answered the research questions were discussed.

The findings showed that the health care team is affected by a change in the EMR system and that most participants felt a range of positive and negative experiences during and after the change. How a system is implemented greatly impacted the team's acceptance. All participants agreed that more specific and ongoing training was needed. Twelve of the participants agreed that access to patient information was greatly improved after the EMR change. Only two study participants felt only one way in relation to the change; I8 expressed all negative comments while I6 described all positive experiences. The major concerns were that there was a slight increase in the potential for medication errors, it took time away from patients, was harder for those who were less computer savvy, and the system was not specific enough.

In chapter 5, more information will be discussed regarding the data collection, analysis and highlights of the findings. The discussion of the results, the limitations of the study, recommendations for how these finding can be utilized and how they can create positive social change will be found.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this study was to examine health care team members' perceptions of how an EMR system change affected their stress level, attitude, quality of care delivered, and chance of making errors. I developed the interview questions to elicit responses to my research questions. The participants were those who had experienced an EMR change at a large hospital in central Colorado. The six themes that emerged were: individual aspects; system components; patient care; team dynamics; training; and the implementation. Overall, the majority of participants stated that that the new system was useful, helped them access to patient information, and helped them provide better care and communicate with other members of the team. Participants were concerned that the new system took longer to become fully utilized than the old system. They also had concerns related to patient safety and the amount of specific training and ongoing support they received.

Findings from this study showed that an EMR change does impact the health care team, both positively and negatively, and can present patient safety concerns. These safety concerns are presented as the potential to enter inaccurate patient data, medication errors, and miscommunication due to inaccurately entered or missing information. The way the system is implemented does affect the health care teams' perception and adoption of the new system.

It was clear that how each individual dealt with change affected how he or she dealt with the new system. The majority of participants felt that the system improved

accessibility of patient data and communication, both with each other and patients. Most participants felt that the new system improved patient care because of the increased accessibility to information, increase in efficiency, and enhanced team communication. Several participants felt that the new system improved team communication, which lead to better patient care and an improved work environment.

Interpretation of Findings

The interpretation of the findings are divided into the theory of change, documentation systems, effect on staff efficiency and productivity, documentation system concerns, documentation system benefits, documentation system implementation, provider satisfaction, how EMR system change affects the health care team, and hospital efficiency.

The Theory of Change

The theory of change is a theory in which a rigorous participatory process is followed so that stakeholders clearly understand the desired outcomes, the steps needed to achieve the outcomes, and the indicators of success (Taplin & Clark, 2012). The ToC is a mapping or building block process that (a) identifies long-term goals; (b) maps the process backwards to work out requirements and interventions required to achieve the goals; (c) identifies assumptions that exist and articulates rationale for why the outcomes are necessary; (d) finds the best strategic interventions to achieve the desired outcome; (e) develops clear indicators of success; (f) has a quality review process after that ensures plausibility, feasibility, and testability of outcomes; and, (g) has a written narrative to summarize the logic of the plan (Taplin & Clark, 2012). The ToC is utilized in many

circumstances. I used this theory to develop the questions and in the analysis. I looked for participants mentioning ideas like "buy in," "wanting more say," or "not knowing why they did" something. These are points that utilizing the ToC are shown to measure stakeholder involvement.

After interviewing this health care team, I found that many of the participants described frustration with not having a say in the system, its set up or implementation, and not knowing why the hospital administration decided to change the systems. It is at this point the steps of the ToC could have helped ease these frustrations by creating a framework where the administration would obtain their "buy in." Subsequently following the steps of the ToC could have increased the stake holders' understanding and potentially led to a smoother adoption of the system. It seemed that the members who were still struggling were missing why the system was implemented. They also wanted more say in what was happening, and in decision-making.

If hospital administration had utilized the steps in the ToC there could potentially have been more acceptance by the users, because they would know the end goal, the reasoning for the choices, and be able to have more say in the implementation. This could have alleviated a lot of the frustrating factors for this group. Utilizing this theory is something that could be implemented in the future to help a new system transition.

