

2018

Strategies for Improving Healthcare Efficiency While Reducing Costs

Jean Calvin Tchatchoua
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Walden University

College of Management and Technology

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Jean Calvin Tchatchoua Mbitcha

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Walden University
2018

Abstract

Strategies for Improving Healthcare Efficiency While Reducing Costs

by

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MBA, University of Phoenix, 2010

MS, University of Benin, 1994

BS, University of Yaoundé, 1991

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Walden University

April 2018

Abstract

In comparison to the European healthcare system, the U.S. healthcare system has lower quality care, higher costs, and covers a smaller percentage of the population. Despite the high costs, the U.S. healthcare system remains dysfunctional. The purpose of this exploratory single case study was to identify the strategies that some healthcare managers in a hospital setting in the midwestern region of the United States use to improve efficiency while decreasing healthcare costs. Complex adaptive systems theory was used to frame this study that included face-to-face interviews with 6 highly experienced healthcare managers. Data were collected from audio recorded interviews and publicly available documents, and the audio recordings were transcribed and analyzed using deductive and open coding techniques to identify themes regarding strategies used by managers to find effective ways for improvement. Three strategies emerged as themes, including improving the accuracy of information and reports, implementing precise and accurate information, and improving quality. The findings of this study may directly benefit healthcare managers and compel positive social change by facilitating successful strategies to improve efficiency and reduce costs. The successful strategies identified in the study might provide a new direction to healthcare managers attempting to adopt new methods. The findings may also contribute to social change by providing solutions that may improve overall organizational performance in a hospital setting.

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Dedication

I would like to give thanks and praise to the Lord, my God, and my savior, who without his grace and mercy, I would not have been able to begin my journey. The completion of this Doctoral Study was possible because of my family for their love and support, my spouse Celestine, and our daughters Francheska, Maureen, and Kyra. I hope to have set the bar and an example for my children to pursue their dreams as I have, and have encouraged them to believe that whatever they want for their lives is within reach.

To my brothers, my sisters, and my friends who have always supported me during this journey. You supported me with your counsel and sometimes silence as I grasped for a deeper understanding of my research topic and struggling to achieve my goals. In the end, you helped me to persevere and triumph. I am forever grateful to all of you.

This Doctoral study is also dedicated to my parents who both, never had an opportunity to receive a higher education but still raised me with the skills of humility, integrity, and transparency, which gave me the ability to be a positive example for my children, my family, and the community. In memory of my late mother, Therese Kamen Mbitcha, who provided me with incomparable love, unconditional support, and the sense of responsibility and compassion. She is still watching over me from heaven. She is the reason why I decided to join the healthcare industry after a career in education. I wanted to provide healthcare solutions to those in need as the causes of her passing still a mystery for us, till today. Also in memory of my late father, Salomon Mbitcha, who for many years, taught me discipline, independence, patience, and hard work. He was and still is a part of many positive actions in my life. I have gone through my journey

knowing that both my late parents are smiling from heaven and are proud of what I am about to accomplish as an actor of positive social change.

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Section 1: Foundation of the Study

The United States healthcare industry is in trouble (Weisbart, 2015). According to the Institute of Medicine of the National Academy of Science (2012), the United States is the only industrialized nation that does not have a universal healthcare system. Adults in the United States are more likely to forgo care because of cost even when they carry health insurance (Ansar, Johansson, Vásquez, Schulze, & Vaughn, 2017; Henrikson, Chang, Ulrich, King, & Anderson, 2017; Zachary et al., 2016). Healthcare quality satisfaction remains very low even for people who have access to health services (Ansar et al., 2017; Zachary et al., 2016). Further, healthcare quality often affects safety because if quality goes down, safety will go down as well (Kennedy, Nordrum, Edwards, Caselli, & Berry, 2015). The lack of care coordination, efficiency, and patient-centeredness that influences quality issues may frighten patients, compounding their reluctance to seek healthcare services (Thomas, Zachary, Helen, & Barbara, 2016).

Patients with one or more chronic and mostly preventable diseases spend more than 75% of all healthcare dollars (Figueroa, Maddox, Beaulieu, Wild, & Jha, 2017). The pricing of healthcare products and services in the U.S. is notoriously complex (Figueroa et al., 2017). In the healthcare industry, supply costs are very different from market prices (Danzon, Mulcahy, & Towse, 2015). In designing the benefit, the insurance provider decides what prices patients pay out-of-pocket for drugs and other products (Danzon et al., 2015).

Background of the Problem

Governments cannot afford to provide unlimited benefits for its citizens by shifting the costs to future taxpayers (Sandelowski, 2015; Sisko et al., 2014). Very few individuals can afford to pay for their healthcare in case of a significant injury or illness (Guemmegne, Kengwoung-Keumo, Tabatabai, & Singh, 2014). Healthcare insurance providers continuously seek to control their risk by excluding high-risk patients and restricting covered benefits (Guemmegne et al., 2014).

The U.S. Congressional Budget Office (CBO) and several researchers have projected that healthcare's share of the GDP will double from 15.2% in 2007 to 31% by 2035, will continue to grow steadily to 37% by 2050, and will reach 46% of the total economy by 2080 (Hatfield, Favreault, McGuire, & Chernew, 2016; Keehan et al., 2015; Sisko et al., 2014). For this reason, policy options to restrain the growth of federal spending on healthcare will continue to attract considerable interest (Keehan et al., 2015). Healthcare managers need to develop strategies to improve efficiency while reducing healthcare costs.

Problem Statement

In comparison to the European healthcare system, the U.S. healthcare system has lower quality care, higher costs, and covers a smaller percentage of the population (Thomas et al., 2016). Despite the high costs, the U.S. healthcare system remains dysfunctional (Frazier, 2016; La Rocca & Hoholm, 2017). The United States spends annually approximately \$9,523 per person on healthcare, which is more than 2.5 times the average paid by the other Organization for Economic Cooperation and Development

(OECD) countries (Abbott, Sutton, & Edwards, 2014; Martin et al., 2016). The general business problem is that the high cost of limited and modest healthcare services jeopardizes the standard of living and the economic security of U.S. citizens. The specific business problem is that some healthcare managers have limited strategies to improve efficiency while reducing healthcare costs.

Purpose Statement

The purpose of this qualitative, exploratory single case study is to identify the strategies that some healthcare managers use to improve efficiency while decreasing healthcare costs. The specific population for the study consisted of six healthcare managers (one medical doctor, one care manager, one nurse manager, one finance manager, one safety and risk manager, and one healthcare administrator) with at least 3 years of experience in successfully improving efficiency and reducing costs.

Documentation, archival records, and interviews with medical managers in a non-profit hospital in the state of Illinois provided sufficient data for this study. Improving efficiency while reducing healthcare costs is a dilemma faced by some healthcare managers. Healthcare managers may use the findings of this study to develop new ways of managing the U.S. healthcare system for improved efficiency while reducing healthcare costs.

Nature of the Study

Qualitative researchers explore and analyze the meanings individuals assign to their experiences and realities. Scholars have argued that qualitative research is of particular value in management scholarship because of the focus on describing and

explaining the human interactions, meanings, and processes that constitute organizational environments (Ary, Jacobs, & Razavieh, 2018; Haslam, Cornelissen, & Werner, 2017; Olasina, 2016). Quantitative research focuses on numbers connected with causal relationships, and hypotheses regarding observation statements, verifications, and predictions (Cronin, 2014). In this study, the identification and quantification of factors and relationships was not my focus. Therefore, the quantitative research method was not appropriate for the study. The mixed method allows researchers to use techniques from the quantitative and qualitative methodologies to gather and analyze data, thereby providing a holistic approach to the the research (Yin, 2014). However, the mixed methodology is time-consuming and has the potential to repeat several processes, complicate the research, and can cause a researcher to take it in different directions. Mixed methods were thus not suitable to promptly achieve my goals for the study. I conducted an exploratory qualitative case study to describe how some healthcare managers have developed strategies to improve healthcare efficiency while reducing costs.

I considered using a handful of qualitative designs (phenomenological, ethnographic, grounded theory, and case study) for my study. In phenomenological design, data collection efforts involve interviews focused on the lived experiences of participants (Holloway, Wheeler, & Holloway, 2016; Sousa, 2014). Phenomenological researchers do not use information from observations and document reviews. This design would have limited the desired scope and depth of description for the study. I therefore, determined that a phenomenological model was not suitable for the study.

Ethnographic research focuses more on collective experiences in a given culture. Researchers often conduct ethnographic studies by observing and documenting a group of people for an extended period of time and then interpreting those observations (Merriam, 2015). A researcher would use an ethnographic and grounded theory design for a research study that was focused on extended cultural examination and derivation of the fundamental guiding theory from the collection of field data (Village, Sarcy, Salustri, & Patrick, 2015). Ethnographic and grounded theory methods were not suitable for this study since I needed a strong case exploration and description. of *rich data* and *thick descriptions* to identify themes. Case study research design involves the use of various sources of information such as document reviews and interviews to develop a detailed description of a phenomenon (Yin, 2014). The use of these sources enables a broad exploration and identification of emergent themes that are characteristic of case study research (Yin, 2014). I conducted a qualitative exploratory single case study to describe how some healthcare managers use strategies to improve efficiency while reducing costs.

Research Question

Research questions for qualitative research are general in such a way as to allow deep exploration of phenomena while nonetheless setting boundaries for known areas of inquiry (Merriam, 2015). In qualitative case study research, semistructured questions permit a broad exploration and rich description of existing events (Yin, 2014). The overarching research question for this case study was: What are the strategies that healthcare managers use to improve efficiency while decreasing costs?

Interview Questions

I used semistructured, open-ended interview questions to persuade study participants to share and explore their experiences and knowledge regarding the problem of improving efficiency while reducing healthcare costs in the state of Illinois. These questions were:

1. What are the primary healthcare cost drivers in your facility?
2. How do you in your position attempt to improve efficiencies in a healthcare setting?
3. What are the strategies that you use to reduce healthcare costs?
4. What have you done specifically to improve efficiencies that resulted in cost saving in your organization?
5. How do you increase outpatients' treatments or surgeries in an effort to reduce healthcare costs to your patients without hurting your inpatients revenues?
6. How do you increase the use of health information technology (HIT) in an attempt to improve efficiency while reducing healthcare costs?
7. What have you done in your organization to reduce administrative and overhead costs?
8. Is there anything else that you think is important to tell me about achieving efficiency in healthcare and reducing costs?

Conceptual Framework

I used the complex adaptive systems (CAS) theory as the conceptual framework in the study. CAS theory was born of the scientific study of complexity (Chiva, Ghauri,

& Alegre, 2014; Rogers, Medina, Rivera, & Wiley, 2005). As organizations open themselves to a multitude of stimuli, change processes will become more complex. According to Ellis, Churrua, and Braithwaite (2017), CAS is a collection of individual variables whose actions are interconnected (relationships), so that one agent's actions changes the context for other agents' actions (self-organization) compelling them to act in ways that are not always totally predictable (nonlinear).

The study of complex systems has emerged in the last few decades from the disciplines of mathematics and physics in three phases involving relationships, self-organization, and nonlinear predictability (Bountis, Johnson, Provata, & Tsironis, 2016; Radde & Hütt, 2016; Sivakumar, Puente, & Maskey, 2018). CAS theory is a multi-disciplinary approach to understanding the behaviors of diverse, interrelated agents and processes from a system-wide standpoint (Peters, 2014). CAS encompass many components and can self-organize and adapt. The interactions of system components are characteristically complex and non-linear and are not easily controllable or predictable in detail (Bountis et al., 2016; Radde & Hütt, 2016; Sivakumar et al., 2018). The interactions also result in unintended effects or unexpected behavior (Peters, 2014). CAS theory was thus suitable for my study of the behavior of a healthcare organization, with a particular focus on determining what strategies work and why others do not, as well as on identifying levers of influence for improving healthcare management (see Sandelowski, 2015).

Researchers can use CAS theory to model the effects of different policy options on the delivery of healthcare services (Sturmberg & Lanham, 2014). The alternative

perspectives offered by CAS theory may better reflect the complex and changing nature of health systems and create new opportunities for understanding and revamping health services (Bishai, Paina, Li, Peters, & Hyder, 2014; Williams, 2015). Under those circumstances, healthcare managers should have a way of thinking about strategic change that matches the complex environments that they have to navigate (Lichtenstein, 2014). CAS theory can help healthcare managers, policy makers, planners, and researchers explore different and innovative approaches to reaching populations in need with effective and efficient healthcare services.

Operational Definitions

I have used these operational definitions of the following term throughout this study.

Accountable care organizations (ACO): A network of doctors and hospitals that share financial and medical responsibility for providing coordinated care to patients in hopes of limiting unnecessary spending. At the center of each patient's care is a primary care physician (Shortell et al., 2014).

Healthcare system: A healthcare system is the total of all the organizations, institutions, and resources whose primary purpose is to improve health (World Health Organization, 2012).

Health expenditure: Health expenditure measures the final consumption of health goods and services plus capital investment in healthcare infrastructure (Li et al., 2012).

The infant mortality rate: The infant mortality rate is the number of deaths of children under one year of age, expressed per 1 000 live births (CDC and National Center for Health Statistics, 2008).

The Patient Protection and Affordable Care Act (PPACA): Also known as the Affordable Care Act (ACA), the PPACA is the landmark health reform legislation passed by the 111th Congress and signed into law by President Barack Obama in March, 2010. (healthinsurance.org, 2015).

Assumptions, Limitations, and Delimitations

Certain assumptions, limitations, and delimitations framed this study. My explanations in this section illuminate potential weaknesses that might have existed and offer readers a manner in which to validate the quality and importance of the research findings. As the primary instrument for this research, I collected data using semi-structured interviews, field notes, and observations to formulate my observations, findings, and recommendations.

Assumptions

Assumptions are unverified facts that researchers take for granted (Merriam, 2015). Readers, researchers, and peers accept assumptions as true or, at least, plausible (Bengtsson, 2016). Making some assumptions about data collection and analysis is necessary when conducting a study. My first assumption was that all participants in the study would provide comprehensive, up to date, and truthful answers to interview questions. My second assumption was that participants were healthcare managers who have successfully implemented some innovative programs within their organization. My

third assumption was that proper recording, transcription, and coding of collected data would take place during the study.

To address the first assumption, I created a safe and open environment for participants to share their experiences and thoughts. By using active listening when participants responded to open-ended and follow-up questions during the interview process, I worked to encourage participants to provide complete and honest responses drawn from their personal experiences. Rubin and Rubin (2012) suggested the use of active listening in conjunction with open-ended and follow-up questions to obtain complete and truthful answers from study participants during the interview process. Insights and perspectives gathered from participant interviews allowed for the triangulation of the strategies and themes I noted during document reviews.

I also assumed that the documents I reviewed accurately represented managerial perspectives on how to improve healthcare efficiency while reducing costs. I kept in mind that participants were physicians and medical managers who have successfully implemented some innovative programs in their organization. Their healthcare programs were aimed at improving healthcare efficiency while reducing costs in their communities. Organizational documents included letters, memoranda, e-mail correspondence, agendas, written reports, administrative documents, and many other internal records. I therefore assumed that the documents offered a faithful portrayal of individual and organizational values and cultural responses to healthcare efficiency and costs.

In this study, I also assumed that the case study method may be useful for explaining presumed causal links between variables that are too complicated to be

captured by survey or experimental designs (see Robinson, 2014). Transcription of qualitative data may introduce inexactness and misreading (Brinkmann, 2014). I alleviated the risk associated with the gathering, coding, and analysis of collected data by adopting and maintaining a systematic and reliable approach to the reduction of data and summarization of findings. My use of computer-assisted qualitative data analysis software (CAQDAS) such as Atlas.ti was critical for the accurate sorting, coding, and validation of collected data organized into emergent themes.

Limitations

Limitations are influences the researcher cannot control that thus mark potential weaknesses in a study (Bengtsson, 2016). Researchers using qualitative methods acknowledge and discuss the shortcomings of their studies with the goal of defining the degree of transferability of findings (Merriam, 2015). Each research methodology carries some intrinsic limitations. Case studies pose challenges partly because the researchers must use creative insight and careful analysis to make sense of and explain observed as well as inferred findings from the data collected.

One limitation of this study was the number of interview participants, which may have restricted the diversity of opinions and perspectives offered. The second limitation was the fact that participants may not have expressed or described *evidence based practices* during their interview. The semi-structured interview allowed both the interviewer and the participant to pursue an idea or response in more detail as it provided participants with some guidance on what to talk about (Strauss & Corbin, 2015). I

appreciated the flexibility of this approach that allowed for the discovery or elaboration of information that was important to the participants (see Mason, 2018).

Another limitation was the fact that technology and circumstances may change and influence the outcome of this study because the findings and recommendations may not longer be relevant. The development of information technology and particularly the growth of the Internet created not only new ways in which researchers can analyze their data but also created whole new areas from which researchers can collect data (Goldberg & Allen, 2015). The case study design allowed the researcher to sample particular documents, artifacts, people, and programs, which are illuminative and provided a great deal of information related to the purpose of the research.

I conducted interviews with a purposive sample of healthcare managers with responsibility for the administration, the management of healthcare facilities, and the delivery of healthcare services in the state of Illinois. When selecting participants, I took into account their unique knowledge and experience in healthcare management. The selection helped ensure a high degree of relevancy for the information gathered. However, the purposeful selection of interview participants also excluded the collection of information and insights from other individuals with unique perspectives and experiences to offer.

Researchers employ case study designs to investigate contemporary phenomena (Yin, 2014). However, a limitation of the case study design is a concern over the generalizability of results obtained from the study of a particular phenomenon because of the small sample size (Wilson, McNeill, & Gillon, 2017). In this study, I have identified

the strategies that healthcare managers use to improve efficiency while decreasing costs. The findings of the study might not be generalizable to other geographic settings. The generalization of the case study can occur to the extent that other researchers can use ideas and methods embedded within the study. In a sense, usefulness may be more important for case studies in the future than for a broad generalization of the results.

Delimitations

Delimitations are choices researchers make to establish the boundaries for their studies (Smith, Males, & Gonulates, 2016). Delimitations are under the investigator's control (Marshall & Rossman, 2016). The researcher set delimitations so that the goals do not become impossibly large to complete (Bengtsson, 2016). The state of Illinois served as the geographic boundary of the study on healthcare costs and healthcare efficiency. Healthcare managers participating in the study were all active members of their healthcare organization. They were knowledgeable and experienced with strategies used to improve efficiency while decreasing cost.

Significance of the Study

Rising healthcare costs are stifling economic growth, consuming increasing portions of the nation's GDP, and putting added burdens on businesses, the public sector, individuals, and families. In spite of sensitive concerns about the detrimental influence of U.S. healthcare spending, information about what is driving spending is deficient (HCCI, 2014). Healthcare managers need a complete picture of healthcare costs in order to understand what is driving them and to find ways to improve the healthcare sector. Learning more about strategies available to healthcare managers to improve efficiency

while decreasing healthcare costs is crucial to ameliorating problems in the U.S.

healthcare system as a whole.

Contribution to Business Practice

Healthcare leaders such as care practitioners, medical service providers, program administrators, health insurers, and the government all bear responsibility for ensuring that healthcare delivery is efficient, appropriate, and cost-effective. Findings from this qualitative case study may enable healthcare managers to identify and describe individual experiences and organizational structures that influence administrative responses to the problems of excess cost and inefficiency. By exploring and describing the forces and frameworks that contribute to reducing costs, while improving efficiency, healthcare managers might contribute to the development of additional strategies that could lead to an improved system of healthcare management. The findings of this study could be used by healthcare to enhance the capability and efficiency of healthcare leaders and organizations delivering medical services.

I have found that there is a lack of research from a system's perspective exploring strategies to improve efficiency while reducing healthcare costs. The findings of this study might contribute to a broadened interest in research on issues regarding healthcare within the research community. The results of the study might interest the stakeholders in the U.S. healthcare system on a system's perspective on the strategies that can be used to improve efficiency and lower costs for insurance companies, patients, patients' advocacy groups, healthcare managers, and healthcare professional associations.

Implications for Social Change

This study marks my attempt to increase professional understanding of healthcare management to achieve an increase in healthcare value in Illinois communities. The data from the qualitative study will allow healthcare stakeholders to perform a comprehensive exploration of the dilemma of efficiency and healthcare costs. Using the data from this study, healthcare managers might influence social change by striving to open new ways of managing the U.S. healthcare system for more efficient care at affordable costs.

Healthcare costs are overwhelming for low-income individuals, exposing them to an insurmountable burden (Cawley, Moriya, & Simon, 2015; Woolhandler & Himmelstein, 2017). Rising healthcare costs adversely influence local governments. Confronted with the need to balance budgets in a weak economy and rising healthcare costs, states might be obliged to endorse cuts to education and social services programs that are vital to communities (Gaynor, Mostashari, & Ginsburg, 2017; Izón & Pardini, 2017; Mello & Studdert, 2016).

Healthcare stakeholders might use findings from this exploratory case study to identify strategies and leadership models that are essential for the efficient management of the U.S. healthcare system. Healthcare managers and medical service organizations will benefit from increased understanding of effective leadership models, and they might be able to apply the knowledge to efforts to improve efficiency while reducing healthcare cost.

A Review of the Professional and Academic Literature

I used the following databases for the literature review: Academic Search Complete, ProQuest Central, Business Source Complete, Emerald Management, Ebsco Host, Medline, PubMed, Google Scholar, and ABI/Inform Complete. The search terms and keywords were as follows: *healthcare cost, healthcare expenses, healthcare expenditures, quality of care, cost drivers, healthcare value, healthcare reform, ACA, healthcare delivery, PPACA, healthcare law, Medicaid expansion, and healthcare systems*. Over the course of the literature review, I found that there was an urgent need to assess the U.S. healthcare system as a whole. Healthcare managers should implement strategies aimed at improving efficiency while reducing costs. The review included 145 articles, government websites, and organizations' publications; 96% of the articles were peer reviewed and less than 5 years old at the time this study is published. The remaining 4% were either non-peer reviewed or will be more than 5 years old when the study is completed.

Application to the Applied Business Problem

Purpose of the study. The purpose of the qualitative, exploratory single case study was to ascertain the strategies that some healthcare managers use to improve efficiency while decreasing healthcare costs. The overarching research question of the case study was to identify the strategies that healthcare managers use to improve efficiency while reducing costs

This literature review includes subsections on the conceptual framework, healthcare costs, factors directly related to healthcare costs, factors inversely related to

healthcare costs, and how to reduce healthcare costs. The United States ranked first in healthcare spending per capita, but ranked 39th for infant mortality, 43rd for adult female mortality, 42nd for adult male mortality, and 36th for life expectancy (Martin, 2017; Murray et al., 2013). Even though U.S. healthcare expenditures were far higher than those of other developed countries, the outcome was worse (Soneji & Yang, 2015). The United States also ranked 28th in male healthy life expectancy and twenty-ninth on female healthy life expectancy (World Health Organization, 2014). As a side effect of the cost burden, the U.S. was the only industrialized nation that did not guarantee universal health insurance to its citizens (Bodenheimer & Sinsky, 2014). The overall picture that emerged from the commonwealth fund national health system scorecard is one of the missed opportunities and room for improvement (Millstone, 2014). Based on the findings, researchers emphasized the importance of policies that take a consistent, whole-system approach to change and address the interaction between efficiency and cost (Schnarr, Snowdon, Cramm, Cohen, & Alessi, 2015).

Conceptual Framework

I developed a conceptual framework to help me understand the context of the study and to focus the literature review (see Christensen, Macfarlane, Pawlina, King, & Lachman, 2016). I used CAS theory as a framework to help be understand the context of the study and to focus the literature review. CAS theory aids researchers in developing systems models to identify key variables and how they are related. The organization of health systems has long been considered by researchers more as an operational and management problem and less a domain for research (Mounier-Jack, Griffiths, Closser,

Burchett, & Marchal, 2014). The above consideration changed with the re-emerging attention for health systems strengthening the demand of policy-makers for facts to sustain their decisions.

