

Transformation of the Electronic Medical Record from Paper to Electronic: A Ground Theory

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Abstract

The purpose of the present qualitative grounded theory study was to explore current leadership views and to determine a theory to promote the need for change from paper medical record system to an electronic medical record system. A current problem facing health care in Southern California is the portability and responsibility of the medical record that a patient can take to different medical facilities in a safe manner and allow appropriate access from physicians and medical staff in a cost-effective approach. Eighteen volunteer participants in Southern California open-ended questionnaires. The data analysis contributed to the development of a theory based on six major themes: (1) apprehension, (2) progress, (3) education, (4) motivation, (5) standardization, and (6) responsibility. The examination of each theme determines the effect that the theme had on the development of change, and on the need for an increase in leadership. Few studies exist in the exploration of the need for leadership during the transformation from a paper medical record system to an electronic medical record system. The results of the study lead to the recommendation for encryption of the electronic medical record and safety through central location allowing portability and accountability. Recommendations for further research were also proposed.

Introduction

The standard format of the medical record system has been pen to paper except for type written Physician dictation. The first need for improvement from this standard format began in 1996 with the establishment of the Health Information Portability and Accountability Act. This act allows an individual to transport his or her medical record system in a safe and secure manner. Regulations from this act caused increased frustration for both the medical staff and individuals who need medical intervention.

The general problem is that health care organizations want to change to an electronic medical record (EMR) but have the fear of infractions from the health information portability and accountability act of 1996. The George W. Bush administration wanted health care to become paperless by implementing an EMR. The cost of change and fear of regulation infractions has stalled the process to implement a change. According to Shwartz, implementation of EMR system could cost hospitals 90 billion but save the hospital 81 billion in annual savings. This would give the community the ability to travel from different medical facilities without building a new medical record. Individuals in health care want to become innovative and move into a paperless system, but the lack of knowledge has caused fear in the idea of patient safety and cost.

The specific problem is that there is not enough information on best practices within the health care industry related to innovation and redesign of health care processes. Change in health care will require strategic planning that will be a key value-added function in health care leadership. Bernhard Sterne one America's first medical sociologist found health care is resistant to discovery as far back to 1628, he found that resistance decreases as the ability for economic gain increases.

Theoretical Framework

Leadership may allow one person to influence another to accomplish tasks that directly or indirectly affect an organization by increasing the organization's ability to be more cohesive and coherent (Yukl, 2006; Clark, 2008). Leader's abilities come from beliefs, values, ethics, character, knowledge, and skill. Leadership may allow a person, through education, and experience, to influence health care professionals to accomplish the objective of transforming a paper medical record system to an international electronic medical record system. Using leadership may direct health care industry to find a cohesive and coherent product that follows the guidelines set in Health Information Portability and Accountability Act (HIPAA). Good leaders are not born but he or she develops leadership skills from desire and self-will. Leaders know that to improve leadership there is a need for continual work and study.

The qualitative grounded theory research study may show that leadership in the health care industry has an important role in making positive change. The health care industry is constantly changing and the need for good leadership through education is important. To maintain an expertise, an organization needs a continual education process and practical experience, maintaining expertise by developing continual education programs, attending seminars, and workshops (Yukl, 2006).

The bases for good research is in the use of rationale logic that comes from general repeatable work of other individuals who has a base on theory that causes generation of additional questions (Salkind, 2003). Bass (1990) states that there are three basic theories an individual can develop to become a leader. The theories are, 'trait theory', 'great men theory', and 'transformational theory'. 'Trait theory' in leadership looks that a leader is not born, but increases his or her ability to lead others from experience. From experience, an individual can

adapt to a situation allowing the individual to be decisive in finding the appropriate tool and an individual to accomplish a task. A leader is energetic, diplomatic, and tactful with the ability to communicate skillfully to others the idea for change. David Straker (2009) states that, “Through behavioral genetics research that twins separated at birth show an inherited ability toward leadership” (p. 2).

‘Great man theory’ gives man the notion that great leaders come from good breeding and are in the upper class. When a situation arises and the need for a leader approaches, a great man may appear from nowhere to show needed leadership. Straker (2009) states that “most leaders were male and a great woman was seen in other areas other than leadership, this may have been bias because most researchers are male” (p. 1). Transformational leadership according to Bass (2008) is the effect that leaders have on followers. He explains that leaders are individuals who show followers the importance and value of completing a task, leaders motivate others to work in a team environment to accomplish goals and not for self-interest (Bass, 2008).