Documentation Systems

The literature showed that health care workers are faced with many more challenges than just providing good patient care (Munyisia, Yu & Hailey, 2011). Many of those interviewed agreed with this. Three people mentioned that they felt they had

more pressure and were doing more in their role than before the EMR change. One person stated that he wanted to do a good job providing care but felt that the EMR system created a barrier for him to do so.

Hillestad et al. (2005) and Lau et al. (2012) also stated that if EMR were broadly adopted, they would lead to major health savings, with the intent to reduce medical errors, improve patient health, increase health care and practice efficiency, increase medical data access, and increase productivity and care coordination. The data from this study showed that most people agreed that there was an improvement in patient health care and efficiency after the EMR implementation. All participants agreed that it increased data access and care coordination. Conversely, there was an even division of those that felt that it increased errors and those that felt that it decreased a chance of errors.

The challenges for implementing electronic medical systems are the concern for cost, the time to set up and learn the new system, the concern for keeping medical information private and the maintenance of the system (Ferris et al., 2009). Most participants agreed that it was a difficult learning curve and took time to become proficient and get back to the efficiency level they had prior to the implementation; however, most said that once it was established, it was a good thing.

Effect on Staff Efficiency and Productivity

Staff efficiency and productivity is also becoming of utmost importance in health care but it is unknown if electronic documentation systems will reduce staff time spent documenting patient information (Munyisia et al., 2011). Kerber et al. (2011) predicted

that EMR would also increase process utilization and aid in billing efficiency. The technicians in this study felt that the system greatly increased efficiency. The physicians' perceptions were mixed regarding efficiency; some felt that they were more efficient after the initial learning curve, while others felt very strongly that they had a decrease in efficiency with the EMR system. The nurse felt that her efficiency was increased due to being able to transfer patient information. Those in supervisory roles detailed that efficiency increased due to increased team communication and ease of finding what information they needed in the chart.

A fully functioning EMR system can make staff more efficient by alerting them to needed vaccinations, medicine interactions, and allergy alerts. Additionally it can make the medical data more accessible, allowing for easier collaboration (Ferris et al., 2013; Morton & Wiedenbeck, 2009; Shekelle, Morton & Keeler, 2006). During my interviews, participants felt that the alerts were a safeguard that was supposed to protect from errors, but in reality they were mostly ignored due to their frequency. Some felt that the medication system was a problem and there was a high risk for making medication errors.

Munyisia et al. (2011) found that the success, efficiency and receptivity of the system are dependent on how the EMR system is introduced and the specific individual software system. All of my participants agreed that the way the system was implemented, specifically the training, affected how the system was received. One person mentioned that their coworkers' perceptions affected her perception of the new system.

In some clinics and hospitals, users found the systems to be frustrating and inefficient (Munyisia et al., 2011). Fox (2013) found that providers felt that EMR created more clerical work, decreased face-to-face patient time, and degraded the accuracy of medical records due to the templates that often need to be chosen prior to seeing a patient. Several of the providers interviewed explained this exact frustration. Two stated that they typed more and one felt that she was typing the entire patient visit. Several providers stated they felt frustrated, pressured, and that it did decrease face-to-face patient time. One stated that he felt that the accuracy of the medical records decreased while two others felt that the template based program assisted them in gathering thorough histories.

Gastaldi et al. (2012) pointed out that hospitals are being pushed to do more with less. This situation creates increased stress and pressure on the staff, in particular, when an EMR system without good implementation is forced upon them. The participants agreed that the way the system was implemented, the initial training, and ongoing training as well as support greatly influenced their perception of the system. Almost all of the participants agreed that a more specific system and specific implementation would have been very helpful and increased satisfaction with the system. Several people mentioned that the lack of on-going training and continued technical support is an issue.

Documentation System Concerns

Some of the other concerns with implementing an EMR are the complexity, cost of the startup, maintenance, privacy, training, and the equipment needed (Ferris et al., 2009). During the interviews, several participants mentioned that the system was too

complex, over-engineered and elaborate. No one mentioned concerns about the cost, privacy or equipment. These topics may be more pertinent to hospital administrators.