The study of CAS theory has emerged in the last few decades from the physical sciences of mathematics and physics in three phases: relationships, self-organization, and nonlinear predictability (Bountis et al., 2016; Radde & Hütt, 2016; Sivakumar et al., 2018). The theory offers new approaches to understanding the behavior of various interrelated agents and processes from a system-wide perspective (Peters, 2014). Frameworks can thus indeed help in clarifying the concept and can, in turn, point to linkages to other concepts, leading to a better understanding of underlying mechanisms, determinants of observed phenomena, or a novel pathway to change (Christensen et al., 2016; Mounier-Jack et al., 2014). The extent of relevant research questions, approaches, and methods in this field are vast, but a recurring element in the way of thinking is to start from a conceptual framework to both frame and construe empirical research (Mounier-Jack et al., 2014).

Managers of healthcare systems globally recognize the need to adapt to accommodate unprecedented changes in population demographics and related increases in the occurrence of chronic diseases. Interactive, person-centered digital tools and services offer a vehicle to promote a more citizen-led, self-care, preventative health, and well-being agenda (Devlin et al., 2016). According to Thokala et al. (2016), health systems play a crucial role in improving health. Well-functioning health systems facilitate achievement of good health by efficiently using available resources. Effective health

systems also enable responsiveness to legitimate expectations of citizens and fairness of financing (Devlin et al., 2016).

By helping to produce good health efficiently, healthcare systems also contribute to economic growth. Some factors influence ways in which healthcare systems achieve good health efficiently (Thokala et al., 2016). These factors include increasing the capacity of both individuals and institutions within healthcare systems, continuity of stewardship, ability to seize opportunities, and contextual characteristics such as path-dependency, socio-cultural beliefs, economic setup, and history of the country concerned (Devlin et al., 2016; Flink, Nilsson, Tistad, Koch, & Ytterberg, 2017). Current approaches to public health economic modeling do not tend to address all of the above factors. Methods for describing and analyzing the complexity of the healthcare system are needed to capture relevant aspects within a model (Squires, Chilcott, Akehurst, Burr, & Kelly, 2016).

A systems approach takes a holistic way of thinking about complex systems and focuses on the interactions amongst entities and between entities and their environment (Squires et al., 2016). By considering one aspect of a system in isolation, there may be unintended consequences, which may make the problem worse. A systems approach is likely to be appropriate for modeling these dynamically complex public health systems; however, the theory is yet to be standard practice for evaluating complex interventions (Devlin et al., 2016; Squires et al., 2016).

A complex system consists of large populations of interacting agents that form a dynamic network. Their collective behavior emerges from the actions of the parts rather

than an imposition by a central controller (Kottke et al., 2016). A complex system displays emergence and self-organization. Therefore, the behavior of the whole is difficult to predict based on the behavior of its parts. Mallick (2016, page. 5) suggested that when studying complex adaptive systems, researchers should ask a set of questions:

- What are the components?
- What are the connections between components?
- What are the states of the components and the system as a whole?
- How do those states evolve and transition?
- What impacts the evolution of those states?
- What are the emergent behaviors?
- How does the system itself evolve?

From my experience as a healthcare manager, I would argue that when studying complex adaptive systems, researchers should also ask the following set of questions:

- What elements are directly or inversely related within the complex system as a whole?
- What are the emergent behaviors as a result of interactions between the isolated variables?
- What do the emergent behaviors communicate to us about the problems and solutions within the complex system?
- Has the system achieved the goals of meeting patients' needs, wants, and demands?

- If the system has not met its goals, does it need to be reevaluated and changed?

Specifically, the emergent behavior arises from the competition and cooperation among the variables, which act in parallel. The emergent behavior does not require a detailed knowledge of individual behaviors. The behavior of a complex system differs from the behavior of its isolated variables; it emerges from the behavior of and interactions between its isolated variables (Kottke et al., 2016). A complex system is adaptive if the variables—as well as the system—strive to reach equilibrium (Ellis, Churruga, & Braithwaite, 2017; Mallick, 2016). A chief characteristic of a CAS is the continuing self-organization that requires the system to be open in a state far from equilibrium, with ill-defined boundaries, sensitive to initial conditions, and involving a large number of non-linear interactions and multiple feedback loops (Ellis et al., 2017).

The dynamics of the isolated variables are functions of positive and negative feedback loops. Uncertainty and limited predictability are inherent consequences of these types of systems. CASs are systems where managers not only interact with the environment but also learn autonomously from their experience and modify their behaviors to adapt to external changes. Managers in such systems are adaptive if the consequences of their actions can lead to a specific value (performance, utility, payoff, fitness), and their behavior is geared to increase this value over a period (Kottke et al., 2016). The CAS theory provided the contextual foundation for this study. CAS phenomena can explain why a small stimulus in a health sector can create significant or

rapid change, or why good inputs and programs may lead to modest changes or unintended consequences (Peters, 2014).

Supporting theories of the conceptual framework. General system theory and complexity theory are both supporting theories for my conceptual framework based on CAS theory. System thinking is an approach to addressing problems following two basic premises, which include looking at reality in terms of wholes, and acknowledging that the environment is an essential part of the system as it interacts with the system (Arif, 2016; Brownson, Colditz, & Proctor, 2017). A complex system is one that includes many other micro-systems, or a network of systems, thus forming a much larger and complex system (Solgaard et al., 2014).

General system theory. Ludwig von Bertalanffy used systems theory for the first time in 1934 to examine relationships between events and components (Carlisle & McMillan 2017; Mupepi, Mupepi, & Motwani, 2018). In this theory, the interactions of the components and the results of those interactions characterize a system (Mupepi et al., 2018; Wilson & Scott, 2017). In general systems theory, researchers give meaning to the input and output of a system and its effects on the overall environment where it resides (Chandler, Rycroft-Malone, Hawkes, & Noyes, 2016; De la Hoz-Correa, Muñoz-Leiva, & Bakucz, 2018; Snyder, Johnston, Crooks, Morgan, Adams, 2017). Knowing one part of a system should give researchers information about another part of a system (Carlisle & McMillan, 2017; Wilson & Scott, 2017). According to Arif (2016)), systems theory is a culmination of components that when linked together are equal to or greater than the sum of their parts and serves well when the system is understood as a whole rather than

the behavior of individual components. Systems theory enables researchers to identify interrelationships and parts of the system instead of individual patterns.

Complexity theory. Complexity theory is a subset of the systems theory that appeared in the literature in the 1930s and 1940s (Chandler et al., 2016). Within the literature of the past two decades, complexity theory challenges traditional management assumptions (De Toni, De Zan, & Battistella, 2016). Health systems are complex. Failing to take this complexity into account will continue to hinder efforts to achieve better and more equitable health outcomes (Adam, 2014). Understanding and working with complexity requires a paradigm shift from linear, reductionist approaches to dynamic and holistic approaches that appreciate the multifaceted and interconnected relationships among health system components, as well as the views, interests, and power of its different actors and stakeholders (Adam, 2014; Chandler et al., 2016). Organizational theorists continue to strive to utilize complexity theory to aid in the understanding of organizational issues (Arif, 2016; Brownson et al., 2017; Pollack et al., 2014).

Contrasting theory of the conceptual framework. The chaos theory is a contrasting theory with CAS theory. While complex systems are fully knowable but reasonably predictable, chaotic systems are neither knowledgeable nor predictable (De Toni et al., 2016). Complex systems are coherent units in a way that chaotic systems are not, involving instead interactions between units (Roberts & Yoshida, 2017).

Chaos theory. Chaos theory identifies a complex system as having some interrelated parts that are dynamic and constantly changing (Lorenze, 1963). In addition to systems theory, researchers also use chaos theory when seeking to explore and expand

the current base of knowledge regarding management behaviors that enhance business effectiveness (De Toni et al., 2016). Lorenze (1963) pioneered chaos theory in 1963, and other researchers have shown that chaos theory is a relevant approach to business and organization management (Le Nguyen & Kock, 2011; Roberts & Yoshida, 2017). While a comprehensive approach to strengthening health systems is not a new concept, the recent surge of interest in viewing health systems as complex, adaptive systems present novel opportunities for synergy and increasing capacity in local communities and organizations (Bishai et al., 2014). Complex systems have acquired the ability to bring order and chaos into a special kind of balance, called the edge of chaos (Le Nguyen & Kock, 2011). The edge of chaos is where the components of a system never quite lock into place, and yet never quite dissolve into turbulence either. The edge of chaos is the one place where a complex system can be spontaneous, adaptive, and alive (Roberts & Yoshida, 2017). Chaos by itself does not explain the structure, the coherence, the self-organizing cohesiveness of complex adaptive systems (Waldrop, 1993).

Healthcare costs. In 2014, the U.S. healthcare spending increased 5.3% to reach \$3.1 trillion (\$9,523 per person) amounting to 17.5% of the national gross domestic product (Martin et al., 2016). With personal healthcare spending (hospital care and professional services), accounting for 85% of total national healthcare expenditures, acceleration in healthcare spending was influenced by increases in hospital care spending (4.1% to \$971.8 billion in 2014) and growth from professional services spending (4.6 % to \$603.7 billion) related to increased utilization of physician and clinical services (Martin, et al., 2016). With the U.S. healthcare expenditures (\$3.1 trillion) at nearly 18%

of the gross domestic product in 2014, researchers estimate waste from unwarranted treatment exceeded \$250 billion (Keehan et al., 2015). The U.S. healthcare system featured excessive prices and price increases as well as the excessive provision of costly services. Both price and quantities were serious concerns (Danzon et al., 2015). The interdependence of price and utilization further complicated strategies to curb health spending. For policymakers, the above concerns meant that a broad approach was needed effectively to curb health costs (Abbott et al., 2014).

Employee contributions to healthcare premiums had increased by nearly 150% in the past ten years (Harris, Wilt, & Qaseem, 2015). The rise in costs had put enormous strain on the family, employer, and government budgets. Although many factors had contributed to the increase in healthcare costs, new drugs, devices, procedures, and tests have been identified as the primary drivers of increased healthcare spending (Harris et al., 2015; Martin, Hartman, Whittle, & Catlin, 2014).

The distribution of liability for expenses across all market stakeholders such as insurers, providers had been for decades the central struggle of the U. S. healthcare spending (Frakt, 2014). For decades, the issue of healthcare spending had been the distribution of liability for expenses across all markets stakeholders from insurers to providers (Wouters, Cylus, & Yang, 2016). Although many Americans benefited from investments in healthcare, the recent rapid cost growth, coupled with an overall economic slowdown and rising deficit, had placed severe strains on the systems used to finance healthcare (Baker, Bloom, & Davis, 2016; Dzau, McClellan, & McGinnis, 2016). Current

trends in healthcare costs were the cause for concern and had led to the ongoing discussion of public policy and current legislation (Reinhardt, 2014).

In a study conducted in 2014, Frakt provided some insights regarding the development of contemporary forms of provider cost sharing, particularly accountable care organizations (ACO). The ACO in effect constituted a search for the best position or the appropriate place on a continuum, between providers and payers on the degree of risk they absorbed (Frakt, 2014). The conception of ACOs was one of the first delivery-reform initiatives implemented under the ACA. The purpose of ACO's was to advance change in patient care to speed up progress toward a three-part aim: better care for individuals, better health for populations, and slower growth in costs through improvements in care (De Voursney & Huang, 2016).

The recession contributed to slower growth in private health insurance spending and out-of-pocket spending by consumers, as well as a reduction in capital investments by healthcare providers (Reinhardt, 2014; Schwed & de Virgilio, 2016). Slower growth in health expenditure during 2009 was influenced primarily by a decline in spending growth for private health insurance from 3.5 % in 2008 to 1.3 % in 2009. The deceleration in spending was because private health insurance enrollment declined by 3.2 %, or by 6.3 million enrollees (Schwed & de Virgilio, 2016). A deceleration in consumer out-of-pocket spending growth—from 3.1 % in 2008 to 0.4 % in 2009—also contributed to the slowdown in overall 2009 health spending growth (Schwed & de Virgilio, 2016).

The recession also placed increased burdens on households, businesses, and governments, which meant that fewer financial resources were available to pay for

healthcare (Martin, Hartman, Washington, & Catlin, 2017; Reinhardt, 2014). Declining federal revenues and steady growth in federal health spending increased the health spending share of total federal revenue from 37.6 % in 2008 to 54.2 % in 2009 (Martin et al., 2014). Although the economic downturn contributed significantly to slower health spending growth, the weight of financing health expenditure increased for households, businesses, and governments as the resources available to pay for that care declined. By the end of 2009, the United States was devoting just over one-sixth of its available funds to its healthcare system (Schwed & de Virgilio, 2016).

The Patient Protection and Affordable Care Act (PPACA) of 2010 set in motion a broad range of programs that substantially affected the health system in the United States and signified a moderate but significant regulatory shift in the role of the federal government in public health (Kerkhoff, 2015). The PPACA brought both the promise and peril of primary care. The PPACA had the potential to reestablish primary care as the foundation of the U.S. healthcare delivery (Lathrop & Hodnicki, 2014). Current trends in employer healthcare costs were unsustainable. Also, public policy changes in the form of the PPACA were tied up in legal review, and the results were uncertain (Reinhardt, 2014).

The PPACA primarily addressed healthcare financing and insurance and established only a few initiatives directly targeting public health (Kerkhoff, 2015). Nevertheless, the PPACA had the potential to produce extensive public health benefits across the U.S. population by improving access to healthcare and services and reducing cost (Kerkhoff, 2015). Primarily, the PPACA did not take the explicit form of public

health law but instead strived to advance public health indirectly through its effects. The PPACA did not establish a right to health or even the right to health insurance in the United States (Béland, Rocco, & Waddan, 2014). The PPACA did set in motion some significant structural and normative changes to the U.S. law that comports with the attainment of the right to health (Kerkhoff, 2015; Reinhardt, 2014).

Two sets of interacting forces, which operate on supply prices and market prices determine what the consumer-patient sees in health insurance contract for medical services or products (Danzon et al., 2015). In general, excessive prices explain why the United States had much higher healthcare spending than other developed countries; whereas, within the United States, utilization explains why some areas are subject to excessive price increases more than others (Abbott et al., 2014; Chandra, Gruber, & McKnight, 2014). Thus, both prices and utilization run the level of health spending, but prices may also fuel utilization (Hoverman, 2014). The increase in health spending seems to be driven by the excessive supply and use of expensive technologies (Angelis, Tordrup, & Kanavos, 2017; Ubel & Jagsi, 2014).

The most intense spenders on health services were considerably less healthy and were elderly. The health status of the elderly was at 49% fair or poor compared to 15% of the general adult population (De Nardi, French, Jones, & McCauley, 2016). Such findings had important implications for addressing national health-care spending because interventions targeting the people who were in ill health could theoretically generate dramatic cost savings (De Nardi et al., 2016; Thompson & Nichter, 2014).

Categories directly related to healthcare costs. From my review of the literature, a number of categories are directly (+) related to increases in healthcare costs. As they go up, healthcare costs will go up; as they go down, healthcare costs will go down. The categories are the following: (a) Inappropriate or non-beneficial treatments, (b) unnecessary administrative expenses/excess costs, (c) Medicaid fraud, waste, and abuse, (d) use of name brand medications versus generic drugs, (e) care coordination problems, (f) hospital-associated infections, (g) preventable medical errors, (h) preventable or avoidable hospital admissions, (i) nurse turnover rate, and (j) drug shortages and drugs in short supply. Where researchers have indicated a range of numbers from the lowest to the highest representing wasteful spending, I calculated their midpoint for potential savings. These ten categories account for approximately \$666.7 billion dollars or 21.5% of the \$3.1 trillion dollars in healthcare expenditures on an annualized basis (Table 1).

Inappropriate or non-beneficial testing/treatments - \$192 billion dollars. A cross-national survey of health systems found that 14% of Americans reported that a physician had ordered a test completed previously compared to 5% in Canada (Himmelstein et al., 2014). The waste that comes from subjecting patients to care that, according to sound science and the patients' preferences, cannot possibly help them. Examples of waste include excessive use of antibiotics, use of surgery when watchful waiting is better and unwanted intensive care at the end of life for patients who prefer hospice and home care (Himmelstein et al., 2014).

However, intensive care interventions often sustain life under circumstances that will not achieve an outcome that patients can meaningfully appreciate. Such treatments are often perceived to be pointless by healthcare providers (Polly, Rebecca, Joann, & Thomas, 2016). Treatment that cannot achieve a patient's goals or that simply maintains a health status such as ICU dependence or permanent coma is contrary to professional values and creates moral distress (Polly et al., 2016). Researchers have estimated that the above category represented between \$158 billion and \$226 billion in wasteful spending in 2011 (Chalmers et al., 2014).

The overuse of tests and procedures because of fear of malpractice litigation, known as defensive medicine, is estimated to cost \$46 billion annually in the United States, but the costs have been measured only indirectly (Rothberg et al., 2014). Defensive medicine, defined as medical practices that may exonerate physicians from liability without significant benefit to patients, can be categorized as either positive or negative (Brateanu et al., 2014; Dineen & DuBois, 2017). Positive defensive medicine occurs when physicians provide excessive and unnecessary diagnostic testing, treatment, hospitalization, or consultation. Negative defensive medicine occurs when physicians curtail services to avoid high-risk patients or procedures (Dineen & DuBois, 2017; Rothberg et al., 2014).

Excess costs and inappropriate or non-beneficial treatment also include a significant amount of money spent on overuse and misuse of diagnostic testing, including screening tests (Cardona-Morrell et al., 2016; Pollard, Moskowitz, Diefenbach, & Hall, 2017). Some diagnostic tests are misused or overused, with waste from diagnostic

imaging alone estimated at more than \$25 billion. At the same time, diagnostic errors are frequent and often result in death or disability (Gupta et al., 2018), with recent estimates suggesting more than a million a year harmed by a diagnostic error in the United States (Schiff et al., 2016). For people hurt, direct costs accrue from failure to treat the true condition, improper testing, and treatments for those persons, who received an incorrect diagnosis, and any medico-legal costs or payments. Indirect costs also arise from defensive medicine, increased medical liability premiums, and downstream effects (Buzzacchi, Scellato, & Ughetto, 2016).

Unnecessary administrative expenses/excess costs- \$180 billion dollars. The U.S. administrative costs absorb an estimated 31% of total U.S. healthcare costs, which are approximately 30–70% higher than comparable countries with mixed public-private systems (O'Kelly et al., 2016; Tran, Zimmerman, & Fielding, 2017). The amount of time and money devoted to administrative tasks is one of the most frustrating aspects of modern medicine. Indeed, for the system as a whole, administrative duties are incredibly costly (Erickson, Rockwern, Koltov, & McLean, 2017; Siddiqi et al., 2017). According to the Institute of Medicine (IOM), healthcare providers in the United States spends \$361 billion annually on healthcare administration- more than twice our total spending on heart disease and three times, our spending on cancer. Also according to the IOM, fully half of the above expenditures -\$180 Billion dollars are unnecessary costs and should be reduced to control the rise in healthcare costs (Lorenzoni, Belloni, & Sassi, 2014).

Although administrative expenses have declined in recent years, they are still substantially higher in the United States (Abbott et al., 2014). According to the McKinsey

Global Institute, administrative costs account for 14% of excess spending compared with other OECD countries (Lorenzoni et al., 2014). Administrative costs are the most significant factor explaining the difference in health spending between the United States and Canada, accounting for 39% of the difference. Insurers in the United States must comply with 51 regulatory frameworks, which add to administrative costs (Lorenzoni et al., 2014).

Similarly, the U.S. multi-payer healthcare system requires separate rate negotiations and administrative procedures for each payer (Grossman et al., 2016) which also increases administrative costs. In the medical sector, the United States has 44% more administrative workers than Canada, 25% more than the United Kingdom, 165% more than the Netherlands, and 215% more than Germany (Himmelstein et al., 2014). The need is urgent to bring the U.S. healthcare costs into a sustainable range for both public and private payers. Commonly, programs to contain costs use cuts, such as reductions in payment levels, benefits structures, and eligibility (Lorenzoni et al., 2014). A less risky strategy would be on reducing waste, not lessening value-added care.

Medicaid fraud, waste, and abuse - \$127 billion dollars. According to Medicare, fraud is an intentional deception or misrepresentation that an individual knows to be false or does not believe to be true and makes, knowing that the trick could result in some unauthorized benefit to himself/herself or some other person. Abuse is a lesser offense than fraud. Abuse usually involves incidents or practices that directly or indirectly cause financial losses to the Medicare/Medicaid program without intentional deception (CMMS, 2012). One significant problem of healthcare is the loss of healthcare

expenditures to fraud, waste, and abuse (FWA). The Institute of Medicine (2012) estimates the annual loss to FWA in the healthcare domain to be \$75 Billion. Healthcare-related programs such as Medicaid, Medicare, and Medicare Part C and D contribute significantly, representing more than half of the total.

The magnitude of the fraud problem has attracted many efforts from the healthcare industry, the data analytics industry, and research communities to develop fraud detection systems (Liu et al., 2015). Medicare fraud and abuse occur as fraudsters issue fake bills and run scams (Thornton, Brinkhuis, Amrit, & Aly, 2015). Researchers have estimated that the waste account for \$82 billion to \$272 billion in spending in 2011 (Chalmers et al., 2014).

Use of name brand medications versus generic drugs - \$70.8 billion dollars.

The World Health Organization (WHO) defines generic medicine as a pharmaceutical product, usually intended to be interchangeable with an innovative product that is manufactured without a license from the innovator company and marketed after the expiration date of the patent or other exclusive rights (Hassali et al., 2014; Howard, Bach, Berndt, & Conti, 2015). A generic medicine is identical to its complementary innovator medicine regarding safety, quality, efficacy, dosage form, strength, and route of administration, and has the same intended use as the innovator medicine (DHHS, 2012; Fox & Tyler, 2017). Generic drugs are clinically interchangeable with original brand medicines and have the same quality, efficacy, and safety profiles (Hassali et al., 2014). They are, nevertheless, much cheaper. Thus, while providing the same therapeutic outcomes, generic medicines lead to substantial savings for healthcare systems (Hassali et

al., 2014). Therefore, many countries promote the quality use of generics (Fox & Tyler, 2017; Hassali et al., 2014). Also, the US FDA, besides ensuring quality, safety, and efficacy of generic drugs via a rigorous registration process, makes efforts to promote generic medicines by educating both consumers and healthcare managers to increase their confidence in generic medicine.

Promotion of generic medicinal products in the United States resulted in substantial savings (about one trillion U.S. dollars) from 2000 to 2010 (Generic Pharmaceutical Association, 2012). Use of branded medications continued to decline in 2011 (Howard et al., 2015); whereas, generic alternatives grew to represent 86.1% of total prescriptions dispensed in 2014 (HCCI, 2014). Several key patent expirations contributed to a reduction of about \$14.9 billion in spending on branded products (Schumock et al., 2017). The total savings in healthcare costs attributed to patent expiration, known as the “patent dividend,” grew to \$65.2 billion since 2007. The growth does not entirely reflect savings associated with patent expiries that occurred late in the year, and more adequately reflects savings from expiries that occurred in late 2010 and early 2011 (Schumock et al., 2017). Spending on branded medications represented 22.8% of total expenditure in the United States (Schumock et al., 2017).

Care coordination problems - \$35 billion dollars. The Affordable Care Act (ACA), along with Medicaid expansions, offers the opportunity to redesign the nation’s highly flawed mental health system (Beronio, Glied, & Frank, 2014). The ACA promotes new programs and tools, such as health homes, interdisciplinary care teams, the broadening of the Medicaid Home and Community-Based Services option, co-location of

physical health and behavioral services, and collaborative care (Beronio et al., 2014). The waste occurs when patients fall through the slots in fragmented care. The results are complications, hospital readmissions, declines in functional status, and increased dependency, especially for the chronically ill, for whom care coordination is essential for health and function.