The health care industry requires leadership to be involved in any change process. This is often an accomplishment from top-down, executive administrator through directors, managers, and supervisors to the workforce. The expectation of each level is to complete a portion of a task that drives the organization’s business strategy. Leaders should also remove or lessen any fears of change to make the process easier to accept. Leadership in health care should motivate an individual to desire making changes that may improve the performance of the organization.

Leadership in the health care industry anticipates change through developing strategies to enhance the vision of the leaders toward improving the future, doing this through communication of the vision and motivation of followers to believe in the importance of change in the organization. Kotter (1990) believed an organization needs both management and leadership to

evoke change in an organization (Yukl, 2006). Possessing a strong management discourages change by not taking risks or experiencing innovation. Strong leadership can cause disorder and inefficiency, acquiring both can cause purpose with practicality (Yukl, 2006).

Significance of the research

This study will benefit the medical ensured and medical personnel by maintaining a medical record that will follow the patient and give medical personnel current, accurate medical information of the patient. The drive of the study is to increase the knowledge that will improve a medical record system, which is currently inefficient. The health care costs continued to increase because of fear of change, legal stipulations, and political impasse. Some health care individuals believe that charting on the computer may take more time to complete, may make the health care professional seem distant from the patients, and require him or her to open several screens instead of looking back to previous paper.

Purpose of the Study

The purpose of the present qualitative grounded theory study was to explore current leadership views and to determine a theory to promote the need toward change. A current problem facing health care in Southern California is the portability and responsibility of the medical record that a patient can take to different medical facilities in a safe manner, allow appropriate access from physicians and medical staff, and become cost-effective. Currently, medical facilities have different medical record departments.

Scope, Limitations, and Delimitations of the study

The scope of the study will reflect the ideas, concepts, and theories on electronic medical record by the medical staff and health care facilities. The study used the grounded theory study method. Some bias will always appear; it is important that a researcher keeps his or her personal

and professional beliefs out of the study and relies on the path of the data. Limitations of the study will acquire generalization because of the amount of information available on EMR systems is small.

Information on the EMR system has the bases of opinions and some facts. Limitations to this study will be generalization of time, and budget. Generalization will be in the form of limited sampling in exploration of information on EMR and not meant to be accountable or predictive of a large classification of people as seen in other hypothesis testing studies.

Acquiring information from questionnaires will be limited based on the availability of participants. Time limitation will be in the completion of the study with set time restraints. The process requirement to deliver questionnaires, and analyze data will require an appropriate amount of time. The time requirement to perform a complete adequate study will require more time than is available.

Budget limitation will be in the form of limited funds available to perform a complete adequate study. The fund requirement will be beyond current budget to perform the medical study on the EMR system. Increasing the budget will allow the ability to obtain an in-depth study on the effects of change from paper system to electronic system.

Delimitations are the boundaries of the study and production of threats to external validity. The focus of the study is on the leadership and the need in health care to decrease the fear of change from a paper record to an electronic record. The construction of the study has boundaries within Southern California; the collected data from questionnaires were from health care professionals. The focus of the study is on leadership in health care and on the need for improvement in leadership to conduct the change from a paper system to an electronic system.

Literature review

In February 17, 2009, President Obama signed into law the \$789 billion dollar economic stimulus package under the American Recovery and Reinvestment Act. The hospital will receive an incentive-based payment of two million dollars from Medicare for using an EMR by 2011 with payments decreasing each year until no incentive after 2015. Physicians will receive an incentive for using of an EMR system by 2011. Physicians who do not implement an EMR system will receive a 1% reduction in Medicare payments until 2015. After 2015, the reduction will increase to 5%.

The review and citation of databases are peer-reviewed articles consisting of Internet websites, books, journal databases, and health care articles. Literature reviewed include documentation related to historical overview, advantages, disadvantages, product licensing, technical support, cost, savings, information storage, leadership, and security.

Method

The grounded theory research design is a qualitative technique that uses interactive communication structure through questions asked of health care professionals on information that creates themes and categories. The design of the grounded theory study method allows participants to arrive at a data saturation goal by using broad questions of knowledge from experiences on a specific problem. This technique, allows the participants to provide his or her opinions based on experience in a system that gives to an optimum research method by data saturation. "The grounded theory approach, particularly the way Strauss (1990) develops it, consists of a set of steps whose careful execution is thought to 'guarantee' a good theory as the outcome" (Borgatti, 2012, p. 1).