According to Fox (2014) and Kerber et al. (2011), a documentation system also may decrease patient interaction, unintentionally act as a check-list, change clinical decision making, and increase health care administrative time. Several providers mentioned that the new system did decrease patient interaction. One provider felt that the template or flow sheet did create inaccurate data, but three others liked it and felt that it made documentation more thorough and consistent. No one brought up that they changed their clinical decision making due to the new system. A few people felt that it took more time to do administrative tasks than before the new system was put into place, but several technicians felt that it made their job easier and faster.

Another concern from the literature was that there could be a breach of patient information security (Gastaldi et al., 2012). There is no research to support whether it is beneficial to the patients' health care, the health care staff, or if there is actually a cost savings when implemented (Gastaldi et al., 2012). In this case study, no one brought up any concerns about patient information security or any thoughts about the backups.

Documentation System Benefits

The benefits of EMR are that they have the potential to address challenges such as issues with quality of care, safety, efficiency, cost containment and access to health care (Munyisia et al., 2011). Several participants perceived that their new EMR system did increase quality of care, efficiency, and safety, while others disagreed about safety and efficiency. No one brought up any thoughts about cost containment. Everyone agreed

that the new system increased access to health care information. EMR can enhance quality of care by increasing the ability to build evidence-based protocols, view and evaluate practices, increase collaboration, and share patient information (Pera, Kaur & Rao, 2014). Two participants brought up the fact that they could do quality improvement research easier with the new system.

EMR can increase safety by decreasing the likelihood of handwriting interpretation errors, establish automatic allergy and medication interaction alerts, and the availability of the patient record to be seen by collaborating medical providers (Pera et al., 2014). One participant noted that there were fewer errors then when she had to decipher handwritten orders and notes. Two participants mentioned that the alert system helped with error reduction while two others stated that the alerts did not help due to there being too many and were ultimately ignored.

Munyisia et al. (2011) suggested that, during a documentation system introduction, the success depends on other factors such as speed of the system, users' familiarity with the system, speed of typing, and comfort with technology. Several participants raised this topic. Four of the participants felt that they had struggled with adoption of the new system due to their lack of comfort with technology. One person who was really struggling to adopt the system stated how much trouble they had typing and that they were always "fighting" with the computer. Multiple people stated that they did not grow up with computers and so it was a bigger change for them than the younger staff members. One unexpected component with this is that experienced staff members had to rely on the younger members, which created a unique team dynamic. Three

people mentioned that they got frustrated and it really slowed them down when there were system performance issues, printing problems, or trouble booting the system up. Almost every participant mentioned that this system had a steep learning curve. Some felt that they were just starting to utilize the system to a greater capacity after several years of using it.

EMR use is also predicted to increase the ability to efficiently record, retrieve and share medical information which will increase the ability for members of the health care team to collaborate and access patient information (Munyisia et al., 2011). This was the most common benefit of the new EMR system for this group. Everyone, including I8 who was consistently negative about the new system, felt that it really helped to improve access to patient information and charts. Even those who struggled with the system agreed that the ability to access patient data from different geographic locations was very helpful.

Documentation System Implementation

There may be resistance to change in health care staff due to past changes that increased workload, pressure, and did not improve health care practice (Cheater et al., 2009). Several of the more experienced members in this study stated that the system was met with skepticism, anxiety, and apprehension due to fear that the new system would increase workload, pressure, and increase the job requirements. Now that the system is implemented and they have become familiar with it, only a few of the providers felt that it increased the workload. Several of the providers used the term "pressure" to describe how the new system impacted them, due to the increased time requirements, necessity to

finish charts quickly, but most agreed that it did improve their practice. One even stated that she now offers much better care, one stated that she is more organized now, and two stated that they are now forced to get their documentation done.