Chalmers et al. (2014) estimated that the lack of care coordination represented between \$25 billion and \$45 billion in wasteful spending in 2011. Many current proposals to increase the value of care delivered in the U.S. healthcare system focus on improved coordination. Badly coordinated care, duplicated efforts, bungled handoffs, and failures to follow up result in too much care for some patients, too little care for others, and improper care for many (Westra, Angeli, Carree, Ruwaard, 2017). A host of current reform efforts aims to reduce the inefficiencies in both public and private markets. Efforts range from penalizing hospitals with higher-than-expected readmission rates to rewarding primary care providers when patients receive higher-value care, to providing incentives for the adoption of electronic health records (Hsiung & Abdullah, 2015; Westra et al., 2017).

Hospital-associated infections - \$33 billion dollars. Costly healthcare-associated infections (HAIs) account for a significant proportion of the harm caused by inappropriate healthcare (Dancer, 2014; Zingg et al., 2015). Better evaluation of the costs of infections could help providers and payers to justify investing in prevention (Simões et al., 2016). As one of the most common sources of preventable harm, HAIs represent a significant threat to patient safety. Recent estimates of the national morbidity and

mortality burden of HAIs have made it clear that HAIs represent a significant public health problem (Dancer, 2014). Furthermore, a robust body of evidence exists describing interventions that can substantially reduce the incidence of HAIs, and recent analyses indicate that at least 50% are preventable (Zingg et al., 2015).

Many of the HAIs occur in the intensive care unit (ICU) setting and through the use of an invasive device (such as a central line, ventilator, or indwelling urinary catheter) (Simões et al., 2016). The goal of preventing 100% of HAIs may not be attainable even with the use of current evidence-based HAI prevention strategies; however, comprehensive implementation of such strategies could prevent hundreds of thousands of HAIs and save tens of thousands of lives and billions of dollars (Simões et al., 2016).

Standard-setting organizations such as the National Quality Forum have identified HAIs as a critical area of focus for patient safety with the development of a number evidence-based, HAI-specific safe practices. As a target for healthcare stakeholders seeking to improve care in the United States, methods to reduce HAIs represent a crucial opportunity to save lives and reduce costs (Simões et al., 2016). Among the preventable HAIs, preventable catheter-associated bloodstream infection (CABSI) is likely to have the highest associated costs, ranging anywhere from \$960 million to \$18.2 billion annually (Dancer, 2014; Simões et al., 2016).

Simões et al. (2016) estimated that approximately 440,000 infections occur yearly among U.S. adult inpatients and their annual costs are \$9.8 billion. Over a third of the costs are attributable to SSIs, with a quarter due to ventilator-associated pneumonia

(VAPs) and catheter-associated urinary tract infections (CAUTIs) (Simões et al., 2016). Of the HAIs that Umscheid et al. (2011) examined, preventable cases of CABSIs were likely to have the highest associated costs, ranging anywhere from \$960 million to \$18.2 billion annually (Simões et al., 2016).

Investment in leadership, practices, and technologies will continue to drive patient safety and allow hospitals to realize cost savings attributed to prevention of HAIs (Zingg et al., 2015). Ongoing payment reforms such as value-based purchasing coupled with incentives to reduce the frequency of the events should drive local, state, and federal efforts and bring about a substantial reduction in preventable infections that cause patient harm (Kaye et al., 2014; Simões et al., 2016).

Preventable medical errors - \$17.1 billion dollars. A medical error is an avoidable adverse outcome that results from improper medical management rather than from the progression of illness resulting from lack of care (Chalmers et al., 2014). A medical error may or may not lead to medical injury (Weant, Bailey, & Baker, 2014). Hospitals have been looking for ways to improve quality and operational efficiency and cut costs for nearly three decades, using a variety of quality improvement strategies. However, based on recent reports, approximately 200,000 Americans die from preventable medical errors including facility-acquired conditions and millions may experience mistakes (Chalmers et al., 2014).

Evidently, medical errors are a safety issue, and quantifying the magnitude of the problem is a significant step toward solving it (Weant et al., 2014). A few studies have examined medical injury and errors to see how frequent they are, and how much they cost

the U.S. healthcare system (Weant et al.). Van Den Bos et al. (2011) used an actuarial approach to measuring the frequency and costs of measurable U.S. medical errors, identified through medical claims data. Van Den Bos et al. (2011) noted that 10 categories created two-thirds of all Medicare expenses: (a) pressure ulcers, (b) postoperative infections, (c) post laminectomy syndrome, (d) Hemorrhage complicating a procedure, (e) accidental puncture or laceration during a procedure, (f) implant or graft, (g) ventral (abdominal) hernia without mention of obstruction or gangrene, (h) hematoma complicating a procedure, and (I) unspecified adverse effect of a drug or medicinal or geological substance not classified elsewhere. Van Den Bos et al. (2011) concluded that if providers focus on these ten categories, changes will lead to improved patient care. With a careful analysis of these categories of problems, healthcare managers could produce a listing of policies and procedures for staff to follow that would lead to improved patient care. These changes may also reduce medical errors, and reduction of the expenses medical errors bring to the healthcare industry.

Van Den Bos et al. (2011) methods focus on the analysis of comparative rates of illness, using mathematical models to assess the risk of occurrence and to project costs to the total population. Van Den Bos et al. (2011) estimated that the annual cost of measurable medical errors that harm patients was \$17.1 billion in 2008. At a minimum, high-quality healthcare is care that does not harm patients, particularly through medical errors.

Preventable or avoidable hospital admissions - \$9.1 billion dollars. High and increasing healthcare costs are arguably the single most significant threat to the long-term

fiscal solvency of federal and state governments in the United States (Cardona-Morrell et al., 2016; Pollard et al., 2017). One compelling strategy for cost containment is focusing on the small proportion of patients in the Medicare programs who account for the vast majority of healthcare spending (Rogers, Bai, Lavin, & Anderson, 2016). 10% of the Medicare population accounts for more than half of the costs of the program (Rogers et al., 2016). By far, the most prominent sources of spending among high-cost beneficiaries are related to acute care: emergency department (ED) visits and inpatient hospitalizations, which make up more than 55% of costs for the population (Greenberg, Barnett, Spinks, Dudley, & Frolkis, 2014). More than 70% of the roughly \$91.7 billion in acute care expenses in the Medicare population in 2010 was for the 10% of patients that comprise the high-cost cohort. Approximately, 10% of the costs covered potentially preventable causes (Rogers et al., 2016).

Nurses turnover rate - \$2.1 billion dollars. Nurse turnover is a global concern that is both costly for health-care organizations and in the context of the work environment, affects quality and safety (Smith, Morin, & Lake, 2017). Turnover cost components include separation costs incurred by the staff member leaving, temporary replacement costs such as the use of overtime and agency staff, recruitment costs, and induction costs. Induction costs include “lost” productivity until the replacement reaches the same level of productivity as the staff member who had left (Nei, Snyder, & Litwiller, 2015). Direct costs are more visible or tangible, and indirect costs such as the loss of productivity and organizational knowledge are less noticeable or inappreciable. Buchan, O'May, and Dussault (2013) point out that actual turnover costs may vary significantly

between individual employees depending on the grade and experience of the worker and the replacement strategy used by the employer.

Nurse turnover is costly in the form of productivity losses and organizational inefficiencies due to staff instability (Kovner et al., 2016; Smith et al., 2017). Hospitals lose nurse productivity when experienced nurses act as ‘preceptors’ to recently appointed nurses and must take the time to provide a recruit with suitable orientation and support until they reach full productivity. Buchan, O’May, and Dussault (2013) explain that most studies determine the cost per individual staff member turnover and then calculate a total organizational cost per annum. A categorization of annual nurse turnover rates has found healthcare organizations to range from moderate (in the 12– 21% range) to high (in the 22–44% range) (Nei et al., 2015). The rates of registered nurse (RN) turnover on a global basis fall largely in the categories of moderate to high levels (Nei et al., 2015).

Health-care organizations must spend money to replace nurses who leave and to advertise, recruit, and train new nursing employees. Health-care organizations also lose the intellectual capital of nurses who leave and incur potential productivity losses associated with nurse turnover. Gilmartin (2013) estimated the costs of newly licensed RN turnover to be \$856 million for organizations and to range between \$1.4 and \$2.1 billion for society. However, the estimate may be low because it includes only the costs associated with newly licensed RN turnover.

Drug shortages and drug in short supplies- \$0.6 billion dollars. The American Society of Health-System Pharmacists (ASHP) defines a drug shortage as a supply issue that affects how the pharmacy prepares or dispenses a pharmaceutical product or

influences patient care when prescribers must use an alternative agent (Mazer-Amirshahi et al., 2017). Natural disasters might contribute to drug shortages, as well as a lack of available raw or bulk materials, manufacturing difficulties, regulatory issues, recalls of the affected or related products, or changes in product formulations (Mazer-Amirshahi et al., 2017).

The annual increase in drug acquisition costs required to purchase alternative products was \$1 million to the U.S. healthcare system (Mazer-Amirshahi et al., 2017). In a more recent analysis, managers at Premier Healthcare Alliance estimated that the need to purchase more expensive generic drugs or therapeutic alternatives caused by drug shortages could be costing the U.S. hospitals, at least, \$200 million yearly (Fox, Sweet, & Jensen, 2014; Moriates, Mourad, Noveler, & Wachter, 2014). The addition of \$216 million for annual labor costs associated with managing drug shortages exacerbates the economic burden created by drug shortages (Mazer-Amirshahi et al., 2017). When adding the annual labor cost amount, the economic burden created by drug shortages becomes even more apparent. Economic effects, as well as considerable medication safety concerns, are concerns associated with the increase in drug shortages (Fox et al., 2014).

In July 2010, researchers at the Institute for Safe Medication Practices surveyed 1800 healthcare managers to understand better the frustrations and patient safety concerns associated with drug shortages. Clinicians reported increased risks of adverse effects during a drug shortage, in part because physicians may be prescribing an alternative agent with which they are unfamiliar (McLaughlin & Skoglund, 2015). A survey of directors of pharmacy revealed that labor costs and the time required to manage

drug shortages are significant and that current information available to manage drug shortages is considered suboptimal (Mazer-Amirshahi et al., 2017; Moriates et al., 2014).

Summary of categories directly related to healthcare costs. Table 1 depicts the categories, estimated avoidable costs, and percentages. The total cost of avoidable spending exceeds \$666.7 billion and represents 21.5% of the \$3.1 trillion spent on yearly healthcare expenditures.

Table 1

Summary of Avoidable Healthcare Costs and Percentages

Categories	Avoidable Costs (Billions dollars)	Percentage (%)
Inappropriate or non-beneficial testing/treatments	192.00	28.8
Unnecessary administrative expenses/excess costs	180.00	27.0
Medicaid fraud, waste, and abuse	127.00	19.05
Use of name brand medications versus generic drugs	70.80	10.62
Care coordination problems	35.00	5.25
Hospital-associated infections	33.00	4.95
Preventable medical errors	17.10	2.56
Preventable or avoidable hospital admissions	9.10	1.36
Nurses turnover rate	2.10	0.31
Drug shortages and drug in short supplies	0.60	0.09
Total	666.70	100

Note. The U.S. healthcare system's avoidable spending exceeds \$666 billion and represents 21.5% of the \$3.1 trillion yearly healthcare expenditure.

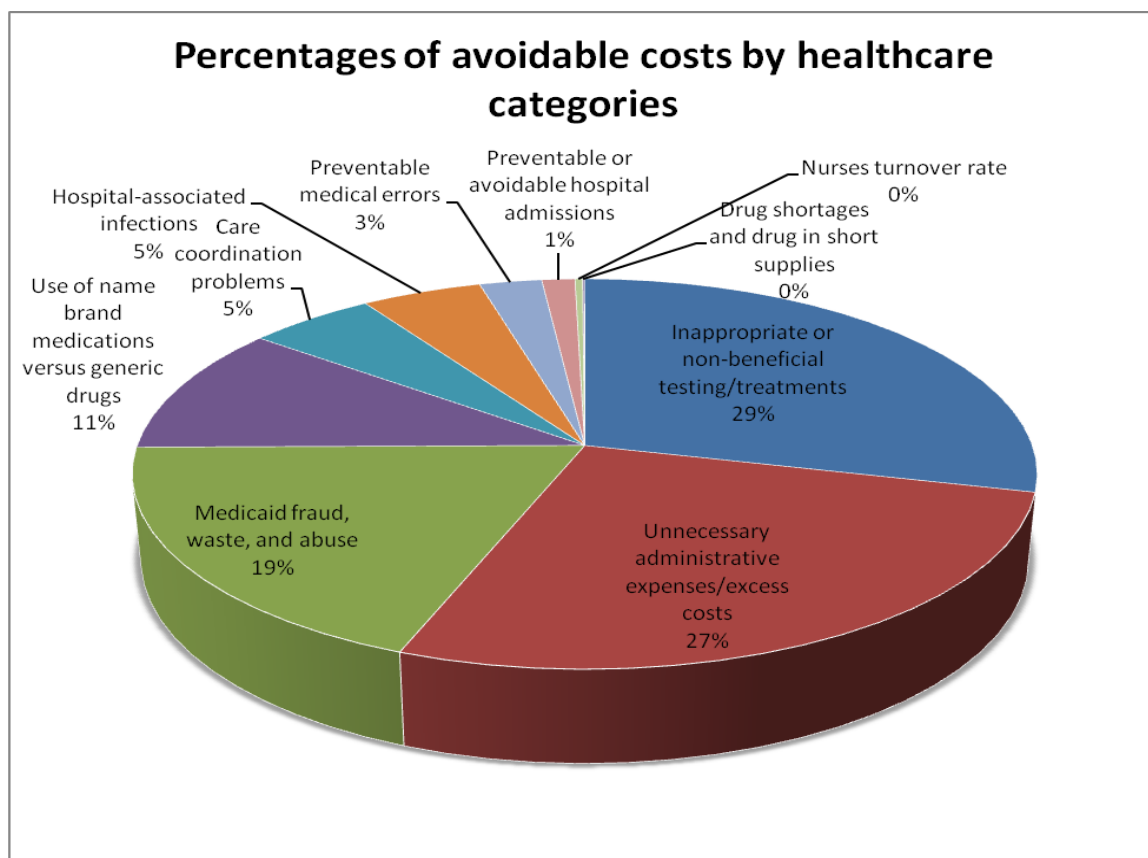


Figure 1. Percentages of avoidable costs by healthcare categories.

Categories inversely related to healthcare costs. From my review of the literature, a number of categories are inversely (-) related to increases in healthcare costs. As they go up, healthcare costs will go down; as they go down, healthcare costs will go up. The categories are the following: (a) health information technology, (b) healthcare literacy, (c) medical tourism, (d) safety and efficiency improvements, (e) use of telemedicine, (f) preventative care, (g), accountable care organizations, (h) outpatient services. Where researchers have indicated a range of numbers from the lowest to the highest representing potential savings, I calculated their midpoint for potential savings.

These eight categories account for approximately \$391 billion dollars or 12.61% of the \$3.1 trillion dollars in healthcare expenditures on an annualized basis.

Health information technology - \$256 billion dollars. The health Information Technology (HIT) literature is expanding rapidly but failing to produce a proportionate amount of useful knowledge (Jones, Rudin, Perry, & Shekelle, 2014). Although, the researchers in most of the studies reported that HIT interventions had statistically and clinically significant benefits, sometimes the benefits were not as extensive as the developers had expected, and sometimes no benefits were noticeable (Jones et al., 2014). Now that healthcare organizations adopt the HIT, researchers should refocus their efforts to show how the HIT can be used to realize value (Schwamm et al., 2017). Against a backdrop of persistently high growth in health spending, many policymakers are looking to HIT as a critical tool to improve the efficiency of the healthcare sector, by preventing medical errors, cutting unnecessary tests, and improving clinical outcomes (Schwamm et al., 2017). The RAND Institute has projected that HIT will spur a \$142–\$371 billion per year reduction in health spending (Jones et al., 2014). EHRs could lower healthcare costs by several means. Electronic prescribing could prevent adverse drug events and the associated cost and access to previous diagnostic test results could decrease duplicative testing (Overhage et al., 2016).

The hope is that EHRs will enable better management of information to improve the quality and reduce the cost of healthcare (Agha, 2014). While an array of studies point to the quality benefits enabled by EHRs, there have been several attempts to use cost-benefit models to quantify potential cost savings, which are assumed to derive from

efficiencies such as reductions in unnecessary testing. Estimates of potential savings also rely on the assumption that healthcare managers will use EHRs to reduce inefficiencies and waste where they exist (Keenan, 2014).

Electronic health records (EHRs) have recently received renewed national attention as a critical tool to streamline patient care, reduce costs, and improve safety (Hsiung & Abdullah, 2015; Overhage et al., 2016). The Center for Information Technology Leadership (CITL) estimates that 13.7% of the time, clinicians order unnecessary laboratory tests just because they do not have access to prior test results (Shen et al., 2015).

The RAND Corporation also cites a potential saving of tens of billions of dollars if EHRs are used efficiently along with appropriate changes in healthcare. Zlabek, Wickus, and Mathiason (2011) estimated that only 8% of hospitals have fully implemented CPOE systems, and tend to be larger, not-for-profit, and teaching hospitals. The hospitals showed a positive correlation between specific quality measures and CPOE implementation (Shen et al., 2015). In 2014, 75% or 3 out of every 4 hospitals in the United States adopted at least a basic EHR system, leaving 1,391 hospitals without a fully functional system to help improve patient care (Keshavjee, Kuziemy, Vassanji, & Ghany, 2013; Kushniruk et al., 2013). In spite of a federal mandate under the HiTech Act and \$30 billion in incentives, subsidies for health information exchanges for purchasing Health Information Technologies (HIT) did not increase implementation of EHR systems (Adler-Milstein, et al., 2015).

Healthcare literacy - \$73 billion dollars. Health literacy refers to an individual's ability to seek, understand, and use health information to make appropriate decisions regarding their health (Sorensen et al., 2015). Because of its relevance and importance to patient-centered healthcare and health reform, health literacy is receiving increasing attention from governments, researchers, clinicians, and patients. Providing individuals with information, and actively involving them in decisions about their health, are critical components of patient-centered healthcare (Truitt et al., 2017). Approximately, 80 million U.S. adults are thought to have limited health literacy, which puts them at risk for poorer health outcomes. Rates of limited health literacy are higher among elderly, minority, and poor persons and people with less than a high school education (Gutierrez, Kindratt, Pagels, Foster, & Gimpel, 2014).

Staff members from numerous policy and advocacy organizations have expressed concern about barriers caused by low health literacy (Haun et al., 2015; Sorensen et al., 2015). In the general population, inadequate health literacy has been associated with an increased need for disease management, higher medical service utilization among older, racially ethnic minorities, and with low educational attainment (Haun et al., 2015). In managed care enrollees, individuals with low health literacy have higher medical costs and are less efficient when using services (e.g., more ER visits) than individuals with sufficient health literacy (Gutierrez et al., 2014; Sorensen et al., 2015). In the Veteran's Health Administration, low health literacy is a significant independent factor associated with increased health costs and utilization. The authors of this study showed that interventions are needed to help remediate health literacy needs and reduce expenditures.

The analysis suggests 17.2% of the veterans account for almost 24% of VA medical and pharmacy costs for the 3-year period. Meeting the needs of patients with low health literacy would produce potential economic savings of approximately 8% of total costs for the organization (Haun, Patel, French, Campbell, Bradham, & Lapcevic, 2015). The costs associated with inadequate health literacy among adults at the national level is estimated to be \$73 billion annually (Haun et al., 2015).

Medical tourism- \$40 billion dollars. Medical tourism is a global health practice where patients travel internationally with the intention of receiving medical services (De la Hoz-Correa et al., 2018; Snyder et al., 2017). The practice of medical tourism raises a range of ethical issues, including potential harms to the patient's home and destination country and also risks to the patient's health (Han & Hyun, 2015). Medical tourists are more likely engage the services of facilitators who may book travel and accommodation as well as link the patient with a medical facility abroad. The facilitators, therefore, have the potential to exacerbate or mitigate the ethical concerns associated with medical tourism (Han & Hyun, 2015).

The growth in medical tourism has not gone unnoticed by healthcare providers with some prominent interest groups and organizations issuing statements and policies to guide both physicians and patients (Guy, Nevins Henson, & Dotson, 2015). Medical tourists find their motivations in lower costs with comparable quality, the accessibility of treatments not approved in the United States, and the avoidance of lengthy treatment delays (Runnels et al., 2014). Medical examination abroad is much more feasible because

of the introduction of more sophisticated data sharing (Uchida, 2015). Medical tourism is expanding rapidly. More than 4 million patients traverse national borders each year (Uchida, 2015). The money not spent in the United States amounts to approximately \$40 billion on a yearly basis (Guy et al., 2015; Uchida, 2015).

Safety and efficiency improvements-\$12.16 billion dollars. From 2001 to 2014, hospitals have worked on a variety of systems to improve their safety culture (The Joint Commission's Annual Report (2015). Nevertheless, serious safety events (SSEs) continue to occur. Such events can lead to increased length of stay and mortality for children and adults receiving treatment in the hospital. As these events are deemed preventable, new interventions are needed. From 2012 to 2015, staff members from the Washington- based LeapFrog group have issued safety reports on all hospitals who have participated in their study on the safety and efficiency improvements. Of the 2,530 hospitals issued a Hospital Safety Score, the following results were reported in 2015:

- 773 earned an A, 724 earned a B, 866 earned a C, 133 earned a D, and 34 earned an F.
- Additionally, 133 hospitals earned the "Straight A" designation, which calls attention to hospitals who have consistently received an A grade for safety since the Hospital Safety Score launched in 2012.
- For the fourth time in a row, Maine claimed the number-one spot for the state with the highest percentage of A hospitals, with nearly 69 percent of its hospitals receiving an A.

- Zero hospitals in the District of Columbia, Alaska, North Dakota, New Mexico, Vermont, or Wyoming received an A grade.
- Due to a significant data update, 46 percent of hospitals changed at least one letter grade.

Safety measures found to be effective included: (a) a variety of tactical interventions were developed for high-risk areas, such as the operating room and intensive care unit, (b) the establishment of a patient safety oversight group with regular reviews of root cause analyses of every SSE, and (c) the sharing of lessons learned across the organization (Brilli et al., 2013). Managers at the Agency for Healthcare Research and Quality (AHRQ) reported that after healthcare professionals implemented the multipronged quality improvement intervention strategies, the number of SSEs declined significantly from an average of 0.9 to 0.3 per 10,000 adjusted patient-days. Also, the length of time between SSEs grew from an average of 19.4 days to 55.2 days, even with an increase in patient volume. Overall, the patient safety culture improved as evidenced by positive responses from staff. 9 percent decline in the rate of hospital-acquired conditions (HACs) from 2012 to 2013, and a 17 percent decline, from 145 to 121 HACs per 1,000 discharges, from 2010 to 2013. Hospital patients experienced a cumulative total of 1.3 million fewer HACs over the three years (2011, 2012, and 2013) relative to the number of HACs that would have occurred if rates had remained steady at the 2010 level. AHRQ managers estimated that approximately 50,000 fewer patients died in the hospital as a result of the reduction in HACs, and roughly \$12 billion savings in healthcare costs were saved from 2011 to 2013 (AHRQ, 2013). \$8 billion of those cost savings accrued in

2013 alone. The potential cost savings were compelling and warrant serious attention by hospital associations, hospital system, and managers.