Grounded theory research study explores the effects of the EMR on health care and the adaptation of medical staff from traditional paper medical record system to an electronic medical record system. In this study, each opinion involved a personal view to determine issues using a grounded theory research method. Data saturation is achieved when no new data is received from multiple open-ended questions. The possibility of not reaching saturation comes from the constant input of ideas according to Strauss. The study involves the comparison of the opinions of the participants surveyed at health care facilities in Southern California.

Population

This study focused on a target population that Creswell (2005) states are a group of individuals who a researcher can survey on a personal level. The target population for the qualitative study using the grounded theory research design is in the participation of health care professionals from Southern California. The list of volunteers composed of physicians, nurses, certified nurse's assistances, medical scientists, information technology members, medical record staff workers, and other ancillary health care professionals.

Survey questionnaires for the grounded theory study were delivered to 25 participants in the health care industry, 18 questionnaires were returned for coding and analysis. Each participant received a consent that informed him or her about his or her voluntary involvement in the survey. Signing the consent is a requirement before becoming a participant in the survey.

Instructions are given to participants that state his or her participation is voluntary and that he or she can withdrawal from the study and any time. Participants are informed that no benefit or penalty is given because of participation. The consent is connected to the questionnaire after coding and analysis of the questionnaire is completed. The two forms are

placed in a locked box for three years until the forms are shredded to maintain participant's privacy.

Survey Questions and Answers

Q1. Is there apprehension in use of EMR system

A1. Responses show some believe that communication and education is vital to promoting a change to an EMR system. Security and potential violation of HIPAA are other concerns presented by the participants.

Q2. Are there delays in progress in the establishment of an EMR to meet HIPPA

A2. The expense and security issues are main points given as views of why many health care professions resist the establishment of an EMR system. Physicians travel to different medical facilities and as noticed by other health care professional, he or she has two to five different passwords to remember. Fear of power failures, hackers, and other possible glitches could decrease the performance of a computerized system.

Q3. Does an EMR require Strategic Planning

A3. Participants gave ways that medical facilities can overcome the cost of EMR besides strategic planning. Responses to the questions gave a collective to the idea that facilities need to investigate the size of the facility, determine what are the needed software platforms, and other requirements for the facility. Another issue was training; the ability to gain a better understanding of EMR is based on improving knowledge of what each software vendor can provide.

Q4. Are there education and technology advancements to decrease fear

A4. Much of the fear of change comes from the lack of assurance of current systems; majority of the participants had questions pertaining to power outages, equipment, and program

failures. The minority of the concerns deal with current regulations and laws. With increased education and assurance, health care professionals have a decreased fear in change from a paper medical record system to electronic medical record system.

Q5. Are there ways to improve patient contact and decrease charting time

A5. To decrease the amount of charting time while improving patient contact involves programs that require less interaction and decrease duplication. Health care professionals need the ability to navigate the EMR with ease. Opening new windows or other sections of the program should not require the health care professional to journey between sections to obtain required information. The use of handheld scanning methods, wireless transfer systems, and handheld computer units allows the health care professional the ability to input needed information and continue personal patient contact at the bedside.

Q6. Can motivation be achieved through incentives

A6. The majority of participants surveyed believe that physicians could be motivated to transform from paper to electronic with the use of incentives. The government of the United States of America currently has an incentive program to help physicians and medical facilities during the transformation. Part of the incentive has a stipulation that the EMR has to meet the requirement of meaningful use.

Q7. Does the EMR meet expectations and decrease medical costs

A7. Currently because of high cost of implementation, only 13 participants believe that the EMR will decrease the cost of health care. Minority of participants, five participants believe that the EMR cannot decrease cost because physicians do not have privileges at every health care facility. Until the EMR is limited to one system, some participants see no change in current practices.

Q8. Will the EMR decrease miscommunication and increase medical safety

A8. The responses to this question had a response of 10 participants agreeing and 8 participants disagreeing. Currently many software developers have shown that manufactures can communicate with each other in producing a universal EMR system. Another belief is EMR will decrease illegible writing but still have issues about typographical errors.