Many methods of EMR system training have been tried including web-based, remote phone, classroom, EMR functionality, case-based, role-based, process-based, mock-clinic, and "on the job" (Dastigir et al., 2012). Most participants commented that the classroom setting and training that they received was inadequate and they did not feel it was specific or helpful to them. Almost every participant asked for more specific, mock-clinic, and "on the job" training. Dastigir et al. found that a program led by physician expert peers was the most effective for decreasing health care staff resistance. Many of the participants in this case study felt that they had to rely heavily on co-workers and that they would rather have had a professional trainer. It was also found to be of great importance that seeing a high volume of patients during training was very difficult and resulted in insufficient learning (Dastigir, et al., 2012). Three participants mentioned that it was very helpful to see less patients during the initial phases of the system implementation which allowed more time to document; however, several providers still felt very guilty about the time it took to see patients during the initial weeks of system implementation.

Provider Satisfaction

It has been well documented that physicians' perceptions of how satisfied they are with their career is a strong indicator of a nation's health care system (Tyssen et al., 2013). Most of the physicians felt that they provided better quality of care with the new

system with one exception who felt that the new system decreased the quality of care. Additionally, the heath care team is more likely to be satisfied when they have more professional control and autonomy (Tyssen, et al., 2013) but many documentation system changes and choices are made and implemented as authority innovation decisions with little or no health care provider or staff input (Hotchkiss et al., 2012). Almost all the participants commented that the system is not specific enough for their role or department. One person noted that those with the authority to make decisions and those designing the system did not take the time to get to know the users well enough to create a system that worked for the users.

In the past, physicians' acceptance of EMR was a challenge and EMR implementation became a major contributor to physician burn out and career dissatisfaction making successful implementation of an EMR difficult (Sittig et al., 1999). Several of the participants noted that they knew people who left or retired early as a result of the EMR system. Sittig et al. mentioned that when physicians were surveyed, they stated that the screen design, layout, and capabilities were of the biggest importance in an EMR. Although this issue is from an older study, it was still pertinent in this study. Many of the participants noted that they were frustrated with excessive screen clutter and the system complexity. They felt that they did not know or utilize the system's full capabilities. In a more recent article, Ferris et al. (2013) noted that health care workers were more willing to adopt an EMR, but the extent of adoption is what indicates if the users will be satisfied. Partial adoption of an EMR system led to concerns with safety, decreased efficiency, and higher dissatisfaction. In this study, several participants noted

that partial adoption created team friction, frustration and led to concerns about being able to gather accurate and complete data.

How EMR System Change Affects the Health Care Team

Change in health care is a constant. How the change is disseminated and implemented can have a big impact on the success, the resistance and the adoption of the new system (Cheater et al., 2009). This study demonstrated that an EMR system change does affect the health care team. Most of the study participants felt that there were positive and negative aspects of the change. One wondered why it had to change so many times and another was happy to have an updated system. With so many people experiencing different emotions and perceptions, it would be hard to implement the system in a way that would satisfy all stakeholders, however, further work in this area may establish an optimum methodology that would maximize acceptance.

Hospital Efficiency

Hospital efficiency is very important and is an aspect of health care that is being examined more frequently by administrations (Barnum, Walton, Shields & Schumock, 2009). It is of great importance to streamline care for all patients while not decreasing the quality of care (Bach, 2013). This was not a topic that the participants brought up even when asked about efficiency. For the most part the technicians felt that the system made their job much more efficient because they had access to so much more information and they did not have to look for charts. Some of the providers agreed that the system made their jobs more efficient, while others felt that it made them much slower.

Limitations of the Study

This study had several limitations. Anderson (2010) stated that qualitative research has some limitations including that the data have a higher likelihood of researcher bias affecting the results; the quality of the research is greatly dependent on the researcher; it can be difficult to articulate, demonstrate and maintain scholarly rigor; analysis and interpretation can be time consuming; and subject concern over anonymity and confidentially can alter responses. Additional limitations specific to single case study research is that there is a risk of losing methodological rigor and increased researcher subjectivity due to small numbers of participants (Yin, 2014).

Specific to this study, limitations were that only one small medical group and one system was examined. The results from this study may not be applicable to different groups and disciplines. There is bias due to the fact that I am a health care professional who experienced a documentation system change in the past; however, the study group was from a different discipline, in a different hospital, and used a different documentation system that helped mitigate this bias.