The 3,700 hospitals that participated in the AHRQ study represent approximately 65.7% of the 5,627 hospitals in the United States. The average savings per hospital as a result of safety improvements was \$2,162,000. When multiplying this by the 5,627 hospitals, the potential savings based on improvements in the reduction of safety deficiencies as measured by a decrease in SSEs and HACs is \$12.16 billion dollars on an annualized basis.

Use of telemedicine - \$6 billion dollars. Tele-homecare is a communication and clinical information system that enables the interaction of voice, video, and health-related data using ordinary telephone lines from the patients' homes in conjunction with home visits (Radhakrishnan, Xie, Berkley, & Kim, 2016). Hospitalizations of nursing home residents are frequent and result in complications, morbidity, and Medicare expenditures of more than a billion dollars annually. The lack of a physician presence at many nursing homes during off hours might contribute to inappropriate hospitalizations (Grabowski & O'Malley, 2014). When switching from on-call to telemedicine physician coverage during off hours could reduce hospitalizations and, therefore, generate cost savings to Medicare more than the facility's investment in the service (Grabowski & O'Malley, 2014).

Telemedicine is an evolving technology pioneered to address that objective by providing improved access to care without compromising quality medical care. The increase in the use of telemedicine is in part the result of the changes enacted by the

Affordable Care Act (Wennergren, Munshi, Fajardo, & George, 2014). By the year 2018, the use of telemedicine services will increase from its current level of around \$230 million per year to \$1.9 billion per year with an increase in the number of patients using the technology to around 3.2 million, up from 250,000 in 2013 (Wennergren et al., 2014). The intent of telemedicine is for patients to use the equipment to self-monitor, and then actively partner in collaboration with healthcare providers to manage symptoms. The evidence to date on the cost and clinical effectiveness of the tele-homecare monitoring is mixed and difficult to interpret as a body of proof (Paré et al., 2013).

While only 20% of U.S. employers offer their employees access to telemedicine services, nearly 40% of U.S. employers surveyed by the corporate risk and financial management company, Towers Watson & Co. said they plan to offer access to such services in 2016, and an additional 33% surveyed said they are considering providing access to these services within the next three years (Pratt, 2015).

In a 2013 study focused on U.S. employers with at least 1,000 employees, Towers Watson predicted that employers could save up to \$6 billion annually; if employees would routinely engage in remote consults for non-urgent primary care. Efficient use of telemedicine services could eliminate 15% of physician office visits, 15% of emergency room visits, and 37% of urgent care visits, according to the study (Pratt, 2015; Wennergren et al., 2014).

Preventative care – \$3.7 billion dollars. The U.S. healthcare expenditure is significantly high, and one way to decrease costs lies in the prevention of disease by mitigating underlying environmental, social, and behavioral health risks (Fisher, Shortell,

& Savitz, 2016). The most immediate progress is likely to come from innovations that safely and compassionately lower health spending by reducing the cost of hospitalization for all patients and its unexpected occurrence for the 5% of individuals who incur half of the healthcare expenditures in the United States (Borson & Chodosh, 2014).

Opportunities include preventing expensive health crises among medically fragile patients, helping patients in late stages of severe illness avoid dying in a hospital, increasing patient flow through hospitals to lower average fixed cost per hospitalization, and reducing hospital readmissions (Aiken et al., 2017; Neuberger & Silk, 2016). Payers and policymakers should support increased use of evidence-based preventive services for the right reasons and with reasonable expectations of their influence on health spending (Thomas et al., 2016).

Preventive services, as well as diagnostic and treatment services, should be judged by their effectiveness in improving health and the resources they consume to do so (Ansar et al., 2017; Neuberger & Silk, 2016; Zachary et al., 2016). Efficient clinical preventive services can achieve the dual goals of enhancing the health of all Americans and making prudent use of scarce resources (McMorrow, Kenney, & Goin, 2014). More excellent use of proven clinical preventive services in the United States could avert the loss of more than two million life-years annually. Increasing the utilization of those services to 90% would result in total savings of at least \$3.7 billion. The findings suggested that policymakers should pursue options that move the nation toward greater use of proven preventive services (McMorrow et al., 2014).

Accountable care organizations – \$372 million dollars. Accountable care organizations were included in the Affordable Care Act in part because simulations suggested that CMS could achieve savings from these models, and an earlier program, the physician group practice demonstration (PGPD), appeared to be effective (Frech III et al., 2015). Transitioning patients from hospitals to low-cost sites, like specialized nursing facilities, have also proven to reduce costs (Koury et al., 2014). Eliminating duplicate lab tests and increasing generic drug use are additional ways to cut costs and manage spending (Nyweide et al., 2015). Testing will be beneficial if they are medically necessary to prevent overuse of fee for service (Frech III et al., 2015). The use of generic medications in place of more expensive and costly brand-name drugs can significantly reduce spending while improving quality measurements (Nyweide et al., 2015).

Advocate Physician Partners, an ACO representing multiple hospitals and thousands of doctors, partnered with pharmacists to fill prescriptions with only available generics (Howard et al., 2015). The prescription contributed to reducing costs and increase the use of generics by 19 percentage points, all while improving quality of care in patients with chronic diseases (Hassali et al., 2014; Koury et al., 2014). All of the organizations involved in the program met the quality benchmarks required to be eligible for savings, and some achieved sufficient savings to receive bonuses (Nyweide et al., 2015). Overall, CMS estimated that PGPD participants reduced spending by \$137 million over the program's five years (Frech III et al., 2015).

Outpatient services. Concern over rapidly growing health care costs has led to the development of various cost-control mechanisms, such as utilization review, case

management, exclusive contracting arrangements with selected providers, and risk sharing (Leslie & Rosenheck, 2014). Little research exists, however, on (a) the scale of the inpatient and outpatient cost savings over time, (b) the extent to which, outpatient services substitute inpatient services, (c) what components of cost are most responsible for the savings, and (d) whether cost savings differ by diagnostic group.

According to the Healthcare Cost Institute (HCCI), outpatient visits (ER, outpatient surgery, and observation visits) constituted the fastest growing category of medical spending in recent years and totaled 17.5% of the employer-sponsored insurance (ESI) per capita healthcare spending in 2013 (HCCI, 2014). At 6.4% growth in 2013, prices for the above services rose faster than in 2011 or 2012. In 2013, per capita spending for outpatient-other services (ancillary, lab/path, radiology services, and miscellaneous outpatient services) accounted for 10.9% of total per capita ESI spending (HCCI, 2014). Between 2012 and 2013, per capita spending on outpatient-other services rose by \$24 to \$528. Spending for the above service category grew 4.7% (\$24), accounting for 13.1% of total per capita ESI spending growth (HCCI, 2014). The average price for an outpatient visit rose 6.4% between 2012 and 2013 from \$2,450 to \$2,607. The average price (unadjusted for intensity of care) for ER visits grew by 7.6% to \$1,595 for outpatient surgery visits by 5.7% to \$4,107; and for observation visits by 4.5% to \$1,945 (HCCI, 2014).

Leslie and Rosenheck (2014) found that substantial cost reductions for mental health services are primarily a result of cutbacks in inpatient treatment days. Managed care has not caused a shift in the pattern of care but an overall reduction of care. Swanson

et al. (2014) assessed the New York state's net costs for assisted outpatient treatment and concluded that assisted outpatient treatment requires a significant investment of state resources but can reduce overall service costs for patients with the serious mental illness. For those who do not qualify for assisted outpatient treatment, voluntary participation in intensive community-based services may also reduce overall service costs over time, depending on characteristics of the target population and local service system (Swanson et al., 2014).

Miscellaneous. Besides the categories mentioned above, many other factors could be directly related or inversely related to healthcare costs such as the fee for service payment system, physician-centric business model, and value-based purchasing model. Bundled episode payments and disaster readiness are also factors that are inversely related to healthcare costs. The factors have an influence not negligible on the overall U.S. healthcare spending.

Transforming small independent practices to patient-centered medical homes is widely believed to be a critical step in reforming the U.S. healthcare system (Karagiannis et al., 2014). Four characteristics of small primary care practices were found by the researchers to inhibit their ability to transform this new care model seriously. Small practices were extremely physician-centric, they lacked meaningful communication between physicians, and they were dominated by authoritarian leadership behavior (Karagiannis et al., 2014). In addition to payment reform, a shift in the mindset of primary care physicians would also be necessary to achieve the goal of healthcare savings to their patients.

A clinically integrated network (CIN) offers an increasingly attractive alternative to physician employment for accelerating the shift from volume- to value-based care delivery and payment models. Physicians often are more productive when operating in an independent practice than when employed by a health system (Guest, Campbell, Larch, & Williams, 2015). In addition, a health system's operating expenses per physician have been shown to be significantly lower when managing a CIN compared with managing employed physicians: The 2014 Medical Group Management Association Cost Survey reports that median operating expenses for a health system in the employed physician model range from \$30,00 to \$450,000 per physician, depending on specialty, whereas recent Deloitte Consulting experiences indicate operating expenses for a CIN can range from \$30,000 to \$50,000 per physician, depending on the scope of services offered to participants (Guest et al., 2015). Health systems with successful CINs reflect better clinical cost performance in shared-savings arrangements when compared with organizations in which employment is the primary physician engagement strategy (Guest et al., 2015).

The National Quality Strategy of the U.S. Department of Health and Human Services broadly defines the outcomes that the Centers for Medicare and Medicaid Services (CMS) wants to achieve through the care it purchases for its beneficiaries. The strategy's three aims of better health, better care, and lower costs capture CMS's concept of value - improved outcomes for individuals and populations at lower costs (Tanenbaum, 2016). The value-based purchasing (VBP) is one of the most potentially transformational tools that the CMS has to support the three aims. The VBP rewards

providers who deliver better outcomes in health and healthcare for the beneficiaries and communities they serve at lower cost (Tanenbaum, 2016). As a result, there is an emergent trend of slowing growth in healthcare costs along with hospital performance improvement (Tanenbaum, 2016).

The PPACA contains some provision for improving the delivery of healthcare in the United States, among the most impactful of which may be the call for modifications in the packaging of and payment for care bundled into episodes. The move away from fee for service payment models to payment for coordinated care delivered as comprehensive episodes is heralded as having great potential to enhance quality and reduce cost, thereby increasing the value of the care provided (Greenwald, Bassano, Wiggins, & Froimson, 2016). The fee-for-service mechanism of paying physicians is the major driver of higher health care costs in the United States. The fee-for-service contains incentives for increasing the volume and cost of services (whether appropriate or not), encourages duplication, discourages care coordination and promotes inefficiency in the delivery of medical services (Medford-Davis, Marcozzi, Agrawal, Carr, & Carrier, 2017).

The Episode of Care Payment Demonstration project, which is authorized by the ACA, requires the Centers for Medicare and Medicaid Services to experiment with bundling Medicare Part A and Part B payments for inpatient care (Erickson et al., 2017; Siddiqi et al., 2017). The central issue in any proposal for aggregating payments is determining at what level services should be bundled together. Episode-based bundled payments are easier for individual physicians or small physician groups to manage since a given physician is often involved in the full course of a care episode (Bozic, Ward,

Vail, & Maze, 2014). Although bundled payments can reduce waste primarily in the post-acute care setting, concerns arise that, to maintain income levels that are necessary to cover fixed costs, providers may change their behaviors to increase the volume of episodes. Such actions would mitigate the savings that Medicare might have accrued and may perpetuate the fee-for-service payment mechanism, with episodes of care becoming the new service (Weeks et al., 2017).

Bozic et al. (2014) maintain that a possibility exists to achieve very substantial health care savings by moving from a fee-for-service model to bundled payments for episodes of care, whether in a stand-alone program or as a component of an overall global-payment model. Although bundled payments have some advantages over the current reimbursement system, true cost-savings to Medicare will only take place when managers and the federal government address the issue that underlies much of the waste inherent in the system and provides ample incentives to eliminate capacity and move toward capitation (Weeks et al., 2017).

Recent public health emergencies including Hurricane Katrina (2005), the influenza H1N1 pandemic (2009), and the Ebola virus disease outbreak in West Africa (2014–2015) have demonstrated the importance of multiple-level emergency planning and response. An effective response requires integrating coordinated contributions from community-based health care providers, regional healthcare coalitions, state and local health departments, and federal agency initiatives (Hinton et al., 2015). The emergency care system is an essential part of the U.S. health care system. In addition to providing acute resuscitation and life- and limb-saving care, the emergency care system offers

considerable support to physicians outside the emergency department and serves as a critical safety-net provider (Arendts, Jan, Beck, & Howard, 2017).

However, excessive and inappropriate utilization is wasteful and can diminish surge capacity when it is most needed. Specific features of the U.S. healthcare system have imposed strains on the emergency care system. In times of disaster, the emergency care system must be able to surge rapidly to accommodate a massive influx of patients, sometimes with little or no notice (Lurie et al., 2013). As is the case with other aspects of the health care system, emergency care must be transformed in conjunction with the development of meaningful, actionable, and transparent measures of quality and spending that enable the individual and the community to understand how the system is performing day to day, and how it is likely to serve them in a disaster (Hinton et al., 2015).

Summary of categories inversely related to healthcare costs. Table 2 depicts the categories, estimated potential savings, and percentages. The total potential savings exceed \$391 billion and represent 12.6% of the \$3.1 Trillion spent on yearly healthcare expenditure.

Remarks:

Let us consider that healthcare stakeholders achieve the goal of reducing cost, improving the system overall, and reach the targeted goal of saving \$1.06 trillion a year. The annual healthcare spending could then decrease to \$2.04 trillion.

1. This level of overall healthcare spending, even though significantly reduced, represents a spending per capita of \$6,800 for the United States.

2. In 2012, the average healthcare spending per capita in the OECD countries was \$3,484.
3. Even if the U. S. achieves the extraordinary challenge of reducing the healthcare cost to a level of \$6,800 per citizen, we will still be spending twice as much as we need to.
4. The road ahead is long; healthcare managers need to start taking the right steps towards the ultimate goal.

Table 2

Summary of Potential Healthcare Savings and Percentages

Categories	Healthcare savings (Billions dollars)	Percentage (%)
Health information technology	256.00	65.43
Healthcare literacy	73.00	18.66
Medical tourism	40.00	10.22
Safety and efficiency improvements	12.16	3.11
Use of telemedicine	6.00	1.53
Preventative care	3.70	0.95
Accountable care organizations	0.37	0.09
Outpatient services	-	0.00
Miscellaneous	-	0.00
Total	\$ 391.23	100.00%

Note. The savings derived from the U.S. healthcare system exceed \$391 billion. When adding the avoidable spending of \$ 666 billion, the amount of healthcare savings could exceed \$1.06 trillion and represents 34.1% of the \$3.1 trillion yearly healthcare expenditures.

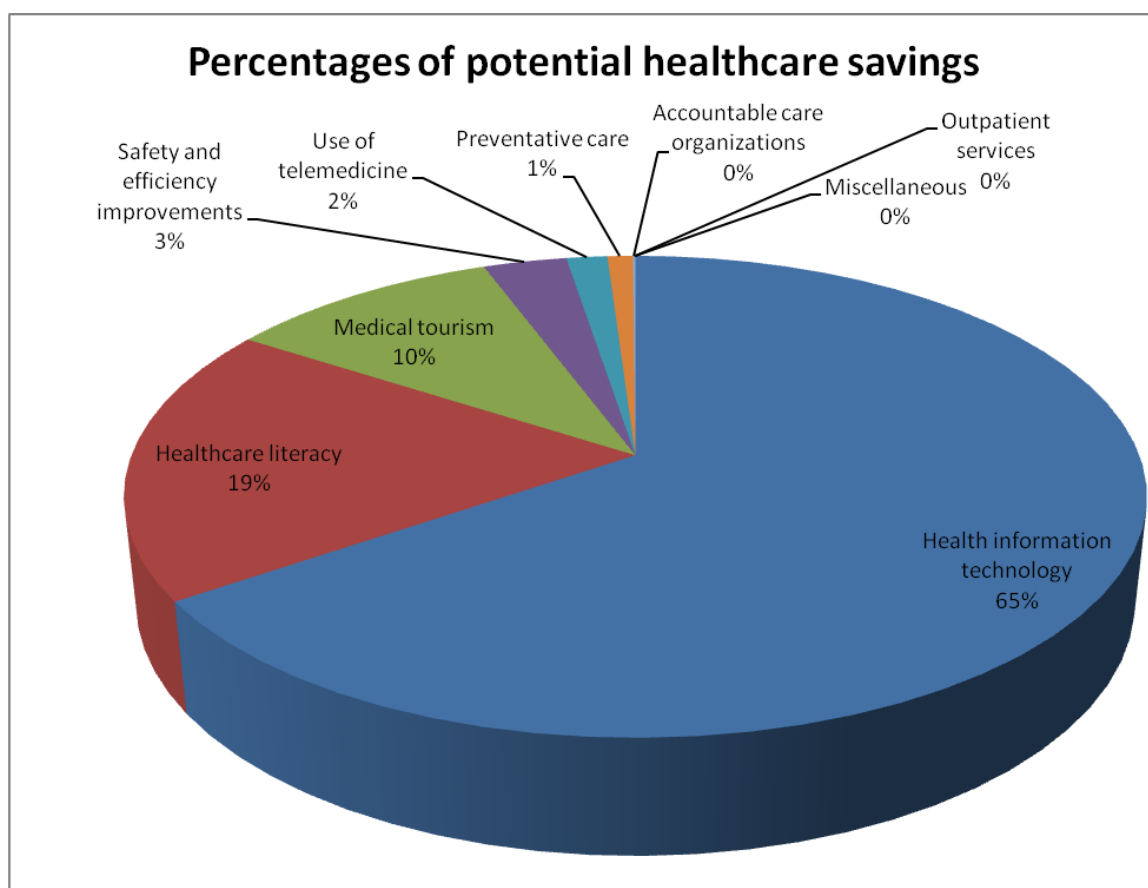


Figure 2. Percentages of potential healthcare savings.

Transition

Section 1 included information on the need to identify and explore how healthcare either directly (+) or inversely (-) related to healthcare costs. The qualitative, single site study design is appropriate for the study that may aid healthcare managers to navigate various challenges that healthcare practitioners and stakeholders need to overcome in the reduction of costs. The information in the literature review includes the rationale for transforming healthcare organizations in an era of health reform and adopting evidenced-based practices also to increase quality while they are focused on reducing costs. Section

2 includes a detailed explanation of the chosen study configuration and data collection strategy.

Section 2: The Project

My review of the professional literature substantiated the general business problem of how the high cost of limited and modest healthcare services jeopardizes the standard of living and the economic security of citizens. The literature review also supported my believe that some healthcare managers have limited strategies to improve efficiency while reducing healthcare costs.

In the following subsections, I offer the purpose statement, discuss my role as a researcher, identify the study participant selection process, and outline my rationale for choosing the selected research design and methods. I also discuss the techniques used for population and sampling, along with data collection instruments, techniques, and analysis. The section ends with a discussion of reliability, validity, and data saturation.

Purpose Statement

The purpose of this qualitative, exploratory single case study was to identify the strategies that some healthcare managers use to improve efficiency while decreasing healthcare costs. The specific population for the study consisted of six healthcare managers (one medical doctor, one care manager, one nurse manager, one safety and risk manager, one finance manager, and one healthcare administrator) with at least 3 years of experience in successfully improving efficiency and reducing costs. Documentation, archival records, and interviews with managers in a non-profit hospital in the state of Illinois provided sufficient data. Improving efficiency while reducing healthcare costs is a dilemma faced by some healthcare managers. Healthcare managers may use the findings

of this study to develop new ways of managing the U.S. healthcare system for improved efficiency while reducing healthcare costs.

Role of the Researcher

The role of the researcher in a qualitative research is to systematically collect, order, describe, and interpret data generated by interviews, observations, and documentation (Marshall & Rossman, 2016; Sandelowski, 2015). The goal of qualitative research is to explore the behavior, processes of interaction, and the meanings, values, and experiences of purposefully sampled individuals and groups (Boddy, 2016). The desired outcome for qualitative researchers is to make conceptual generalizations from a local and particular context to other settings (Mohammed, Moles, & Chen, 2016).

In my role as the researcher, I worked to identify strategies that can lower healthcare costs without negatively influencing either access to services or quality of services. I had no working relationship with the participants I interviewed in this study. I also do not have any connection with the Illinois hospital where I did my research.

In this study, I interacted with participants and adhered to the Belmont Report guidelines (HHS.gov, 2014) of fairness, beneficence, and justice. The Belmont Report is a statement of basic ethical principles and guidelines to address the potential ethical problems involved with researching human subjects (HHS.gov, 2014). I assured participants that I would maintain their confidentiality before they signed the release form.

Researchers are responsible for mitigating and eliminating as much bias as possible, which begins with strong interview questions (Bryman & Bell, 2015). To avoid

viewing data through a personal lens or perspective, the researcher needs to be an objective observer. As the investigator, my goal was to maintain objectivity in the data collection process because the ideas and beliefs in this study are shared by other professionals in the healthcare field. In contrast to quantitative researchers who use survey instruments and other tools for their data collection, qualitative researchers serve as active inquirers and engage directly with study participants to collect data (Merriam, 2015).

The qualitative researcher can develop a case management protocol as a set of guidelines for them to follow while conducting the interviews in the form of (Brinkmann, 2014). A case management protocol details each of the researcher's steps in the research process. Other researchers will be able to use this protocol to do similar research (Houghton, Murphy, Brooker, Casey, 2016; McCrae & Purssell, 2016). Achieving the goal of credibility requires that all case study interviews be structured and handled professionally in an equitable fashion (Bryman & Bell, 2015). I asked the participants in this study clear and open-ended interview questions. As an outsider, I had developed the interview questions based on the information collected from the literature review and discussions with the chair of my doctoral committee. Theoretical ideas are essential in case study design and are usually developed before data collection since they guide the data collection process.

Participants

To be eligible for this study, participants must have had a minimum of 3 years of experience in successfully improving efficiency and reducing costs. The six participants held managerial positions at a hospital in Illinois. A purposeful sampling procedure guided my selection of participants for the study. Researchers engage in purposeful sampling with the goal of gathering data from specific and targeted individuals or groups of individuals with knowledge and experience relevant to the topic of study (Bernard, 2017). Sekaran and Bougie (2011) emphasized that purposeful sampling is a best practices in qualitative case study research. I employed purposeful sampling to collect information and insights from individuals with specific knowledge and expertise relevant to the management of healthcare costs and improvement in healthcare services in Illinois.

The participants worked and were involved in various facets of healthcare management including program administration, technological delivery, healthcare delivery, and quality improvement. The collected dataset represented the perspectives and experiences of the above individuals. I recruited participants by writing a letter to targeted individuals in healthcare leadership positions. The targeted individuals received letters via e-mail or regular mail. The letters included a description of the study objectives and intent and provided prospective participants with information sufficient to determine if they wished to participate in the study.

The participants in the research study received an informed consent form to review and sign. The consent form ensured that each potential study participant could decide whether or not to participate based on the content of the letter and information

provided in the consent form. During the interviews, I developed productive working relationships with participants by encouraging them to share information from their perspectives, flexibly framing initial and follow-up questions, and listening attentively (see Constantinou, Georgiou, & Perdikogianni, 2017; Holloway et al., 2016).

To ensure the confidentiality of study participants and their organization, I used a coding system to identify each participant. Participants were free to withhold information they felt would put their professional status at risk, and participants who felt uncomfortable responding to specific questions were not required to do so. Participants had the option to end their participation in this study at any time without facing any consequences. Finally, I stored electronic copies of collected data and analysis files on a personal computer protected by a password and also secured all hard copies of data and analytical materials in a locker.

Accurate sampling is crucial in qualitative research. Therefore, the population characteristics deserve more consideration than the population size (Onwuegbuzie & Hitchcock, 2017). The goal of qualitative research is to achieve the understanding of a precisely observable fact from some interviewed participants. The insertion of those facts will be sufficient to reflect the diversity of perspectives and insights across the sample population (Wilson et al., 2017; Marshall & Rossman, 2016). The optimum number of participants should be between 8 and 10 (Boddy, 2016). I planned to undertake a minimum of 5 interviews for my study using member checking to ensure the reach of data saturation.