Q9. Will the EMR require a standard format

A9. The responses from the participant survey show that 17 participants agree that in order for the EMR to become universal and meet the requirements of portable and accountable, the medical record would need a standard format. The minority of one participant believes that the EMR may never acquire a standard because numerous vendors in the global market have various products available. Currently several vendors were working to find a common language or program.

Q10. Will biometric devices decrease the need for passwords

A10. One hundred percent of the participants believe that to decrease the current password barrier the use of biometric devices would promote security of the EMR system. Fingerprint or optical scanners could decrease the amount of time the health care professional would spend accessing EMR. The biometric device would decrease the need to remember multiple passwords, this would decrease frustration associated with the EMR.

Q11. Will High-level encryption and medical banking improve the EMR

A11. The majority of participants believe that encryption is necessary and will require high-level security to improve the EMR system. The use of medical banking approach would allow a location to store an individuals' medical information. Minority believe that placing an EMR in a location, as in a medical banking approach, and encrypting the system using the same

principle as in financial banking; would still allow hackers and terrorist the ability to compromise an individuals' medical record. Both sides agree multiple locations would increase the efficiency and the use of multiple layers of security and complex algorithms may improve security measures.

Q12. Who is responsibility for progress

A12. Response from participants agreed 100% that the responsibility for the progress of the EMR should be a shared responsibility between the physician, chief executive officer, and the health care professional. The majority of participants believe that the undertaking of EMR would be insurmountable for one group to accomplish. It is important for health care professionals to have an active role in the progress development of the EMR by having input in the transformation and migration from paper to electronic format.

Q13. What is the participant's profession

A13. Physician participants are internal medicine to general surgeons; all nurses are registered and have five or more years of health care experience in his or her area of expertise. Ancillary participants are from different areas in health care. The ancillary participants range from medical information technologist to physical therapist. Each of the participants submitted answers, according to current views and interaction he or she has with an EMR system. He or she explains how the construction and implication of this system affects his or her ability to give proper health care.

Analysis and Results

Coding systems measure four characteristics in a content analysis research project. The characteristics are frequency, direction, intensity, and space. Frequency requires counting the amount of occurrences, direction determines if the content is positive or negative, intensity

describes the strength or power of the content, and space records the size of the text by counting words, sentences, paragraphs, or space on a page (Neuman, 2006).

The placements of the themes are on a grid to determine commonalities. Each row of the grid has the coded identification, participant's profession, and a box that allows the response to each theme. Three groups (physician, nurses, and ancillary) allowed triangulation of data to increase the knowledge gained from the participant's answers. The triangulation of data may show the thought process of each group in development and implementation of an electronic medical record system. The three groups combine to meet saturation but the individual groups may not reach saturation. Data collection from the participant began with the combining of each response under a study question. The software brings the documents, coding, and theoretical ideas together and allows the user to arrange the data in any order (Gibbs, 2002).

Table 1

Group Triangulation

<i>Participant</i>	<i>Apprehension</i>	<i>Progress</i>	<i>Education</i>	<i>Motivation</i>	<i>Standardization</i>	<i>Responsibility</i>
Physician	5	3	5	5	5	5
Nurse	4	1	4	4	4	4
Ancillary	3	6	8	6	9	9
Agreement	12	10	17	15	18	18

Through the use of an open-ended questionnaire, the participants' pattern of responses disclosed a six core theme pattern. The emergent core themes were consistent with the literature

reviewed that reflect current barriers to the acceptance of change in the format of a medical record system. The following presents the summary of the six core themes:

Theme 1: Apprehension. The first core theme that emerged from the questionnaire responses was the apprehension that health care professionals view during the convergence of the paper medical record to an EMR. The questionnaires provided vivid descriptions of the participants experience with problems relating to the use of an electronic format. Each participant related his or her observations, according to his or her level of interface with EMR. Presentation of apprehension is seen in responses as fear of theft, loss of control, and fear of computers.

Theme 2: Progress. Is essential for transformation to occur, each step is a requirement to promote a change in medical records from a paper system to an electronic system. The participants view progress in the production of a seamless medical record system, decreasing charting time, decreasing duplication of records, dictation in real time, improvements in computer interface, and voice activated charting systems.