Recommendations

This is the first study in which the perceptions of all members of a health care team regarding the change of an EMR system and its effect on the entire health care team has been examined. This was studied due to the potential risk of burn out, increased stress, loss of moral, likelihood of error or decreased patient care due to an EMR system change, which could present a public health risk. After an extensive literature search, it was apparent that there was a literature gap regarding this topic.

A recommendation for future research would be to examine different departments, systems, and specialties to see if similar results are obtained. Expanding this work beyond this specific discipline and in to multiple facilities should further help health care policy makers, administrators and individuals in a health care team design, choose, and adopt better systems as well as provide a better implementation and training. Another future topic that should be researched is the difference in acceptance based on age, learning disabilities, education level and role. This information could aid training coordinators and implementers help all members of the health care team to have adequate training and a positive transition to a new EMR system. The third recommendation for future research is regarding the actual system, and what changes could be made to improve acceptance and decrease the health care team's concerns that the system created patient safety concerns. Further research should be conducted to determine if there actually have been errors regarding the medication reconciliation, which could lead to a major public health concern due to patients getting the wrong medication. The study presented here showed that the way the system change is implemented affected the team's acceptance. Future research could further define the specifics, such as if a change in systems changes efficiency, errors, morale and more clear definition of what the health care would like in system development, training and implementation, to help give more clear guidance to those designing an implementation.

Implications

Social Change

This work affects social change because the results could be used when administrators of health care facilities make changes to an EMR that result in a more effective, efficient, and more satisfied medical group which will lead to better patient care and better quality of health care. Understanding the process of change and enabling factors has the potential to support and increase efforts to successfully implement electronic health records (Takian, Sheikh & Barber, 2014). This case study could help health care administrators start to change the way they think about the needs of the health care team and how they prepare for a system change. This could result in more research which could help create a faster, more cost effective health care system with a more satisfied group of providers and staff, and healthier patients. The data from this study, and future work along these lines, can add to the growing awareness about the effect of documentation system changes on the health care team. In the future and after more research this could potentially impact the way that policy makers and administrators decide and implement a documentation system.

Results from this study could help other groups, policy makers, and administrators help health care teams have a better transition to a new electronic documentation system. The results from this study showed that the system, the way it is implemented, and the individual team members' perception about the system affect the entire team. In this study, the team perceived that their communication, patient information access and efficiency improved after time after the new EMR system;

however, they felt there were several aspects that could cause errors. There was a question of accurate patient data due to not being able to put in specific patient information and accurately manage patients' medications.

Several themes emerged in the study including that the system was too complicated, there was not enough individualized attention to this small department, and the training was insufficient and not specific enough to adequately help them. Many people wanted one-on-one training during the implementation in clinic. Several members felt that the ongoing support for the system was not adequate after time and their needs were not being met. These aspects could be easily addressed by administration learning and meeting the needs of the health care team prior to implementation and by the system designers, trainers and ongoing technical support to work with the specific users. By looking at this data and helping design a better system and a better implementation plan the health care team potentially would have a better transition, be more satisfied, feel less frustration and there would be less concern for patient safety and errors.

Conclusion

The United States health care system is changing; health care efficiency is more important than ever and electronic documentation systems are one way that policy makers are addressing efficiency (Ancarani et al., 2009). Often, these documentation system changes and implementation decisions are made by non-clinical people based on parameters other than clinical necessity and therefore, may have the potential to decrease efficiency, patient safety, and quality of care for patients as well as increase the stress and frustration of medical staff (Fox, 2013; Helton, 2011; Kerber et al., 2011). There is no

extensive research on the effect of these system changes on the entire health care team or how to improve the health care team's attitude to adopt these systems.

For this study, I utilized a case study approach to look closely at the perceptions of a health care group that had undergone an EMR change. This showed how important individualization of a system is to the health care team's attitude and adoption of a documentation system change and how much the team wanted to have more involvement and say into the system, its implementation and how much they needed a more specific training and support. The group who participated in this study was greatly influenced by the system change in a variety of different ways.