Research Method and Design

Qualitative, quantitative, and mixed methods are the three potential research methods available to researchers. Yin (2014) indicated that a person's worldview assumptions, nature of their study, and the objectives of their research can be used as a guide for the selection of the design for the proposed study. A researcher looking to test an empirical truth of a hypothesis might have a preference for quantitative research (Kisely, 2015), whereas a researcher seeking to genuinely understand a phenomenon or an individual's behavior might have a preference for qualitative research (Yin, 2014). A mixed methods study may provide a broad view of the topic for research while emphasizing both quantitative and qualitative methods (Onwuegbuzie & Corrigan, 2014). A mixed method approach would provide a comprehensive and time-consuming study of the subject matter but it was not needed for me to address my research question (Olasina, 2016; Serban & Roberts, 2016).

I choose a qualitative case study to help me address the central research question to identify strategies available to healthcare managers to improve healthcare efficiency while reducing costs. The leading foundation for exploration of the above research question is descriptive and interpretative, which are distinctiveness related to qualitative research methodology (Olasina, 2016; Serban & Roberts, 2016). Qualitative researchers emphasize individual's life experiences, knowledge base, and perspectives. The above factors affect outcomes, rather than standardized quantitative instruments (Mohammed et al., 2016; Yin, 2014). Participants' responses in qualitative research studies allow the researcher to identify themes to address the research question. The nature of my research

and the time allotted for completion of the study had a significant influence on my selection of the qualitative approach.

Research Method

Qualitative research is distinguished by its emphasis on description and interpretation (Olasina, 2016). In this study, I explored the strategies that healthcare managers implement to improve efficiencies and cut costs. Instead of focusing on the identification and quantification of factors and numbers, I used a qualitative approach to explore how some healthcare managers find ways and means to improve healthcare efficiency while reducing healthcare costs.

The researcher's capacity to define variables in qualitative research widens the scope of the study beyond individual perception of the phenomena (Yin, 2014).

Qualitative research is a means of exploring contemporary phenomenon through rich description and interpretation of participant experiences and perceptions (Olasina, 2016; Serban & Roberts, 2016). I considered alternative quantitative and mixed research methods before determining the appropriateness of a qualitative research method for my study. My objective of understanding and describing strategies implemented by healthcare managers to improve healthcare systems while reducing costs in Illinois did not require the quantification and analysis of factors or numbers. Accordingly, quantitative or mixed methods research approaches for the study were disqualified.

Research Design

Qualitative models include (a) ethnography, (b) phenomenology, (c) grounded theory, and (d) case studies (Kisely, 2015). I evaluated the above qualitative research

designs for the study suitability. A phenomenological model is limited in research applicability because of exclusive dependence upon interview data based on lived experiences (Olasina, 2016; Serban & Roberts, 2016). A phenomenological model was, therefore, not adequate for the research study. Ethnography concerns the examination of the behavior and belief systems of cultural groups (Olasina, 2016; Serban & Roberts, 2016). Ethnography was also inadequate because healthcare cost, quality of service, and access may be related to cultural issues but are not applicable in helping me to address my research question. Grounded theory involves the discovery or generation of a theory. The application of grounded theory was not appropriate for the study engaging exploration of a particular situation. Based on reviewed qualitative research design options, an exploratory case study design was the most suitable for my research study.

According to Saunders et al. (2017), qualitative studies should include a sample size supporting data saturation. Saturation involves the concept that further collection of data is repetitive and does not enhance research findings on the investigated study topic (Saunders et al., 2017). Data saturation may depend on the size of the population sampled (Hagaman & Wutich, 2017). Rubin and Rubin (2012) asserted that the inclusion of a vast number of participants is not necessary to achieve balance and thoroughness during the conduct of a qualitative study. In my study, I used member checking to ensure the achievement of data saturation with my participants.

The case study approach employs techniques that support an in-depth exploration of a social phenomenon or behavior. Multiple sources of data collections and flexibility in the sources are factors that support the case study design (Kisely, 2015; Yin, 2014).

Case study design encourages the exploration of an explicit phenomenon and enables the investigation and description of the phenomenon within a particular, contemporary context (Yin, 2014). Researchers conducting case studies strive to represent the multiple realities described by study participants and interpret data collected from document reviews, observations, and interviews to build descriptions of phenomena (Ary et al., 2018).

The interview questions were semistructured and open-ended, which allowed the participants to articulate their personal views in reaction to the initial and follow-up questions (Yin, 2014). Similarly, the approach enabled the acquisition of in-depth knowledge of the subject matter. The suppleness of semi-structured interviews is not available in quantitative methods, which restricts the participants' responses to questions. Cohen and Fjeld (2016) believe that the value of qualitative case studies relies on exploring and understanding modern phenomena within the field of operations management. Similarly, Sekaran and Bougie (2017) stressed the importance of case study research to the development of theory within the business marketing research arena and emphasized the suitability of the case study design for the examination and description of complex and evolving events. Accordingly, I used a case study design to explore the strategies that are available to healthcare managers to reduce healthcare costs while improving the efficiency and quality of services.

Population and Sampling

Healthcare managers, who have considerable experience in managing healthcare organizations or implementing healthcare programs in the State of Illinois, constitute the

target population of the research study. Bernard (2017) discussed the suitability of purposeful sampling in collecting data from individuals who have knowledge and experiences explicitly related to the study topic. Ladhari and Tchegnna (2015) suggested that the techniques associated with purposive sampling influence the selection of participants with the broader knowledge base and more experience on the subject matter. Accordingly, I employed purposeful sampling to select study participants with relevant knowledge and experience sets.

Maximum variation sampling relies on the purposeful selection of participants from a range of groups to guarantee the exploration of the diversity of perspectives regarding the phenomenon of interest (Onwuegbuzie et al., 2017). The use of maximum variation sampling also facilitated the identification of common patterns in collected data (Merriam, 2015). As argued by Rubin and Rubin (2012), the number of sites selected for a qualitative study depends on the nature of the study research questions and the number of factors that might influence the studied phenomenon. I employed maximum variation sampling to identify and recruit study participants.

Snowball sampling is a form of network sampling that facilitates the identification of respondents within challenging to recruit or elite populations (Bernard, 2017). Application of the snowball sampling method involves asking current study participants to identify and recommend additional participants (Onwuegbuzie et al., 2017). There were no other study participants recommended by the sample participants as they would have been approached for possible inclusion in this study.

According to Palinkas et al. (2015), qualitative studies should include a sample size supporting data saturation. Saturation involves the concept that further collection of data is repetitive and does not enhance research findings on the investigated study topic (Palinkas et al., 2015). Data saturation may depend on the size of the population sampled (Boddy, 2016). Rubin and Rubin (2012) asserted that the inclusion of a vast number of participants is not necessary to achieve balance and thoroughness during the conduct of a qualitative study. According to O'Reilly and Parker (2012), the conduct of 6 interviews provides sufficient data for saturation. The addition of three additional interviews may not offer the discovery of new themes (O'Reilly & Parker, 2012; Rowlands, Waddell, & McKenna, 2016). The consistency of topics and ideas based on the participants' responses provided saturation and sufficiency to the data collected and also justified the sample size. Participants had the option to withdraw from the study at any time without penalty.

Ethical Research

Qualitative researchers are required to conduct their research ethically. The ethicality of qualitative research calls for an appropriate study design. The investigator should treat the human subjects who are participating in the study with respect, beneficence, and fairness. Social researchers are required to ensure that they are not putting participants at risk (Bernard, 2017). The Walden University Institutional Review Board (IRB) requires that before any data collection, researcher submits a research plan and obtains written approval from the IRB. The Walden IRB approval number for my study is 11-14-16-0372355. I did not put participants at risk or expose them to any harm

during the study as the IRB requirements were in full compliance. Therefore, ethics was at the center of the research process.

I also provided participants with information about the study objectives and intent as well as the informed consent form to review and sign, also with an opportunity to decide if they wished to participate in the study based on information provided in the consent form. The involvement in the study was voluntary without any incentives for participants. A coding system ensured the confidentiality of the study participants and their organizations of affiliation. The participants in the study felt free and comfortable to respond to interview questions without any constraints. I will save all data collected during the data gathering and data analysis process in a safe, secure location for 5 years to protect the rights of participants. Participants had the option to pull out of the study process at any time without consequences, identification, or utilization of their inputs or data.

Data Collection Instruments

Qualitative research offers insight into emotional and experiential phenomena in healthcare to determine “how” and “why” questions (Gibson, 2016; Rosenthal, 2016). The qualitative analysis encompasses four crucial elements. First, the participant selection must meet the eligibility criteria for this study, and the participants must be knowledgeable about the research question. Second, the data collection methods must be suitable for the research objectives and setting. Third, the data collection procedures, which included field observations, interviews, and document analysis, must be inclusive enough to support the collection of precious data and robust or thick descriptions of the

observed events (Giacomini, Cook, & Evidence-Based Medicine Working Group, 2000). Fourth, the data must be suitably analyzed and the findings sufficiently corroborated by using multiple sources of information. More than one investigator to collect and analyze the raw data was not needed for this study. Member checking was used to establish whether the participants' viewpoints were adequately interpreted by myself as the researcher with existing social science theories (Giacomini et al., 2000).

Qualitative researchers serve as their instruments, using document reviews, observations, and participant interviews to collect data (Merriam, 2015). Accordingly, I was an essential tool for the conduct of the case study of how to reduce healthcare costs while improving healthcare efficiency. Research data came from the review of documents and conduct of interviews with healthcare managers. The managers all had experience in implementing strategies that aimed to achieve the goals of improving healthcare efficiency while reducing healthcare expenses in their facilities. According to Stake (2005), the use of multiple sources of data, rich in real-life situations, has been described as a distinctive characteristic of case study methodology. Diverse sources of data allowed for collection and analysis to obtain multiple perspectives and points of view to get a holistic understanding of the phenomenon being researched (Ary et al., 2018). Triangulation is a term that has frequently been used to describe the use of multiple data sources and was also used in this study (Hussein, 2015).

I used multiple sources of data to guarantee study construct validity through data triangulation. According to Yin (2009), case study researchers use data triangulation via the gathering of information from multiple sources to substantiate the same phenomenon

and to ensure overall research quality. Fusch and Ness (2015) defined data triangulation as the use of several different lines of evidence to support the complete assessment of identified phenomena. As described by Fusch and Ness (2015), data sources are not the methods used to gather evidence but are instead the observational units (time, space, or people) that form the foundation for the collection of information.

Unlike Yin, who has suggested that the purpose of using multiple sources is to assist the researcher in identifying the convergence of findings (2003), Stake (2005) has indicated that triangulation can also be used by researchers to determine divergence. In the study, I used triangulation for both purposes and to collect data from multiple sources to ensure that data were as productive as possible to confirm the findings (Gibson, 2016; Rosenthal, 2016).

I designed and adhered to a particular case management protocol for the conduct of the qualitative case study. A case study protocol served to ensure the reliability of the study by outlining the procedures and rules applied during the conduct of research and by ensuring that study data collection, analysis, and reporting efforts remain focused on the study line of inquiry (Yin, 2014). Based on case study protocol guidance outlined by Yin (2014), I prepared and followed a case study protocol that contains (a) an overview of the planned project, (b) a description of the protocol purpose and intended use, (c) a description of study data collection procedures, (d) an outline of the case study report content, (e) a list of the case study interview questions, (f) a summary of the data analysis techniques and tools to be used, and (g) a description of the study reliability and validity methods to be used. Appendix A presents the proposed case study protocol.

Addressing research quality is essential for qualitative case researchers for at least six reasons. First, attention to quality is likely to lead to better practices in the field (Welch & Piekkari, 2017). Second, being sensitive to how quality may result in richer insights and, therefore, better theory may lead to more useful results. Third, active debate over research quality is a sign of a healthy research community and thus, will improve the status of the methods used in a research study (Marshall & Rossman, 2016; Welch, 2018). Fourth, having clear standards of quality will improve the legitimacy of case research and potentially increase the influence of case research. Fifth, such debates can lighten concerns raised by other researchers over the value of qualitative research (Bradshaw, Atkinson, & Doody, 2017). Finally, having clear guidelines on how to address case quality is essential for novice researchers (Hancock & Algozzine, 2016; Sekaran & Bougie, 2017).

The creation and use of a case study database will further enhance the reliability of case studies. Case study databases consist of the notes, documents, tabular data, and narratives collected by researchers during the conduct of case study research and provide a mechanism for other investigators to review case study evidence directly rather than having to rely solely on a review of final case study reports (Yin, 2014). I organized and maintained a case study database for the study of healthcare cost, health service efficiency in the State of Illinois. I created a database that included (a) notes taken during the review of documents and the conduct of interviews, (b) copies of documents and interview audio files and transcripts, (c) tables of codes and thematic elements resulting

from the analysis of collected data, and (d) initial (draft) narratives written during the analysis of collected data and summarization of study findings.

I established the internal validity (credibility) of the study using (a) the assessment of rival explanations, (b) researcher bias identification, and (c) member checking. As described by Yin (2012), researchers can ensure the credibility of their qualitative case studies by identifying, assessing, and refuting alternative explanations for studied phenomena. Researchers' theories, values, or preconceptions might influence how they structure and conduct their studies (Yin, 2014). Accordingly, qualitative researchers must identify and manage their biases before and during the collection and analysis of data to ensure the integrity and credibility of study findings (Boddy, 2016).

During the process of member checking, researchers provide study participants with selected data products, preliminary findings, and conclusions and asked participants to comment on the accuracy and credibility of the information provided by them during the interviews (Ary et al., 2018). I ensured that a comprehensive and integrative approach to the establishment of internal validity prevailed for the study by combining the evaluation of rival explanations, research bias identification, and member checking.

I demonstrated the external validity of the study by providing rich descriptions of the study population and study context. Qualitative researchers augment the external validity of their social science research by selecting representative study samples and by providing rich descriptions of the contexts within which they conduct their studies. (Bernard, 2017).

The collection of data for the case study led to an amount of data (e.g., documents, interview transcripts) too voluminous for inclusion as appendices to the study. Therefore, I made all raw data collected during the study available to other investigators upon request including all analytical products—specifically, codes and themes deduced from the review of documents and interview transcripts—in appendices to the study.

Data Collection Technique

In case study research, researchers use documents as a source of contextual information about events that they cannot directly observe; documents also are used by researchers to confirm or question information from other sources (Ary et al., 2018). I collected data from interviews and a variety of documents, including project proposals, reports, presentations, email communication, minutes of meetings, abstracts, policies, Web site data, audit data, written reports, memoranda, newspaper articles, and executive letters (Rosenthal, 2016; Yin, 2014). I also gathered information from the review of publicly available documents and materials provided by study participants to explore and describe how healthcare managers deal with improving healthcare while reducing costs in Illinois.

Document analysis involves the review and evaluation of both printed and electronic materials to derive meaning, gain understanding, and develop empirical knowledge of a particular phenomenon (Ary et al., 2018; Haslam et al., 2017).

Documents are a relevant source of information for all varieties of case studies and are characterized as data sources that are (a) efficient, (b) stable, (c) unobtrusive, (d) exact in

content, (e) cost-effective, and (f) providing broad coverage across time, events, and settings (Yin, 2014).

I used a purposeful, criterion-based convenience sampling method (Boddy, 2016) to identify and involve individuals thought to possess the knowledge about the implementation of programs designed to improve healthcare services while reducing costs (Rosenthal, 2016). As described by Rubin and Rubin (2012), semistructured interviews involve the use of both prepared and follow-up questions to learn more about a particular topic. Semi-structured interviews allow investigators to focus the discussion on issues specifically related to study research questions (Brinkmann, 2014). However, respondents are still provided with the opportunity to answer at length and to provide rich and detailed responses (Rubin & Rubin, 2012). Therefore, I used semistructured interviews to gather data during the conduct of the case study that aims to explore and describe how healthcare managers deal with improving healthcare services while reducing costs in their organizations.

Face-to-face interviews are an efficient form of qualitative interviewing. Researchers conducting face-to-face interviews can establish rapport with participants and can readily assess visual and emotional cues indicating how participants are responding to particular lines of discussion (Brinkmann, 2014). To the highest degree possible, I conducted face-to-face interviews at a location of each participant's choosing to minimize inconvenience to participants and to ensure the conduct of effective interviews. Alternatively, internet or phone interviews replaced face to face interviews in the cases in which participant schedules rendered face-to-face interviews impractical.

Phone interviews could also be a supplement to face-to-face interviews to ask any follow-up or clarification questions and to solicit comments from participants following their review of draft interview transcripts that they received.

McNamara (2009) suggests the importance of the development stage to maintain an explicit focus as to how the interviews shall provide maximum benefit to the research study. Bradshaw, Atkinson, and Doody (2017) offered some pre-interview exercises researchers can use to improve their instrumentality and address potential biases. McNamara (2009) applies eight principles to the preparation stage of interviewing, including the following ingredients: (a) choose a setting with little distraction; (b) explain the purpose of the interview; (c) address terms of confidentiality; (d) define the format of the interview; (e) indicate how long the interview usually takes; (f) tell participants how to get in touch with the interviewer later if they want to; (g) ask participants if they have any questions before the interview gets started, and (h) the interviewer should not count on memory to recall answers. By ethical interviewing practices, I requested participant permission to record before the conduct of each face-to-face interview (Brinkmann, 2014) and also stored electronic copies of all interview audio files on a password-protected laptop for the subsequent creation of interview transcripts for analysis.

Data Organization Technique

The organization of collected data is essential during the data gathering process and before the start of the data analysis. Marshall and Rossman (2016) recommended that qualitative researchers create and maintain data logs for the purpose of recording information regarding the types, times, and locations of data gathered. Therefore, I

created and sustained a record of all data collected during the conduct of the study and generated a data record on a password-protected computer and included an entry for each article of data that contains information on (a) data type (document or interview); (b) data identification (document name or interviewee number); (c) document file name on the computer; (d) date of collection; (e) location of collection; and (f) corresponding research notes file name.

Yin (2014) described note taking during the conduct of case study research as an essential practice for ensuring that researchers capture the essence of reviewed documents and interviews during and immediately following the collection of data in the field. Researchers compile field notes and use the materials to support the analysis of case study data (Yin, 2014). I recorded notes during the review of collected documents and the conduct of interviews and included references to appropriate note entries in the electronic data record. Electronic media supported the storage of all the collected data in the study. A password-protected laptop computer stored all primary copies of all study materials (documents, interview recordings, interview transcripts, coded data files, and field notes). To ensure that critical research data are safe, a cloud backup data storage system supports secondary copies of all study materials. I maintained some hard copies of research data and interview transcripts, particularly useful during the coding and analysis process. Converted handwritten notes taken during the review of documents, during and following interviews, served as an electronic journal document.

Data Analysis

Stake has depicted the case study approach as possessing the ability to grasp the minutiae of a phenomenon (Gibson, 2016; Rosenthal, 2016). Case studies have been described as best suited to research that asks “how” and “why” questions (Ary et al., 2018; Yin, 2014). I developed interview questions that facilitated exploration of the primary research question guiding the conduct of the qualitative case study that is to identify the strategies that healthcare managers use to improve efficiency while decreasing costs. I structured interview questions in an open-ended fashion to encourage study participants to share insights, perspectives, and describe their views and experiences in implementing programs that were designed to improve healthcare services while reducing costs in their organizations. The interview questions were as follows:

1. What are the primary healthcare cost drivers in your facility?
2. How do you in your position attempt to improve efficiencies in a healthcare setting?
3. What are the best strategies you use to reduce healthcare costs?
4. What have you done specifically to improve efficiencies that resulted in cost saving in your organization?
5. How do you increase outpatients’ treatments or surgeries in an effort to reduce healthcare costs to your patients without hurting your inpatients revenues?
6. How do increase the use of Health Information Technology (HIT) in an effort to improve efficiency while reducing healthcare costs?

7. What have you done in your organization to reduce administrative and overhead costs?
8. Is there anything else that you think is important to tell me about achieving efficiency in healthcare and reducing costs?

I employed coding as the primary data analysis technique for the qualitative case study. Qualitative researchers use coding as a mechanism for categorizing and describing collected data. Coding methods include deductive coding and inductive (open) coding. As described by Bernard (2017), researchers employing deductive coding use the theoretical or conceptual framework for their studies as the basis for derivation of codes used during the data analysis process. During the application of open coding, researchers immerse themselves in the data during the review process and focus on capturing emerging (versus predetermined) themes (Bernard, 2017).

Both deductive and open coding were part of a thorough analysis of data collected for the proposed qualitative case study (Hancock & Algozzine, 2016; Sekaran & Bougie, 2017). Primarily, accurate coding allowed for the development of original codes used for analysis of collected document reviews and interview data. Codes were also derived from an analysis of the interview questions to identify and to isolate keywords and themes related to the conceptual framework selected for the study. The identification of concepts and ideas that emerged from the review of collected qualitative data is the foundation for open coding (Bernard, 2017; Rubin & Rubin, 2012). I also employed open coding during the review of documents and interview data collected during the conduct of the case study and examined concepts and themes that were supplemental to the deductive codes

used during the analysis process. The use of open coding supported the application of theory triangulation: the exploration of alternative explanations for the social phenomenon (Ary et al., 2018). By combining open coding with accurate coding during the conduct of the study of healthcare management, I was able to identify the themes and strategies that healthcare managers use to improve efficiency while decreasing costs in Illinois.

Computer-assisted qualitative data analysis software (CAQDAS) can be used by researchers to support the handling and analysis of collected qualitative data. As described by Rubin and Rubin (2012), CAQDAS can be used to ingest data (e.g., interview transcripts) and to code subsequently and organize data and search for concepts and relationships between concepts in the data (Brinkmann, 2014). While CAQDAS can simplify and support the process of handling and analyzing massive amounts of textual data, qualitative researchers still must structure and conduct the actual analysis. Researchers using CAQDAS must input the codes used during the text analysis process and bear responsibility for using the software to the group, sort, and analyze emergent themes and formulate conclusions based on the reviews (Bernard, 2017; Leech & Onwuegbuzie, 2014).

I used the software tool- Atlas.ti7 to support the handling, sorting, and analysis of document and interview data collected during the study. Specifically, this software is useful in performing (a) keywords-in-context (KWIC) analysis, (b) constant comparison analysis, and (c) classical content analysis. Application of Atlas.ti7 to perform KWIC, constant comparison, and academic content analysis enabled the assurance that

exploration and analysis of collected study data were suitably robust via data analysis triangulation (Onwuegbuzie et al., 2017).

As described by Onwuegbuzie, Frels, Collins, and Leech (2017), KWIC analyzes are used to explore the usage of keywords in the context and are helpful for identifying underlying connections implied by the wording used in documents or the language used by participants. I conducted KWIC analysis using Atlas.ti7 to facilitate the identification of appropriate codes within the collected data from the study. Constant comparison analysis involves the identification of underlying themes within collected data via the deductive and inductive coding of passages of text (Fisher, 2017).

Using Atlas.ti7 allowed performing constant comparison analysis of collected documents and interview transcripts using both deductive and original codes to identify and document emerging themes. The classical content analysis is conducted to determine the frequency with which codes appear in the text and are useful for determining, which concepts and issues are of the highest importance (Onwuegbuzie & Corrigan, 2014). The usage of Atlas.ti7 also allowed performing classical content analysis of study collected data to assess the frequency with which deductive and inductive codes appear in the data. Therefore, I used the information regarding code rate of occurrence to determine the relative importance of deductive and original codes and to identify major underlying themes and strategies within the data.