Theme 3: Education. Is important in the development and execution of an electronic medical record system. All health care professionals are required to know and understand all regulations and ethical standards that are attached to EMR. The state privacy laws are hampering the adoption of the EMR with restrictions on the transfer of medical information between medical facilities (Hall, 2010). Participants reflected the need for training sessions and general educational course to assist in the function of a software program.

Theme 4: Motivation. Participants responded that he or she believes that motivation to change from a paper system to an electronic system may be directed toward physicians. The incentive declared that a hospital or physician would need to meet a “meaningful use” to receive

the payment (Health & Human Services, 2009; Hiller, 2009; Swiss, 2009; and Jones & Kessler, 2010). The “meaningful use” stipulation requires physicians and health care facilities to use documentation to reflect his or her specialty.

Theme 5: Standardization. This theme had the most response by the participants, to develop a medical record system that will be portable, accessible, and accountable requiring the system to be constructed in a standardized manner. “Confusion caused by non-standardized terminology, lack of regulation and overwhelming financial support explains current state of affairs in health information technology present not only in the United States of America but also worldwide” (Predanic & Predanic, 2009, p. 103). Fifteen participants gave 26 responses toward the need for standardization in the development and execution of the EMR.

Theme 6: Responsibility. Developing and executing a change in a medical record system or any other type of system requires someone or a group to become responsible during the transformation. “Leadership during times of change is among the most important jobs of a leader” (Morrison, 2006, p. 1).

Table 1

Attention to themes will improve transformation of Electronic Medical Record

<i>Theme</i>	<i>Number of Participants</i>	<i>Agree</i>	<i>Disagree</i>	<i>Undecided</i>
Apprehension	18	12	6	0
Progress	18	10	4	4
Education	18	17	0	1
Motivation	18	15	2	1
Standardization	18	18	0	0
Responsibility	18	18	0	0

Recommendations for Leaders

The need of education may eliminate many of the concerns. Leaders need a better understanding of the EMR to improve his or her leadership ability. Stephen Covey (2006) explains that acquiring bad leadership can lead to a bad outcome (Hesselbein & Goldsmith, 2006). Another recommendation of leaders is in the standardization of the electronic health care system. Health care facilities need to work with physician offices, pharmacies, and sister health care facilities to develop a standard in the EMR.

The recommendation to continue the progress toward improvement and security of the EMR requires the use of device that decreases the need for the remembrance of pass codes. Progress may include incorporating a central location to store medical record between different medical facilities.

Suggestions for Further Research

The progress of the EMR presents multiple facets for examination. This study analyzes the viewpoints of past and present medical record systems and the requirement for leadership during the change from a paper system to an electronic system. Further research is needed, investigation, and ways to overcome costs of the implementation of EMR need to be uncovered.

Biomedical devices and other ways to access medical information needs additional research. Examination of different formats need to be researched to find the best format to become standardized. The use of high-level complex algorithm encryption and the interaction of medical banking need better understanding to allow implementation to improve security of health care records. Additional research would examine possible framework that would decrease barriers in the implementation of the universal medical record system.

Conclusion

This qualitative research study using the grounded theory method research design provides information that was reviewed for emerging themes, information, concepts, and constructs. To decrease the cost of health care the promotion of the EMR is a necessity. The current idea is for a medical record to be portable and accountable while not jeopardizing personal information about an individual. To implement a useful universal EMR, current regulations under HIPAA and HITECH need to be reviewed and altered.

Many of the current regulations restrict the ability to produce a usable universal medical record system. Currently the EMR is becoming a major proponent of health care, the progress has been slow and has many barriers that need improvement. Security is the major barrier seen as a deterrent to the progress of the EMR. By implementing a high-level complex algorithm that would be generated by the central computerized system would increase the security level. By moving the location of all EMRs to five strategically placed location may allow easier access of download and upload capabilities. Medical institutions must mirror financial institutions in the collection and reporting of valuable data information. The adoption of EMR in the health care industry may decrease medical errors, adverse drug reactions, and miscommunications. The creation of the universal EMR would decrease health care costs by decreasing the need for duplication of an individual's medical record.

The EMR is important part of the improvement and progress of health care. To implement requirements stipulated by HIPAA requires the implementation of an EMR system. Presidents George W. Bush and Barack Obama have both spoken about the need for EMR implementation in the health care industry by 2014 (Roeder, 2009). The cost of health care

increases each year and the implementation of new regulations cause increase possibility of medical errors.

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