I found that this group perceived that overall the system increased efficiency, information access, and team communication. Many of them felt that, after some adjustment time, there was a significant improvement to the care they offered; however, others felt that the system created a greater chance of errors and made it difficult to record accurate data. Most everyone agreed that the system was too busy and needed to be simplified. All of the participants wanted more specific and in-clinic training, and better on-going support.

Small changes by the administrators and system designers could lead to better adoption and a more user-friendly system which would lead to better patient care and higher team satisfaction. Further studies are needed to help to identify these changes but the data found in this study can assist in the decision-making, system design, and implementation planning of those in the future to create better adoption of EMR.

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Appendix A: Interview Questions

I asked participants the following questions during the pilot study interviews:

1. How do you feel the new documentation system has impacted you?
2. How was the system implemented? Do you feel the way it was implemented influenced how the system was received? What changes in implementation would have helped the transition to the new system?
3. How would you describe your experience with the transition to the new documentation system?
4. How did the change in documentation systems affect your stress level?
5. Do you feel that the change in documentation systems affected the chance of an error? Why? How?
6. Do you feel the change in documentation system affected the quality of care you offer? How?
7. How do you feel that the new documentation system has affected your efficiency?
8. How do you feel that the new documentation system has affected patient outcomes?
9. How do you feel that the new documentation system has affected your attitude towards work?
10. How do you feel the new documentation system has influenced your team?
11. What changes would you have liked to be seen either with the system, implementation, or transition to a new system?

These are the revised interview questions after conducting the pilot study.

1. How do you feel the new documentation system has impacted you?
2. How was the system implemented? Do you feel the way it was implemented influenced how the system was received? What changes in implementation would have helped the transition to the new system?
3. How would you describe your experience with the transition to the new documentation system? What would have made the transition better?
4. How did the change in documentation systems affect your stress level?
5. Do you feel that the change in documentation systems affected the chance of an error? Why? How?
6. Do you feel the change in documentation system affected the quality of care you offer? How?
7. How do you feel that the new documentation system has affected your efficiency?
8. How do you feel that the new documentation system has affected patient outcomes?
9. How do you feel that the new documentation system has affected your attitude towards work?
10. How do you feel the new documentation system affected or influenced your team?
11. What changes would you have liked to be seen either with the system, implementation, or transition to a new system?

12. Do you have any recommendations on how to address the challenges you brought up or any other thoughts on documentation systems?

Appendix B: Informed Consent Form

CONSENT FORM

Principle Investigator: Carol von Michaelis, RN, PA-C, BSN, MPA [redacted]

Description Of The Research:
You are invited to participate in a research study about a health care team's experiences with a documentation system change and its effects on their perceptions of quality of care, efficiency and morale. The purpose of this study is to gain more information about the effect of documentation change on the health care team's perceptions of quality of care, efficiency and morale. The data collection procedure will be done through an interview that will last no more than one hour; the interview will be tape-recorded and then transcribed by the researcher. After the interview I will meet with you a second time to review your responses to ensure I accurately captured what you meant to say. This meeting will take about 30 minutes. You may decline to participate at any point during the interview and declining or discontinuing will not negatively impact your relationship with the researcher. There are minimal risks to participation in this study. The benefits are that you will be able to add to the growing knowledge about the effect of documentation system change on the health care team, which has the potential to help the medical community as well as the greater good of the public. The researcher is inviting you to participate because of your employment at the Pediatric Neurology group during the documentation system change. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named Carol von Michaelis, who is a doctoral student at Walden University.

Payment:
This will be a volunteer study and no compensation will be given to participants.

Privacy:
Any information you provide will be kept confidential. The researcher will not use your personal information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in the study reports. Data will be kept secure by keeping records on a password protected private computer. Data will be kept for a period of at least 5 years, as required by the university.

Contacts and Questions:
You may ask any questions you have now. Or if you have questions later, you may contact the researcher via [redacted] If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is [redacted]

[redacted] Walden University's approval number for this study is **02-04-16-0320788** and it expires on **February 3, 2017.**

Please keep a copy of this consent form for your records.

Statement of Consent:

I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By replying to this email with the words, "I consent", I understand that I am agreeing to the terms described above.

_____ _____

Participant Researcher