I used themes and strategies identified during the application of Atlas.ti7 as inputs to the final data analysis step: conduct of cluster analysis. Cluster analysis is a statistical method used to sort and to classify observations and to analyze how identified groups are

related (Bernard, 2017). Houghton et al. (2016) asserted the value of qualitative cluster analyzes for helping researchers to determine units of data, group the units of data into categories, and analyze how the groups relate to each other. Sekaran and Bougie (2017) described the use of cluster analysis to explore and describe business failure patterns among small enterprises. The software package SPSS facilitated a clustering analysis of the themes and strategies identified from the analysis of documents and interview transcripts.

I used a highly structured approach to reporting the case study to establish a clear chain of logic. A structured approach to writing helps to (1) ensure that nothing essential is left out, (2) strengthen the linkages between the various sections of the case report, and (3) enhance the efficiency of writing (Strauss & Corbin, 2015). Organizing tables and diagrams may be used in all the sections of the case research paper and can serve to depict scientific procedures, display a chain of evidence, illustrate complex analyzes, summarize findings, or explain the process of original derivation (Cronin, 2014). The use of tables and diagrams was not extreme. A balance between the presentation modes (i.e., text and summary devices) was needed. The above methods did not entirely replace, but summarized, complemented, and substantiated textual paragraphs (Arino, LeBaron, & Milliken, 2016).

Reliability and Validity

Reliability

Reliability is a crucial test that establishes the quality of social science research (Yin, 2014). Reliability occurs when another investigator can follow the decision track

used by the researcher. To achieve an appraisal trail, there should be: (a) a description of the particular purpose of the study; (b) a discussion on the criteria and motivation for the participants selection for the study; (c) a description of the data collection and how long the data collection lasted; (d) an explanation of how the data were reduced or transformed for analysis; (e) a discussing about the interpretation and presentation of the research findings; and (f) a communication about the specific techniques used to determine the credibility of the data (Houghton et al., 2016; McCrae & Pursell, 2016). Reliability is, therefore, a measure of study repeatability. If an investigator were to pursue the same procedures outlined by the previous researcher, the investigator should obtain the same results (Bernard, 2017).

The purpose of qualitative research is not to generalize to other subjects or settings, but to explore deeply a specific phenomenon or experience on which to construct further knowledge or to develop a more patient-focused practice that is sensitive to the research participants (Welch & Piekkari, 2017). Nevertheless, researchers can demonstrate case study reliability by using case study protocols and case study databases (Yin, 2014). Strategies used to establish reliability include having peers participate in the analysis process, providing a detailed description of the research methods, or conducting a step-by-step repeat of the study to see if results might be similar or to enhance the original findings (Houghton et al., 2016).

The issue of reliability in qualitative research is contentious; however, working iteratively with teams to develop coding schemes and elaborating the data into categories, subcategories, and conceptual frameworks add credibility to the notion that the results are

reliable (Hancock & Algozzine, 2016; Sekaran & Bougie, 2017). Therefore, if another group were to collect and analyze the data in an identical manner, the outcome would be very similar to that in the initial study (Hancock & Algozzine, 2016; Sekaran & Bougie, 2017). A case study protocol includes an outline of the research procedures and is used to ensure that case study data collection, analysis, and reporting activities remain focused on the study line of inquiry (Yin, 2014). Sekaran and Bougie (2017) asserted the importance of the use of case study protocols during the conduct of qualitative case studies in the business and management fields to ensure study reliability.

In order to ensure the reliability of findings from the case study on how to improve healthcare efficiency while reducing costs, in Illinois, I developed and adhered to a case study protocol that provided (a) an overview of the intended project; (b) a description of the protocol purpose and intended use; (c) a description of study data collection procedures; (d) an outline of the case study report content; (e) a list of the case study interview questions; (f) a summary of the data analysis techniques and tools to be used; and (g) a description of the study reliability and validity methods to be used. The study protocol can be found in an Appendix (see Appendix A). Case study databases are used by researchers to document all of the notes, materials, data, and narratives collected during the conduct of qualitative case studies (Yin, 2014). Case study databases serve as a tool that can be used by other investigators to review case study evidence directly rather than having to rely exclusively on the review of final case study reports prepared by the early case study researchers (Yin, 2014). I created and maintained a case study database for the study. The case study database contained (a) notes taken during the review of

documents and the conduct of interviews; (b) copies of documents and interview audio files and transcripts; (c) tables of codes and thematic elements resulting from the analysis of collected data; and (d) initial (draft) narratives written during the analysis of collected data and summarization of study findings. I used a case study database to show the reliability of the study by providing other investigators with insight into the data products and analytical methods used to originate research findings and conclusions.

Validity

Another crucial element measuring quality in social science research is validity. Validity is the accurateness and trustworthiness of research instruments, data, and findings (Bernard, 2017). High-quality qualitative research is discernible by (a) worthy topic, (b) rich rigor, (c) sincerity, (d) credibility, (e) resonance, (f) significant contribution, (g) ethics, and (h) meaningful coherence (Tracy, 2013). Good qualitative research is relevant, timely, meaningful, interesting, or evocative. Worthy topics often emerge from disciplinary priorities and, therefore, are theoretically or conceptually compelling (Tracy, 2013). A richly rigorous qualitative researcher is also better equipped to make smart choices about samples and contexts that are suitable or well poised to study specific issues.

Glaser and Strauss (1967) first introduced the notion of data saturation to the field of qualitative research. The concept of data saturation refers to the point in data collection when no new additional data are found that develop aspects of a conceptual grouping (Rowlands et al., 2016). The idea of data saturation is a very useful guide for such research, in which the appropriate sample size is a function of the purpose of the study

and the complexity, range, and distribution of experiences or views of interest, rather than of the statistical parameters used in quantitative research (Boddy, 2016). Satisfactoriness of sampling occurs at saturation, which means that the researcher reached the depth, as well as the breadth of information (Houghton et al., 2016; McCrae & Pursell, 2016). Sampling in qualitative research is concerned with the richness of information and the number of participants required; therefore, depends on the nature of the topic and the resources available (O'Reilly & Parker, 2012; Rowlands et al., 2016). Data saturation is an important concept as it addresses whether such a theory-based interview study is likely to have achieved an adequate sample for content validity (Boddy, 2016).

To specify data saturation, I followed the principles recommended by O'Reilly and Parker (2012) for analysis and reporting. First, the researcher should indicate a priori what the sample size of the first round analysis is. The first round constitutes the initial analysis sample. The initial sample size will depend on the complexity of the research questions, the interview topic guide, the diversity of the sample and the nature of the analysis. The second principle is about the researcher specifying the number of additional interviews without new common themes or ideas emerging to achieve data saturation. According to Fusch and Ness (2015), I used member checking rather than add participants to reach data saturation.

Researchers wanting to demonstrate the trustworthiness of their research are required to address (a) construct validity; (b) internal validity; and (c) external validity (Bernard, 2017; Strauss & Corbin, 2015). The primary concerns of qualitative researchers dealing with the validity are credibility, transferability, and trustworthiness (Birt, Scott,

Cavers, Campbell, & Walter, 2016). Sandelowski referred to validity as analytical validity, where data confirms a particular category (Sandelowski, 2015). Meticulous use of the procedures and techniques described in the case study, in combination with documentation supports the validity of the conceptual framework developed in a qualitative study (Sekaran & Bougie, 20117).

The demonstration of construct validity requires the identification and use of measures suitable for the studied phenomenon (Bernard, 2017). Yin (2009) asserted that researchers could use multiple sources of evidence to guarantee to construct validity. Use of multiple data sources allows for corroboration of findings of the same phenomenon and supports overall study quality via the gathering of proof from appropriately selected and various observational units (Hussein, 2015; Yin, 2014). Triangulation refers to the combination of data sources, different researchers, multiple perspectives on the phenomenon of interest, or the use of various methods to arrive at conclusions on the research question (Fusch & Ness, 2015). In qualitative research, triangulation gives a higher perspective and allows for more credibility in one's findings. When the findings from methods and data sources converge; one has more confidence in them, when they diverge. As a result, there is an opportunity to take a closer look at all data to gain a better understanding of the studied phenomenon (Hancock & Algozzine, 2016; Sekaran & Bougie, 20117). I collected study data from the review of documents and information from semistructured interviews and used the data gathered from both sources to triangulate findings and to enhance overall research quality. One strategy, to establish the transferability, was to provide a full description of the population studied by providing

descriptions of demographics and geographic boundaries of the study and to provide a interview protocol so other researchers would be clear on the methods used in this study (Welch & Piekkari, 2017).

Internal validity refers to the credibility of research findings (Merriam, 2015). Research credibility results from the use of active measurements to investigate social phenomena (Bernard, 2017). Yin (2014) argued that internal validity is primarily a concern for explanatory case studies only. I conducted an exploratory case study on strategies available to healthcare managers in Illinois to improve healthcare efficiency while reducing costs. Nevertheless, I asked peers or consultants experienced in the qualitative analysis process to review and discuss the coding process (Bradshaw et al., 2017). Also, extended and various time spent with the participants, interview techniques, and the transcripts, while writing the final report and using the words of the participants, are strategies used to strengthen the credibility of the study (Houghton et al., 2016).

The evaluation of rival explanations enhanced the internal validity of the study. By identifying competing explanations for phenomena and addressing and rejecting the explanations, case study researchers can improve the credibility of research findings (Yin, 2014). Also, Boddy (2016) noted that researchers risk the overture of a threat to the internal validity of their research if they do not recognize and examine plausible rival explanations for findings during the data interpretation phase. Investigators can achieve sincerity as an end goal can through self-reflexivity, vulnerability, honesty, transparency, and data auditing. In addition to being honest and vulnerable through self-reflexivity, another common practice of sincerity is transparency (Tracy, 2013). Transparency refers

to honesty about the research process. As a result, self-reflexivity, and transparency are two precious means by which to accomplish sincerity in qualitative research (Tracy, 2013).

I employed researcher bias identification as a second strategy for ensuring internal validity of the proposed case study. As discussed by Yin (2014), researchers' theories, personal values, or preconceptions might influence the structuring and conduct of their intended studies. Boddy (2016) noted that researchers, who do not recognize and manage their biases, might influence the responses of participants in studies and might corrupt data collection and analysis processes. Palinkas et al. (2015) argued that researchers must engage in self-reflection before the conduct of qualitative studies to identify and articulate attitudes about the research topics that may pressure the collection and analysis of data. Kolb (2012) created a list of identified biases and regularly reviewed the list throughout the preparation of study findings and conclusions to ensure that acknowledged researcher biases did not influence the analysis and presentation of research results (Cook, Holmboe, Sorensen, Berger, & Wilkinson, 2015). I conducted a personal assessment of biases before initiating data collection for the study.

As described by Stake (2005), member checking is a process in which researchers provide study participants with selected data products and draft findings and conclusions and ask the participants to comment on the accuracy of the materials provided. Boddy (2016) noted that member checking is a useful tool for eliminating the potential for distortion and misunderstanding of qualitative study findings and provides study participants with the opportunity to assess the credibility of research results and

conclusions. I used member checking as a third technique for establishing the internal validity of the qualitative case study.

By providing participants with copies of the transcripts of their interviews and the initial study findings and conclusions, I gained feedback regarding the exactness and integrity of research data collection and analysis efforts by allowing the participants to review transcripts and draft findings and conclusions. The comments provided by study participants helped to refine and fortify the final research results and findings and to strengthen further the internal validity of the study of healthcare managers' perspectives regarding strategies on how to achieve efficiencies of operations and to reduce costs.

The ability to transfer qualitative research findings or methods from one group to another or the applicability of the conclusions of a particular investigation in other contexts or with other subjects/ participants is called external validity in qualitative research (Merriam, 2015). Case study researchers concerned with external validity want to demonstrate the generalizability of their findings from the current case studies to other contexts (Yin, 2014). Gibbert and Ruigrok (2010) argued that case study researchers can enhance the external validity of case studies by providing rich descriptions of (a) the rationale for the selection of case study populations and (b) the details of case study contexts. Rich descriptions of study populations and contexts allow readers to understand the case study researchers' sampling decisions and to assess the degree of generalizability of research findings (Houghton et al., 2016). As noted by Bernard (2017), the external validity of social science research is dependent on the use of representative study samples

for the studied phenomena and on the rich description of the context in which the researchers conducted the studies.

I provided information about the geographic boundaries and demographics of the final sample population as well as the detailed descriptions of the study population used as the basis for the study of healthcare managers' perspectives regarding strategies on how to improve healthcare efficiency while reducing costs in the state of Illinois. By providing rich descriptions of the study population and the context for the collected data and research findings, I was able to offer readers with sufficient information to judge the generalizability of study results and conclusions to aspects of strategies to reduce costs while improving healthcare efficiency well beyond the boundaries of Illinois.

Two primary considerations are guiding the sampling methods in qualitative research: appropriateness and adequacy (Boddy, 2016). Therefore, researchers should be pragmatic and flexible in their approach to sampling and that an adequate sample size is one that is large enough to sufficiently address and answer the research question. In a sense, then generalizability is not sought by the researcher, and the focus is less on sample size and more on sample adequacy and the methods used in the study (Boddy, 2016; Houghton et al., 2016). In a qualitative exploration, the aim is not to attain a fixed number of participants instead it seeks to gather adequate depth of information as a way of thoroughly describing the studied phenomenon (O'Reilly, Caldwell, Chatman, & Doerr, 2014). As such, there are differences in how various approaches structure research questions, sample participants, and collect data (Palinkas et al., 2015) to accomplish richness and depth of analysis.

The qualitative researcher must be serious in maintaining a sense of awareness and openness to the study and unfolding results (Welch & Piekkari, 2017). Also, the researcher should make a conscious effort to follow, rather than lead, the direction of the interviews by asking the participants for clarification of definitions, slang words, and metaphors (Houghton et al., 2016). Apprentice and experienced qualitative researchers will agree that qualitative research is an experience of discovery and understanding that transcends one's knowledge and enriches the practice experience and evaluations of the quality of care (Welch & Piekkari, 2017). Attending to the rigor of qualitative research is an essential part of the qualitative research journey and provides an opportunity for critique and further development of the science.

Transition and Summary

Section 2 included the intent of the study, the population sample, research method and design, protocol for sampling and participation, data collection, and analysis of the data. The purpose of this qualitative, exploratory single-site case study was to identify the strategies that some healthcare managers use to improve efficiency while decreasing healthcare costs. The use of a case study protocol and procedure guide helped standardize each interview to achieve dependability in the study (see Appendix A). The various sources of information within the case study provided depth of the topic, providing support to identify phenomena and ensure quality (Yin, 2014). I used triangulation to create credibility between the sources (Constantinou et al., 2017; Holloway et al., 2016), as well as ensure the validity of the research (Fusch & Ness, 2015). The information yielded data allowing for complete analysis and review of the results. The goal of Section

3 is to present study findings from the evaluation and analysis of the case study. In addition to the overview of the study, Section 3 contains the applicability of the study findings regarding improved business practices, implications of social change, study recommendations, reflections, and study conclusions.

Section 3: Application to Professional Practice and Implications for Change

In this section, I present my research findings, discuss their application to professional practice, address their implication for social change, recommendations for action, and discussion of potential areas for further research. This section concludes with a reflection on my research experience during this study.

Introduction

The purpose of this qualitative, exploratory single case study was to identify the strategies that some healthcare managers use to improve efficiency while decreasing healthcare costs. I used a qualitative case study design to address the research question by gathering information through semistructured interviews with six managers at a single non-profit hospital in Illinois. I triangulated data from company documents, performance improvements plans, and transcripts of interviews with participants who included one medical doctor, one care manager, one nurse manager, one finance manager, one safety and risk manager, and one healthcare administrator.

Presentation of the Findings

The findings of this study addressed the central research question: What are the strategies that healthcare managers use to improve efficiency while decreasing costs? Face-to-face, semistructured interviews and information from company documents provided the data I analyzed in this study. Purposive sampling ensured the sample represented key participants whose knowledge and expertise applied to the study. Each participant signed an agreement to permit audio recording of the interviews. After comprehensively reviewing transcripts of the interviews, I entered the interview material

into ATLAS.ti software, which I used to analyze the data and visualize relationships in the data. I developed common themes from the information provided by the participants (see Yin, 2014). In this section, I show the connections between my findings and the conceptual framework that I outlined in Section 1. The conceptual framework for this study was CAS theory, which was appropriate for this study because a hospital is a large complex system.

The CAS theory is a scientific approach to complexity (Chiva et al., 2014; Rogers et al., 2005). As organizations are open to a multitude of stimuli, change processes become more complex. Ellis et al. (2017) noted that a CAS is a collection of individual agents where actions are interconnected (relationships) so that one agent's actions change the context for other agents (self-organization) who have the freedom to act in ways that are not always predictable (nonlinear).

I used CAS theory to help model the effects of different policy options in healthcare (see Sturmberg & Lanham, 2014). I found that alternative perspectives offered by other theories did not address the complex and changing nature of health systems or create new opportunities for understanding and revamping healthcare services (see Bishai et al.; 2014; Williams, 2015). Under those circumstances, healthcare managers should have a way of thinking about strategic change that matches the complex environments (Lichtenstein, 2014). The CAS theory could help healthcare managers, policy makers, planners, and researchers explore different and innovative approaches to reaching populations in need with effective and efficient healthcare services.

When examining the data, I identified strategies that are available to healthcare managers to improve healthcare efficiency while reducing costs. Emerging themes from the study were: (a) improving the accuracy of information and reports, (b) implementing precise and accurate information by analyzing operation flow and building loyalty, and (c) improving quality. I used the Atlas.ti software to perform code frequency and co-occurrence analyses of data from the six participants. Twenty-nine codes and 1,257 significant quotations supported three significant themes and helped me identify 12 strategies managers use to improve healthcare efficiency while reducing costs.

Theme 1: Improve the Accuracy of Information and Reports

Understanding revenue streams and projecting current and future operational costs is vital for organizations to improve the accuracy of information and reports that can be sent back to managers. Financial managers must project potential write-offs and accrue for the possible loss. Hospital staff, for instance, do not perform surgeries based on the patient's insurance plan in critical situations, such as open heart cases. Physicians, therefore, must determine the appropriate surgery based on standard medical care regardless of the patient's ability to pay. Participants identified four strategies related to the theme of improving the accuracy of information and reports. These four strategies were the following: (a) enhance budgeting techniques, (b) improve financial planning and purchasing decisions, (c) use HIT to improve the value of information, and (d) improve insurance reimbursements.

Strategy 1: Enhance budgeting techniques. Participant 3 monitors revenue, expenses, and labor when productivity and efficiencies result from the patient's medical

condition(s), type(s) of treatment, and insurance options for each case (see Table 3). Beginning with a budget, the participant measures price variances for equipment and supplies and patient volumes. For instance, higher equipment costs could result from machine malfunctions requiring repairs, which could relocate patients to other facilities or require more expensive imaging tests or pacemaker procedures. Participant 3 reported that the timing of invoicing is also crucial because it is difficult to “match revenues to expenses for the same patient mix.” The participant evaluates surgical services from general surgery to more invasive open-heart procedures where such specific conditions account for varying degrees of revenue.

Participant 6 reported being aware of the financial and budgetary constraints afflicting the hospital and suggested the problem is the most significant driver in Illinois over the last 3 years. The problem involves patients who are receiving treatment while payments from Medicaid are not forthcoming. Changes in the Medicaid program are unclear, and the full economic impact is uncertain. Recruiting physicians in rural areas is challenging. Participant 6 noted that “in a recent board meeting, reports show the hospital spent over \$600,000 in salaries in one month;” and suggested that the hospital hires temporary and interim doctors who are significantly more expensive; however, the cost might be offset if the timing and turnaround of documents correlate to a faster payment of services. When this takes place, it is essential to improve processes to make sure the paperwork is processed properly.

Strategy 2: Improve financial planning and purchasing decisions.

Fluctuations in revenues and expenses are commonplace, but Participant 3 indicated that

leaders must plan for variances. Patients sometimes do not have the financial means to satisfy the debt, especially because hospitals do not offer the same negotiated pricing to self-pay accounts. Supply costs are also increasing at an alarming rate. Therefore, chargeable supplies to patients are a significant cost identifier. Participant 3 noted that “if volumes are down, we also expect supplies to be down.”

Participant 3 reported that he planned for fixed costs, such as electricity and depreciation expenses, but that some expenses were variable, such as salaries. The participant declared, “We understand the fixed costs, which reoccur monthly will remain steady, but we still need to look for ways to reduce costs.” Participant 4 suggested that capital investments, increased infrastructure, building maintenance, and employee’s salary and healthcare expenses added significantly to the hospital’s overall costs. All participants agreed that receiving accurate and timely reports was important to monitor the status of issues that require attention (see Table 3).

Strategy 3: Use HIT to improve the value of information. Participant 1 reflected on several strategies, which he believed improved hospital efficiencies that would be vital for organizations to improve the accuracy of information. He discussed tactical measures the hospital adopted to build synergies between departments. One particular approach was to transition to an electronic medical record system (EMR), Epic, which is more suited for recording patient outcomes in a multi-hospital setting. The technology was a significant step aimed at building relationships with patients where timely and accurate protected health information is available throughout the enterprise.

Participant 1 noted, “Building synergies within the hospital's framework fosters optimal patient outcomes.”

Participant 2 noted the difficulty in understanding what strategies could help his staff gather information from physicians, anesthesiologists, surgeons, operating room staff, nurses, and admission representatives who treat and record historical medical information in software applications that do not feed to one another; therefore, the recorded information is not transparent. Participant 2 stated, “Our strategy was to move to an electronic medical records system because the platform could help us bridge that continuum.” Unfortunately, the cost is significant, somewhere in the neighborhood of \$55 million. The perception on the part of managers was that by improving the accuracy of information and reports, where data could be sent back to users, the organization would be in a better position to control costs.

According to Participant 4, reporting mechanisms are powerful instruments allowing leaders, managers, and administrators to control operations. The adoption of new computer technology would allow sharing of accurate health information in a secure and immediate framework. Improving the accuracy of information can be sent back to managers through the new HIT system to improve the efficiency of all operations (see Table 3). Participant 4 suggested that the organization spent “millions of dollars” upgrading the hospital’s information system to help unite data from current and newly acquired clinics and primary care doctor’s offices. EPIC is a universal healthcare data management system that includes secure access to patients’ medical records. Participant 3 stated, “The enhanced computer system could allow professionals to collaborate and

share data to better understand usage and prescriptions patterns, for example, to analyze data and develop best practices across health systems.”

Participant 4 noted that improving technology will also directly advance the health of the community, especially in rural area populations, because allowing physicians to access electronic medical records can save lives. Participant 5 also agreed with the other participants that migrating to the new IT platform, EPIC, will advance the medical staff’s ability to review all medications prescribed by caregivers spanning varying facilities, provide clear medical diagnosis and treatment plans electronically, and reduce billing errors. Participant 5 further suggested that setting goals and implementing processes and procedures based on reliable data helps to improve operations and ultimately increases patient satisfaction. Participant 6 purported that Epic is the most significant improvement the hospital has implemented in recent years. Participant 6 indicated that staff members moved from collecting clinical data through manual abstraction to extracting information electronically to maximize the highest level of reimbursement.

Not all contributors, however, migrated to the new platform. Electronic technology would allow case managers to improve productivity because using old; antiquated machines come with risks, such as time delays in sending and receiving faxed information and sharing of data. Participant 2 suggested that sending referrals to nursing homes, for example, is a significant step in transitioning patients for continuity of care.

Participant 2 could not begin to underscore the importance of other technology tools to reduce hospital costs and improve the fiscal deficits. Adoption of computer

technologies, such as the Silverview tablet, aids the Administration to assess activities related to a patient's length of stay costs. Data management is vital for hospital administrators to record and understand costs historically. Data also provide evidence of sound business practices. A patient's family will sometimes have to make a quick decision as to what facility to transfer one's family member to receive optimal care. Having an iPad with Silverview technology will allow the hospital to bring mobile access technology to the patient's room. Silverview enables hospital affiliations, such as nursing homes, the ability to upload what amounts to marketing information to include pictures, customer ratings, and amenities. According to Participant 2, the information allows patients and families a visual assessment of the facility such that decisions could become clear as to where to transition a patient if the patient needed to be moved.

Technology plays a large part in understanding business operations. Participant 3 noted that managing patient accounts to ensure billing and coding procedures were accurate and correct is part of the monthly billing reconciliation process. "It very well could be that somebody went in and put way too many zeros . . . It's up to us to see these, and then we could talk to the people who compile the charges, and they would review the account and get it fixed."

Strategy 4. Improve insurance reimbursements. To ensure the timing and turnaround of documents for the faster payment of services, Participant 3 noted the primary cost driver relates to insurance, such as self-pay, Medicare, Medicaid, and commercial insurance companies because each carries different reimbursement platforms. For instance, Participant 3 could not rule out that a patient might not receive a

favorable outcome if the surgeon selected a low-cost pacemaker compared to a more expensive device. Other costs derive from government regulations in support of hospital accreditation and reimbursement rates from insurance allowances.

Participant 1 noted, “Physicians and hospitals receive payment when the provider renders services; “Participant 2 realizes a financial shortfall because of how government insurance companies, such as Medicare and Medicaid, changed reimbursements. The volume-based, fee-for-service reimbursement process modified to correlating payments based on provider performance metrics (Sibley, Charubhumi, Hutzler, Paoli, & Bosco, 2017). “We have the best healthcare in the world, approximately 25% of the GNP at this point, but no one is paying. Participant 1 stated that “The State of Illinois owes us \$70 million! The State is bankrupt and is experiencing the worst debt service rating in the country, except for California.” Participant 6 showed that understanding how changes affect hospital processes to comply with the rules and regulations governing insurance reimbursements to ensure the timing and turnaround of documents for the faster payment of services, such as the Accountable Care Organization (ACO), is a concern. Participant 6 supports the development but worries that patients could “elect to drop out of an ACO at any time.”

Table 3

Improve the Accuracy of Information and Reports

	Strategy 1 Enhance Budgeting Techniques	Strategy 2 Improve Financial Planning	Strategy 3 Improve Technology	Strategy 4 Improve Insurance Reimbursements	
P1: Participant 1	23	P1: Participant 1	28	P1: Participant 1	11
P1: Participant 2	0	P1: Participant 2	9	P1: Participant 2	11
P1: Participant 3	78	P1: Participant 3	33	P1: Participant 3	19
P1: Participant 4	25	P1: Participant 4	6	P1: Participant 4	8
P1: Participant 5	7	P1: Participant 5	4	P1: Participant 5	1
P1: Participant 6	4	P1: Participant 6	15	P1: Participant 6	16
Total	137	Total	95	Total	66

Theme 2: Implement Clear and Accurate Information

Participant 4 showed that "Improving the timing and turnaround of documents is very important because we are living in a world where everything is moving rapidly and we need to document all that is happening as it is happening." Cost control documents such as operational plans and cost reporting worksheets help managers make buying decisions for large equipment purchases, which take special consideration. Leaders of the company must work to improve transparency by sharing data across hospital systems and departments. Reporting of monthly revenues and historical data is a significant window that allows managers to understand the state of the business (see Table 4). Managers identified four strategies related to the theme to implement clear and accurate information. These four strategies were the following: (a) quantify, analyze, and monitor the flow, (b) implement efficient process and adaptive scheduling for staff, (c) best practices for patient outcomes, and (d) build employee's loyalty and satisfaction.

Strategy 1. Quantify, analyze, and monitor the flow. Improving the reliability information contained in the reports is important, such as revealing actual usage, repairs, and patient volumes, because of the data factors into leasing or buying decisions.

Participant 3 emphasized that “We have to see how much the payback period would be, but we also look to see if it is more efficient and can it do the things expected. We don't want to buy the machine, and a year later it's outdated.” Reducing inventory and controlling drugs also affects a lean organization and has a positive effect on hospital efficiencies.

Equally important for accurate and timely reports is to analyze revenue shortages by reviewing patient procedures compared to standard costs. For instance, Participant 4 stated, “If revenues are down, but volumes are even, maybe the problem is in the patient mix?” Sometimes costs fluctuate based on the patient's room because, in a hospital, there are medical floors, surgical floors, and specialty floors, such as OBGYN and NICU pediatrics where the uninsured and underinsured population affect financial outcomes. Further, a review of discharge data could improve hospital efficiencies leading to strategies aimed at how physicians could treat more patients. Tracking a patients' length of stay compared to operational metrics helps Participant 5 understand hospital capacity. “Daily, we track how many people we were able to discharge before noon and how many rooms housekeeping staff cleaned.”

Participant 5 also measures ER patient wait-time reports of “more than an hour from admission to triage and admission to the first physician.” The data allows the participants the ability to ensure operations is flowing smoothly and adjust staffing based on peak times and also shift employees to other areas of the hospital when the demand rises. Participant 5 suggested that setting goals and implementing processes and procedures based on accurate and reliable data helps to improve operations and ultimately

increases patient satisfaction. Participant 4 stressed that managers have information to hold others accountable to meet spending limits. Participant 3 shared, “It's my job to hold people responsible for the numbers to help managers explain the variances and find out what's going on and why the hospital was not profitable or why expenses exceeded the budget.”

Strategy 2. Implement efficient process and adaptive scheduling for staff.

Managing staffing is also an important factor when scheduling patients to improve the timing and turnaround of documents. Balance is needed and essential to meet both the needs of the patients and achieve hospital efficiency. Participant 4 has direct patient care responsibilities and administrative oversight for a group of physicians that affords him direct control over costs related to patient care, such as approving patient testing and medications. Participant 4 acknowledged that “Treating the patient well and getting them improved quickly will get them out of the hospital more quickly, which is also an obvious efficiency driver.”

Problems surface, however, when employee's hours shift. Peaks and lows are hard for employees to understand. Participant 4 stated that “gone are the 9-5 regular shift timetables! Employees complain that. I need my 80 hours, my 40 hours each week so that I can get by on my bills, but labor is not that way anymore.” Participant 4 emphasized that controlling vacation and overtime is a critical aspect of a manager's role. “I'm going to need you to take off on low-volume days where you can take off without pay, or you can use a vacation day, but I don't need you to come to work because the patient census is low.” Staffing and patient volumes are something that Participant 5 manages daily. “If

our census goes down, we send people home on standby.” Participant 1 noted a concern where the company is not meeting salary targets because of the significant shortfall in nursing as employees are overworked because the hospital is short-staffed. Managers should strike a balance between an efficient patient and employee’s scheduling system to be in alignment with peaks and lows hours. Controlling costs will require the harmonization of different activities within the organization.

Harmonize the management processes. To improve the accuracy of information and reports that can be sent back to managers, Participant 1 indicated he hired an outside consultant to evaluate the internal and external administrative processes, such as billing, supply costs, and organizational structure to make recommendations for improvement. Today, the organization operates as a flat organization with much fewer levels of management to help control costs. The structure consists of an internal control strategy where “one person is responsible for all hospital locations based on the service line. For example, participant 1 suggested that the person in charge has a specific, clear knowledge base in cardiology, neuroscience, OB, cancer, pharmacy, radiology, and lab and imaging specialties.” The participant suggested having a centralized administrative structure throughout the organization and being self-insured helps in reducing costs.

Strategy 3. Best practices for patient outcomes. Improving the timing and turnaround of documents is very important because patient satisfaction rests on doctors treating patients in a timely fashion. Nursing and physician shortages are significant obstacles. The financial recording also consists of adopting metrics to show patient

volume for inpatient and outpatient surgical procedures. Outpatient surgeries help hospital leaders meet patient demands.

Physicians need to find efficient, low-cost options to offer patients to treat medical conditions, such as arthritic knees, joints, hips, and even heart surgery more efficiently; whereas, in the past, patients had few options. When a patient came in for treatment, the doctor performed a procedure where a catheter went up through the groin, and the patient returned to recovery for several hours such that nurses evaluated the patient's recovery to control bleeding and other post-operative procedures. With the advances in research and technology, medical monitoring tools have allowed physicians to treat patients with less aggressive procedures resulting in shorter hospital length of stay and less invasive procedures. Participant 1 provided an example where he showed, "A reduction in laboratory catheter procedures occurs where 83% of physicians complete surgeries radially. The procedure consists of inserting a diagnostic catheter in the patient's wrist, and a patient does not have to remain stationary and lay flat. Now, the patient can sit up and return home within a few hours. Hysterectomies are another medical procedure that has advanced. Woman opt for an outpatient procedure where 90% of our patients return home the same or next day; where 10-years ago, the hospital stay would be at least 3-days." Participant 1 collaborates with hospital affiliates to develop more services and hire more physicians for critical care specialties. "Adopting strategies where patients rate one's overall experience as exceptional is our goal." Innovation has improved medical procedures, and patient safety remains a great concern to healthcare stakeholders.

Enhance patient safety. Patient safety is a serious concern for hospital officials.

Participant 5 is a patient safety advocate who implemented several improvements to help mitigate potential risks. Training and emergency drills have been included in standard operating procedures to bring awareness to hospital inefficiencies and improved patient outcomes. Participant 5 stated, "Some nurses are not tall enough to apply effective pressure in emergency C-section procedures so adding stools in each surgical suite was used to help mitigate the problem." Ensuring medical supplies are available in each room to avoid delays was also an improvement that Participant 5 influenced. The nurses developed new techniques to improve the efficiency of services. Information drew mostly from feedback from peers and other professionals in a hospital setting. Healthcare efficiency is also about increasing patient's outcome by providing quality services to patients in a manner that they are not readmitted for the same diagnosis.

Avoid readmissions. Medicare reimbursements decline if a patient returns to the hospital 30-days after release. Hospitals also monitor readmissions for commercial payers because often, contracts are impacted. Readmissions also affect patient satisfaction. Participant 2 remarked, "They're not very happy if they go home sick and they come back sicker. That's not good for them." Case managers monitor hospital readmission reports and develop strategies to understand what actions could lead to higher efficiency safeguarding the health of the patient while in his or her home environment. Readmissions can affect the timing and turnaround of documents for the faster payment of services and affect hospital proficiencies if hospital beds are not available for new patient surgeries, especially when physicians tend to keep patients longer if admitted a

second time. Patient readmissions come with a great deal of dissatisfaction and also increase the level of risks as patients are exposed for a more extended period of hospital conditions.

Reduce patient risks. On the patient's side, people just do not want to go to the hospital or have routine checkups, but that stance might be counter-productive in controlling costs. Participant 3 suggested when patients do become ill, the cost of treating the problem ultimately increases when treatment is necessary because the condition is more severe without regular check-ups. Patients sometimes present symptoms for one condition only to learn the problem is more severe. Participant 3 stated, “You got a patient coming in because they're dizzy. You think it's an easy cure, and it's going to be a small case, but the dizziness ends up being a brain tumor, which requires extensive testing.”

Implementing optimal patient care strategies could also influence a patient's quality of care and length of stay. Participant 3 shared, “Our nurses are sensitive to patient conditions, which could negatively impact the patient. Hospital infections and pressure ulcers are common secondary medical conditions patients could encounter from being in the hospital. Nurses apply risk stratification techniques and interventions to identify and avoid potential problems.” Improved quality of feedback from staff helps in communicating with physicians to determine a treatment plan to manage patient risks, such as the loss of a limb or even death.

Strategy 4. Build employee's loyalty and satisfaction. Participant 3 purported, “Providing employees with optimal health coverage and medical services by providers

where out-of-pocket costs remain low will benefit employees and lead to an engaged workforce.” (see Table 4). Unfortunately, Participant 6 mentioned the organization did not realize significant cost savings when the hospital tightened spending by initiating a strategy to reduce employee benefits. The participant felt relief that lower-level employees did not shoulder the burden as all levels of employees experienced the decrease. People remained loyal to the organization even though employees were suffering significant cuts in benefits. Having staff backing the reduction in benefits requires a good line of communication and feedback to the staff and stakeholders. Participant 6 showed, “A savings of 4.6 million dollars for the current year rising from careful management of liabilities, such as malpractice, property, and automobile insurance. The surplus went to the operating budget shortfall derived from the State.” An observation that although employees did experience a change in benefit contributions, the savings did allow the organization to return \$800 to every employee in the form of a bonus.

Participant 2 shared, “Reducing employee workloads to include weekend coverage also helped to improve employee engagement.” Reducing case managers weekend hours and having case managers work on-call helped to minimize workload problems for staff. Staffing positions to match the needs of the department could result in hiring part-time entry-level employees versus degreed, full-time, skilled social workers. Mapping positions to real needs required quality input from all stakeholders and good feedback from staff.

Participant 1 noted, “An important strategy for improving patient satisfaction and outcomes is that every employee must commit themselves to the care and well-being of every patient and build lasting relationships where you build loyalty and brand.”

Participant 1 also mentioned, “People want to go to a place where they do not feel like a number; they want to feel like you are caring for them.” Hospitals that have lean processes, such as inventory control, removing wasteful processes and engaging employees will all lead to an increase in patient satisfaction scores and a reduction in costs. A successful lean processes program could only happen with an improved feedback from staff and stakeholders. Participant 1 suggested, “The government finally got it right where we need to be paying employees based on patient satisfaction.”

According to participant 1, training is a critical component to educate caregivers on selecting alternative medications to reduce costs and providing testing alternatives. Adopting employee safety measures, promoting a work environment where employees feel valued and empowering employees to do the job they were hired to do is an important step in creating an engaged workforce.

Table 4

Implement Clear and Accurate Information

	Strategy 1 Quantify, Analyze and Monitor the Flow	Strategy 2 Implement Efficient Processes and Adaptive Staff Scheduling	Strategy 3 Best Practices Patients Outcomes	Strategy 4 Build Employee's Loyalty and Satisfaction
P1: Participant 1	21	P1: Participant 1 6	P1: Participant 1 26	P1: Participant 1 18
P1: Participant 2	85	P1: Participant 2 20	P1: Participant 2 13	P1: Participant 2 2
P1: Participant 3	13	P1: Participant 3 37	P1: Participant 3 12	P1: Participant 3 0
P1: Participant 4	15	P1: Participant 4 12	P1: Participant 4 11	P1: Participant 4 1
P1: Participant 5	46	P1: Participant 5 32	P1: Participant 5 9	P1: Participant 5 3
P1: Participant 6	13	P1: Participant 6 14	P1: Participant 6 17	P1: Participant 6 5
Total	193	Total 121	Total 88	Total 29

Theme 3: Improve Quality

I have summarized the themes and strategies that are related to variables that would improve efficiency to lower costs, and related to a variable that would reduce efficiencies to improve quality. Addressing quality shortfalls is important to lead to better practices in the field (Welch & Piekkari, 2017). High quality results in richer insights and improves organizational outcomes (Bradshaw et al., 2017). Managers identified four strategies related to the theme to improve the quality of services. These four strategies were the following: (A) build synergies, (B) standardize processes to reduce waste, (C) reduce the length of stay (LOS), and (D) enhance referrals techniques through the community.

Strategy 1. Build synergies. Participant 1 discussed different strategies to build a solid future involving stakeholders in the healthcare system. Developing business relationships using preferred vendors was instrumental in creating competitive pricing structures for the hospital. The savings were substantial - “real costs and real money,” therefore, improving quality of feedback to staff and stakeholders is critical to the success of such a strategy.

Another example of a strategy aimed at developing synergy was implementing a co-management partnering agreement with an orthopedic physician group in the region. A high quality of feedback to staff allows the organization to maximize the outcome from such partnerships. Participant 1 felt the leadership of the hospital needed to agree with stakeholders on the goals and metrics for different specialties, such as hips, knees, and prosthesis resulting in substantial savings to the organization.

Strategy 2. Standardize processes to reduce waste. Participant 6 holds a high-ranking position and interacts with senior leadership to manage system-wide organizational opportunities. The participant also carries the responsibility for credentialing medical staff working for the hospital and securing independent credentials with insurance companies such as Blue Cross, Blue Shield, or Aetna. An opportunity for improvement arose because the review of credentials initially provided by insurance organizations was time-consuming and payment for services stalled. The participant noted the importance of implementing strategies to reduce waste as a result of knowledge learned from implementing a continuous improvement process such as transitioning to lean operations. In doing this, improving the quality of feedback to staff contributes to standardize processes to minimize waste. Participant 4 suggested the single most effective strategy he has on his agenda is to standardize processes, when possible, and provide evidence-based medical care to patients throughout the hospital system to reduce waste and improve hospital synergies. The lean process implemented in the hospital was also expanded to the nearby clinics that were part of the healthcare organization. Patients seen at those clinics spend less and benefit from the standardized lean process.

Use outpatient services to reduce costs. Improving outcomes also centers on making sure the patient received his or her surgical procedure in an optimal environment. An important factor is selecting an outpatient or a hospital setting with regards to government standards. Participant 2 stated, “Medicare shows certain procedures are only safely performed in a hospital setting.” Participant 4 is involved in creating policies and procedures related to patient care; thereby, eliminating daily variability by standardizing

patient procedures using evidence-based methodology. Quality feedback from staff is a key to reliable standardized procedures based on evidence-based methodology.

Participant 5 noted, “The facility receives 60 to 70 psychiatric type attempted suicide cases per month; although, the facility is not equipped to handle such circumstances. We’re not a psych facility so if they have a medical condition that brought them here; our costs increase by the need to provide a sitter 24/7 to keep the patient safe until the medical condition improves.” A strategy that could improve costs is to work to shift patients to an outpatient facility versus an ER setting for common ailments. All too often, an ER is a patient's first choice for primary and after-hours care. Waiting room delays seem to be a detriment as patients become angry and leave without treatment if physicians treat another patient’s critical needs first. Participant 5 suggested, “The pivot or triage process expedites and streamlines patient care, where Physician Assistants diagnose, order tests, and x-rays, and treat minor non-emergency health conditions. Before the pivot implementation, 8.4% of the patients left without being seen, and now they are at right around 1%.” The general trend that could improve patient care is to understand that communication throughout the continuum of the patient's diagnosis or stay rests with everyone. Systemwide continuous communication facilitates the implementation of the pivot system at the ER to help discharge patients promptly with less severe illnesses. Participant 1 acknowledged, “We must document timely and accurately the patient’s symptoms, test results, diagnosis, treatment, and drugs and dosages in a software solution, so duplication of tests or procedures does not take place

and where a clear historical record is available electronically from the cradle to the grave.”

Participant 2 stated, “Outpatient procedures are more cost-effective, so doctors must consider the option while evaluating one’s patient safety concerns.” Another variable is that case managers must determine the best discharge plan for the patient. Participant 2’s role as a case manager is to ensure the patient is receiving the right level of care for the proper length of stay and help hospital staff manage the length of stay.

Case managers facilitate patient transitions from an acute care setting to the next appropriate level of skilled care needs under physical therapy, occupational therapy, and physician recommendations. The process includes collaborating with insurance companies, medical staff, and admissions departments between current and next level of care. The transitioning, coupled with quality feedback from the patient and the patient’s family, is important as individuals move to skilled rehabilitation centers, home health care services, or hospice care. Participant 2 has been working as a case manager for over a decade and illuminated some changes over time. “Patients would remain in the hospital if the patient was not ambulatory or eating a regular diet.” In the infrastructure today, visiting nurses can help patients at home with basic care, such as bathing, and administer IV medications, so hospitals are sending patients home that are not entirely well. Striving to achieve efficiency and to ensure the patient’s best interest is still the guiding principle that underscores the best strategies to improve patient satisfaction and outcomes. According to participant 2, outpatient’s procedures are more cost-effective, therefore, to

ensure a coherent flow of patient from acute care to the next levels, managers have to monitor census.

Increase census. Participant 4 suggested, “Increasing patient volumes and reducing the costs of taking care of patients by improving efficiencies” in a hospital setting are the optimal solutions to combating healthcare cost-cutting initiatives. Participant 4 felt that patient schedulers and leaders must manage patient volume efficiently such that patients could receive treatment in a timely fashion; otherwise, patients will seek treatment elsewhere. Improving the quality of feedback to staff and will increase efficiency and permit patients to be treated promptly. Participant 4 stated, “We market our hospital in several areas, TV, radio, newspaper, and social media to help increase patient volume, but we do not have control over inpatient volumes.” Although driven from insurance company reimbursements, participant 4 stressed that “We work to incorporate best practices, such as reducing patient hospital s and increasing outpatient services to make our organization successful.” Hospitals will not turn patients away because of one’s inability to pay; therefore, as leaders in the healthcare industry, increasing volumes and the patient census is a high priority.

Strategy 3. Reduce the length of stay. As some participants manage administrative functions to improve the hospital’s financial health, other participant’s positions center on reducing a patient’s length of stay by performing outpatient testing to avoid readmission rates (see Table 5). Participants felt achieving both goals requires improving quality of feedback. Care coordination activities contribute to reducing

patient's length of stay and avoiding delays by managing required testing activities through the provision of home care and rehabilitation services.

As a case manager, Participant 2 suggested, "Close monitoring of a patient's length of stay would help improve hospital efficiencies. Improved quality feedback from staff originates through communication huddles or meetings between physicians, nurses, and case managers. Quality feedback from staff is a good strategy to make sure the patient is receiving the proper treatment and illuminating any potential risks to the patient's health." Participant 4 stated, "If there is not a risk to the patient, maybe we shouldn't be doing the surgery in the hospital setting. Maybe we should discharge and do it later on as an outpatient."

The patient's length of stay seems to be an important factor in my research on improving efficiencies to reduce costs rather than to attempt to simply control costs. Participant 4 acknowledged that the implementation of an early morning patient discharge process increases facility access by "opening up beds earlier" and reduces nursing requirements. Participant 4 purported, "Releasing patients early in the morning will free up beds for new patients, rather than holding the patient in the emergency room until space opens." Freeing the beds early in the morning to maximize occupancy and patient flow in the ER requires good coordination and quality feedback to and from staff.

From a case management perspective, the goal is to resolve a patient's illness for the initial diagnosis and not extending the length of stay treating other unrelated conditions, which could result from secondary or tertiary diagnosis. Hospitals staff must continue to evaluate a patient's length of stay to ensure the care is resolving the patient's

current condition. If patients remain in the hospital, other secondary conditions could surface, such as infections or accidents relating to falls or preventable medical errors. Reducing hospital costs include providing the right care at the right time. Participant 5 suggested, “Reducing the length of stay is something the hospital managers aim to control as a significant cost reduction opportunity.”

A diagnosis-related group (DRG) is a statistical system of classifying any inpatient stay for the determination of payment. The DRG classification system segments possible diagnoses into more than 20 major body systems and separates them into almost 500 groups for the rationale of Medicare reimbursement. Participant 5 noted that “with the DRG situation, you get paid a certain amount no matter if the patient is here 3-days or 20-days, and so any efficiencies in care and treatment that would safely decrease the stay is important.” Hospitals managers achieve goals by improving collaboration and quality of feedback to staff and all hospital’s stakeholders.

Strategy 4. Enhance referrals techniques through the community. Participant 4 confessed that an important strategy is to employ many physicians in the community because doctors will refer services to health systems, which could drive outpatient treatments. Unfortunately, outpatient services might result in decreasing hospital revenues. Another approach is that hospital staff could increase the number of tests and avoid strategies aimed to discharge patients early when insurance coverage is on a fee-for-service (FFS) basis that would result in decreased revenue. Unfortunately, insurance company leaders understand a fee-for-service payment model results in too many services and testing because payments increase from the quantity versus the quality of

care (Brosig-Koch, Hennig-Schmidt, Kairies-Schwarz, & Wiesen, (2016). Participant 4 also stated that outpatient services would supplement lost revenue if in-patient hospital volume decreases. Offering patients extra amenities such as closer parking, decreasing wait-times for testing, and offering same-day appointments in the hospital's new surgery units also could help build patient volume.

Table 5

Improve Quality

	Strategy 1 Build Synergies	Strategy 2 Standardize Processes to Reduce Waste	Strategy 3 Reduce the Length of Stay (LOS)	Strategy 4 Enhance Referrals Techniques through the Community
P1: Participant 1	51	P1: Participant 1 12	P1: Participant 1 18	P1: Participant 1 7
P1: Participant 2	33	P1: Participant 2 8	P1: Participant 2 61	P1: Participant 2 5
P1: Participant 3	38	P1: Participant 3 62	P1: Participant 3 19	P1: Participant 3 2
P1: Participant 4	15	P1: Participant 4 27	P1: Participant 4 14	P1: Participant 4 0
P1: Participant 5	14	P1: Participant 5 28	P1: Participant 5 16	P1: Participant 5 0
P1: Participant 6	11	P1: Participant 6 8	P1: Participant 6 8	P1: Participant 6 0
Total	162	Total 145	Total 136	Total 14

Complex Adaptive Systems

Complex adaptive systems (CAS) are collections of many different components interacting in nonlinear ways without any external supervisory influence (Sturmberg, Martin, & Katerndahl, 2014). Multiple, diverse, and interdependent elements are present in healthcare organizations in the form of hundreds of specialized clinical healthcare professionals and the administrators who attempt to help organize them into effective care delivery teams and units (Begun & Thygeson, 2015). The behavior of specific agents cannot explain the behaviors of a complex adaptive system; instead, complex adaptive systems show emergent behaviors (Sturmberg, Martin, & Katerndahl, 2014). The agents often diverge in their reporting and incentive structures. The specialized support and technical service workers add to the diversity of the delivery setting. Putting a system of

multiple, diverse, interdependent components into motion, interacting to deliver healthcare, creates a huge level of complexity (Begun & Thygeson, 2015).

Healthcare managers struggle to implement strategies that might improve services while decreasing costs. I offered a feedback model to elucidate the causal relationships between the external drivers to the complex adaptive system, for the implementation of strategies to improve efficiency while decreasing costs by healthcare managers. A feedback model identifies a visually simplistic method of depicting relationships between elements occurring within a system (Kulkarni, 2017; Wang, Han, & Yang, 2015). Variables and associations among system elements in the feedback model identify the relationship between choices and results. Interactions among system components create causal loops, which demonstrate foundational problems exclusive of whole system complexities (Mella, 2015; Strauss & Borenstein, 2015).

Direct relationships (+) represent changes from X to Y in the same direction. If X increases then Y increases; if X decreases then Y decreases. Inverse relationships (-) represent changes from X to Y in the opposite direction. If X increases then Y decreases; if X decreases, then Y increases. The feedback model first presents external variables, which might affect any system regardless of complexity or simplicity. From the analysis of the findings of my study, I identified three emergent themes that affect both sides of the research problem: improve efficiency to lower costs or reduce inefficiency to lower costs. The strategies enacted by healthcare managers are influenced by external factors. When the enacted strategies increase, the external factors necessary to improve efficiency to lower costs increase in a (+) direct relationship. When the enacted strategies decrease,

the external factors necessary to reduce inefficiency to lower costs decrease as well in an (-) inverse relationship. The findings strongly suggest the identification and implementation of best practices within the organizational process lens of systems thinking (Medvedeva, 2012; Stephens, 2013; White & Fortune, 2012).

Feedback Model Legend

Direct Relationship

When object X increases, object Y also increases. A direct relationship is denoted by the “+” sign along the green relationship flow.

Inverse Relationship

When object X increases, object Y decreases and vice versa. An inverse relationship is denoted by the “-” sign along the red relationship flow

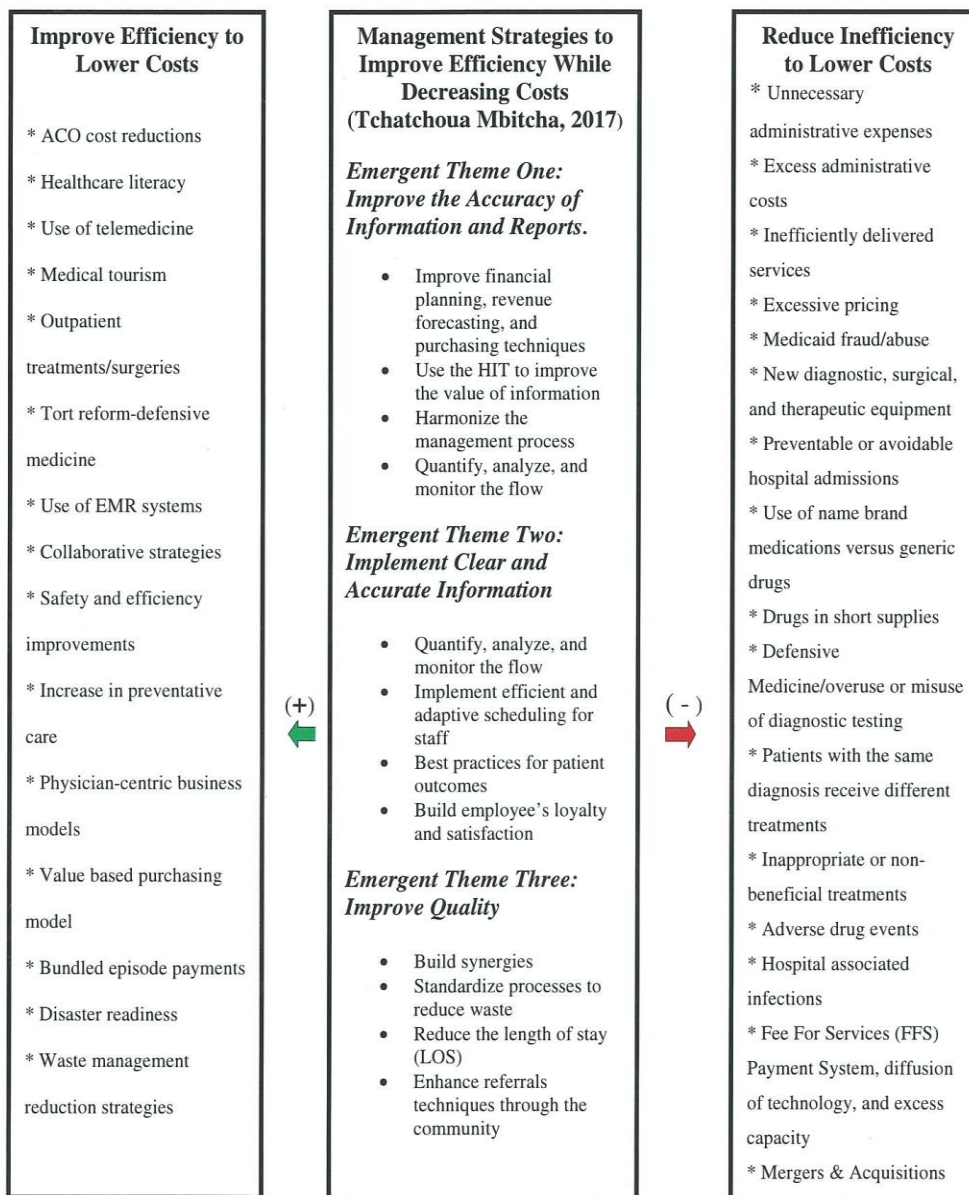


Figure 3: Feedback Loops in a Complex Adaptive System Network Associated with the U.S. Healthcare Costs. Model developed in consultation with K.D. Gossett (2017).

My study might provide the first academic opportunity to analyze the healthcare efficiency improvement and costs reduction in the United States through the lens of complex adaptive systems. The total cost of avoidable spending for all healthcare services exceeds \$666.7 billion dollars and represents 21.5% of the \$3.1 trillion spent on yearly healthcare expenditures. The total potential savings exceed \$391 billion and represent 12.6% of the \$3.1 trillion spent on yearly healthcare expenditures.

I conducted my study in a hospital setting. From the analysis of the findings of my study, I identified three emergent themes that affect both sides of the research problem: improve efficiency to lower hospital costs or reduce inefficiency to lower hospital costs. According to the National Center for Health Statistics, in 2015 hospital care represented 32.3% of the national health expenditures for an amount of \$1 trillion (CDC, 2016). The potential savings in total hospitals costs is \$478.26 billion, which means 47.8% of the total cost of hospital care.

Table 6

Summary of Potential Hospital Care Savings and Percentages:

Categories	Hospital Care Savings (Billions dollars)	Percentages (%)
Inappropriate or non-beneficial testing/treatments	192.00	40.14
Unnecessary administrative expenses/excess costs	180.00	37.63
Care coordination problems	35.00	7.32
Hospital-associated infections	33.00	6.90
Preventable medical errors	17.10	3.57
Safety and efficiency improvements	12.16	2.54
Preventable or avoidable hospital admissions	9.10	1.90
Total	\$478.36	100%

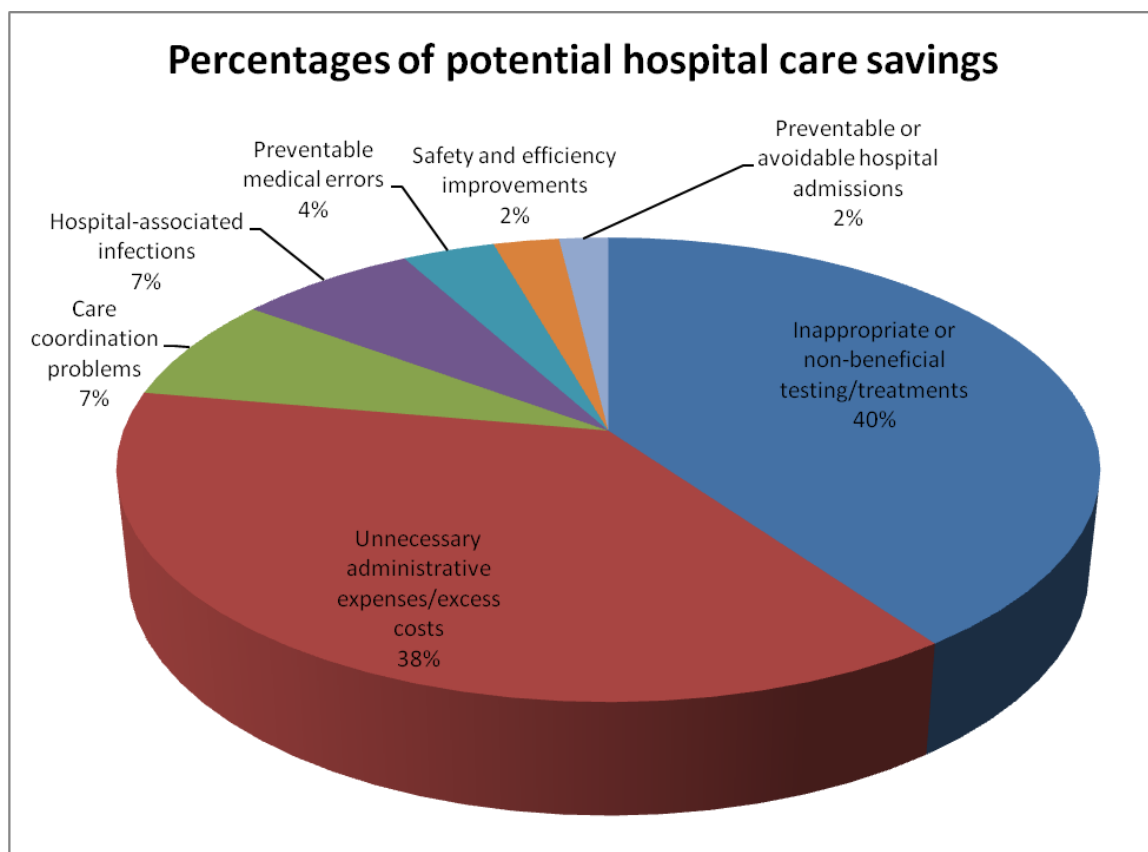


Figure 4. Percentages of potential hospital care savings

Even though my study focused on strategies available to managers to improve efficiency while reducing healthcare costs, we need to be mindful of Hostetter and Klein (2011) reminding us that “the primary measure of healthcare performance is whether it helps patients recover from an acute illness, live with a chronic disease, and face end of life with dignity.”

Applications to Professional Practice

Healthcare leaders such as care practitioners, medical service providers, administrators, insurers, and the U.S. government have been finding ways to deliver efficient, appropriate, and cost-effective healthcare services. In a complex system as the

U.S. healthcare system, many entities must harmonize their activities and work accordingly to achieve this goal. The specific business problem is that some healthcare managers have limited strategies to explore ways to improve efficiency while reducing healthcare costs. After conducting an exhaustive search of scholarly literature and other academic publications, I could not find any direct alignment between the present study and previous academic studies. I have found that there is a lack of research studies from a system's perspective exploring strategies to improve efficiency while reducing healthcare costs.

The findings from this study provide an important exploration of the strategies used by healthcare managers to increase efficiency and decrease costs. The findings illustrated the perceptions of the healthcare managers in the Midwest region of the United States. Findings from this study highlight some strategic decisions from healthcare managers under three major emergent themes: (a) improve the accuracy of information and reports, (b) implement clear and accurate information, and (c) improve quality. Improving healthcare efficiency to lower costs or reducing healthcare inefficiency to lower costs requires that managers implement strategies that could influence external factors.

The strategies sustaining the improvement of accuracy of information and reports include improvement in financial planning and purchasing decisions, improvement in insurance reimbursements, enhancement in budgeting techniques, and the usage of the HIT to improve the value of information. The strategies sustaining the implementation of precise and accurate information include the quantification, the analysis and monitoring

of the flow, best practices patients outcomes, the implementation of efficient and adaptive scheduling for staff, and the building of employee's loyalty and satisfaction. The strategies sustaining the improvement of quality include building synergies, standardizing processes to reduce waste, the enhancement of referrals techniques through the community, and the reduction of the length of stay.

Healthcare managers who are interested in improving the efficiency of their services at a lower cost can view the strategies in this study as a guide to implementing better strategies within their healthcare organization. These findings are relevant to improving healthcare business practices to provide a detailed discussion of the applicability on the professional practice of business. This subsection provides a rich academic argument of why and how the findings are relevant to improve business practice.

Implications for Social Change

The implications for social change include effective healthcare management strategies to improve efficiency and reduce costs. The findings of my study have the potential to considerably reduce medical waste considered with the lowest estimates in only six categories such as: (a) overtreatment, (b) failures of care coordination, (c) failures in execution of care processes, (d) administrative complexity, (e) pricing failures, and (f) fraud and abuse. The aging population with rapidly increasing costs of healthcare and the growing burden of chronic and prolonged diseases could benefit from a new system's approach to healthcare delivery and strategies contained in my study. Ultimately, my goal for this study is to impact the quality of services and to bend the

trajectory of the healthcare cost curve. The measure of success to the degree of positive social change brought about through the findings of this research study correlates to the quality of new informed decisions and strategies in the healthcare system. The findings of this study also have the potential to provide solutions to promote social change by providing solutions that may improve overall organizational performance within a hospital setting and could increase improvements in communities, institutions, societies, cultures, and in individuals that could affect social change or behavior.

Recommendations for Action

The findings from this study can serve as a foundation for recommendations for healthcare managers to implement within their organization's strategies to improve efficiency while decreasing costs. A more in-depth analysis of external factors influencing their organization and preventing them from delivering efficient and affordable care is crucial to implement a set of strategies. The use of a system's thinking approach enables managers to identify interrelationships and parts of the system instead of individual patterns.

The system-wide process of implementing strategies from the findings of this study is the necessary recommendation to act upon related factors. Additionally, feedback consistency must improve to support repeatable informed and actionable decisions; therefore, a needed recommendation is to build skill sets and tools to extract reliable feedback from sources utilizing staff and stakeholders. The strategies to implement should focus on: (a) improving the accuracy of information and reports, (b) implementing clear and accurate information, and (c) improving safety and quality of services.

The findings from this study are relevant to healthcare managers. Utilizing the recommendations, the managers could implement strategies designed to improve healthcare efficiency and lower costs. As an agent for positive social change, I am dedicated to ensuring the dissemination of the study findings at local, regional, national, and international conferences and academic or trade publications. I will be available to healthcare stakeholders seeking clarification or deeper understanding of the findings.

Recommendations for Further Research

Recommendation for further research as a result of my study are the following:

(a) make sure that healthcare managers participating in a similar study are knowledgeable and experienced regarding efficiency improvements that can be made, (b) provide comprehensive up to date and objective information during the interview process, (c) recruit enough participants who will express best practice technology strategies, and (d) extend the study nationwide as the issues of healthcare affect all persons living in the United States. These recommendations are in line with the assumptions, limitations, and delimitations identified in Section 1.

Recommendations for further research also include a mixed methods approach to quantify the results of the strategies described in this study. Data from additional studies might consist of measurements of costs related to the non-implementation of a given strategy. Data could also provide the savings related to the implementation of a given strategy to improve efficiency and reduce costs. Another recommendation for further studies is to broaden the research to include other variables consisting of access to healthcare services, safety and quality of healthcare services, and patient and stakeholders

satisfaction of healthcare services. Kumah, Ankomah, and Antwi (2016) reminded us that “the ability to change, adapt, and evolve is the only sustainable competitive advantage in today’s healthcare environment.” (P. 20).

Reflections

My objective for conducting this study was to contribute to the development of creating positive change that affects business strategy within a health system and in any organizational unit of management and technology. The fact that I did not have any healthcare background at the beginning of this process was even more exciting and challenging for me. My goal was also to build my academic and professional competencies as a researcher exploring strategies available to healthcare managers to improve efficiency while reducing the costs of their services. At the beginning of this journey, I planned to study all of the three components of the healthcare iron triangle (access, cost, and quality). I was then thinking of increasing access to services, improving quality while decreasing costs. My initial choice went towards a quantitative method and then mixed methods. I had to refine the scope of my study because of time constraints and my desire to explore the issues deeply. I, therefore, decided to conduct a qualitative single case study. My experiences have emphasized my determination of working more alertly to achieve something great and through the persistence of attaining excellence given me a reason to always strive for more.

Engaging study participants in an open and probing manner enabled me to explore healthcare managers’ strategies to improve efficiency and reduce costs in their facility. I remained mindful of personal biases throughout my conduct of the study. I retained a

focus on capturing and representing the opinions and perspectives of participants in an unbiased manner. All participants of this study acknowledged that improving healthcare efficiency and reducing costs requires a system-wide approach. The CAS approach was, therefore, well suited as the conceptual framework for this study. Participants came from various departments in their organization and were dealing with issues related to costs and healthcare efficiency. The data I gathered and analyzed were in alignment with the literature review.

This program has enhanced my knowledge of key concepts in the U. S. healthcare system and has enriched my experience in managing a healthcare setting especially with the mission of improving efficiency while reducing costs. Participants provided me with some strategies available to them to achieve their goals. Additionally, completing this program and conducting this qualitative study with a CAS conceptual framework, I understand that the whole is greater than the sum of its parts. The knowledge and the experience gained from this process lead me to assert that I can efficiently contribute as a professional in the field of healthcare management.

Conclusion

The study concluded a thorough exploration on how healthcare managers set strategies to improve efficiency while reducing costs. The study is valid research that will instill social change by making a difference within the healthcare industry. Overall the themes emerging from the study were related to the strategies the organization is using to reduce costs and improve efficiency. These strategies verify my research and validate the literature review about healthcare efficiency and costs within a CAS

conceptual framework. Healthcare management practices are of importance, especially at this moment in the United States when the Congress is still looking for better ways to improve or repeal the ACA.

The research method allows me to conduct the study in a thorough manner using a qualitative approach. This research might make a significant contribution to social change and possibly change or provide better insight to the current methods of how the healthcare industry approaches efficiency and costs. Healthcare managers who are interested in delivering quality healthcare at a lower cost should be knowledgeable of the details of this study. The findings of this study apply to professional healthcare practices and have implications for promoting positive social change. Having a healthcare system that delivers efficient healthcare at a lower cost for patients is a key element to the entire industry.

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Appendix A: Case Management Interview Protocol

A-Data Collection Procedures (Semistructured Interviews)

1. Contact via email potential participants from list of known healthcare managers in Illinois.
2. Send these potential interview participants an initial contact email.
3. Semistructured interview participants will meet the following criteria: (a) Hold a managing position in a hospital, (b) have specific knowledge and expertise relevant to the management of healthcare costs and improvement in healthcare services in the state of Illinois, (c) do not belong to any protected class, (d) available for a twenty minute interview, and (e) no physical or mental handicap.
4. If these individuals agree to participate in the study, they will receive an informed consent form to review and sign, which they will be asked to sign and return via email.
5. Create a folder for each participant (folder to include informed consent, interview questions, and template for recording answers).
6. Schedule a time and place, at the convenience of the participants, for the interviews to take place. Explain to the participants that the interview will not last longer than twenty minutes.
7. Be available 20 minutes before the start of the interview to answer any concerns or questions.
8. Data collected from the semistructured interviews will come from a preplanned set of questions intended to obtain their opinions improving healthcare efficiency while reducing costs.

9. Review the objectives of the study with participants and remind them that the interview will be digitally recorded using a laptop application called Sound Recorder, to allow for transcription later.
10. Ensure participants have signed the informed consent form.
11. Assign a number to each participant.
12. Provide privacy and comfort of the participant
13. Reinforce that participant can stop at any time, information is confidential, and if a participant does not understand the question, the participant can ask for clarification
14. Begin discussion with participants, using preselected interview questions.
15. Take notes of conversation.
16. Transcribe notes with LiveScribe Echo pen.
17. At the time of interview ask them to validate interpretation of interview conversation.
18. Place participant's consent and hand copy transcript in participants' folder.
19. Enter data into the software Atlas.ti
20. Save all hard copy data for 5 years in a secure location in a fireproof safe and electronic data in a password protected with encryption software in a laptop.
21. Destroy all data after a 5-year period.

B. Data collection tools

1. Interview questions
2. Laptop application called Sound Recorder for digitally recording the conversation
5. LiveScribe Echo pen to transcribe the conversation
6. Researcher field notes

7. Case study (folders)

8. Atlas.ti software

9. Microsoft word

C. Outline of Case Study Report Contents

1. Overview of study

2. Presentation of the findings

3. Applications to professional practice

4. Implications for social change

5. Recommendations for action

6. Recommendations for further study

7. Reflections

8. Summary and study conclusions

Appendix B: Confidentiality Agreement

Name of Signer:

During the course of my activity in collecting data for this research: Strategies to Explore Ways to Improve Efficiency While Reducing Healthcare Costs, I will have access to information, which is confidential and should not be disclosed. I acknowledge that the information must remain confidential, and that improper disclosure of confidential information can be damaging to the participant.

By signing this Confidentiality Agreement I acknowledge and agree that:

1. I will not disclose or discuss any confidential information with others, including friends or family.
2. I will not in any way divulge copy, release, sell, loan, alter or destroy any confidential information except as properly authorized.
3. I will not discuss confidential information where others can overhear the conversation. I understand that it is not acceptable to discuss confidential information even if the participant's name is not used.
4. I will not make any unauthorized transmissions, inquiries, modification or purging of confidential information.
5. I agree that my obligations under this agreement will continue after termination of the job that I will perform.
6. I understand that violation of this agreement will have legal implications.

7. I will only access or use systems or devices I'm officially authorized to access and I will not demonstrate the operation or function of systems or devices to unauthorized individuals.

Signing this document, I acknowledge that I have read the agreement and I agree to comply with all the terms and conditions stated above.

Signature:

Date:

Appendix C: National Institutes of Health (NIH) Web Based Training Program**Certificate**