2018

Waste Management Minimization Strategies in Hospitals

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This is to certify that the doctoral study by

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2018

Abstract

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MSW, University of Houston, 1993

BSW, The Ohio State University, 1981

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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April 2018

Abstract

During the delivery of healthcare services, hospital employees use enormous amounts of water, energy, and nonbiodegradable carcinogenic plastics. In the U.S., hospital staff generate an average of over 7,000 tons of waste per day at an average cost of $0.28 per pound for the disposal of regulated medical trash, which if efficiently managed or reduced, could result in substantial cost savings. Using the organizational learning and the transaction cost economics theories as the conceptual frameworks, the purpose of this qualitative case study was to explore strategies healthcare leaders used to minimize their waste management operational costs. Data were collected using semistructured interviews with 4 managers at a healthcare system in the Midwestern United States and reviewing financial documents as well as the participants' hospital website. Based on the thematic analysis, 4 primary themes emerged: (a) engaged leadership, (b) incorporate sustainability into the mission, vision, and values of the organization, (c) create an organizational culture of sustainability, and (d) innovation. Because society's health is largely dependent on the environment around them, these findings could assist hospital leaders in the implementation of cost-effective waste management strategies and contribute to positive social change.

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Dedication

I dedicate this doctoral study to the two most important men in my life, my husband Mike and my father, Walter Knopp, M.D. Without my husband's encouragement, patience, and emotional support, I would not have had the strength to persevere. Although my father passed away before the completion of my doctoral journey, I will forever be grateful for his love, guidance, patience, generosity, and the pride he always had in me. Without his support throughout my life, I would never have had the courage to pursue my goals. Dad, I miss you very much and wish you could have been here, so I could thank you in person.

Acknowledgments

Throughout the last 2 years of my doctoral journey Dr. Steve Roussas has been extremely supportive and compassionate, encouraging me to press on through the difficult life events along the way. I am grateful that I was fortunate enough to have you as my chair and for the guidance you provided me. I would also like to thank my committee members Dr. David Moody and Dr. Scott Burrus, for your review, comments, and suggestions which assisted me in writing a clear and concise document.

Furthermore, I would like to acknowledge the organization that allowed me to conduct this research, particularly the CEO emeritus. The world is a better place because of leaders like you. Thank you for letting me learn from you, I am extremely grateful.

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Section 1: Foundation of the Study

Background of the Problem

Healthcare organizations (HCOs) consist of highly complex networks of professionals that must continuously interact in mutually supportive exchanges to deliver high-quality patient care (Doyle, Kelliher, & Harrington, 2016). At the same time, healthcare is a highly regulated industry (Caniato, Tudor, & Vaccari, 2015) with limited budgets, and where expenses continue to rise (Wormer et al., 2013). Scholars and environmental groups are now recognizing that HCOs are part of the overall global environmental sustainability problem due to the enormous resources they consume and dispose of and the hazards to the public's health they pose (Caniato et al., 2015; Wormer et al., 2013). Wormer et al. (2013) reported, as an industry, HCOs are the second largest producers of trash in the United States (U.S.). Resource consumption, chemical and hazardous waste production, and climate change are all associated with the intensification of diseases around the globe (Azmal et al., 2014). There is a paradoxical relationship between the healthcare industry's mission of promoting human health and its contribution to environmental decline and the spread of disease (Azmal et al., 2014; Hemchandra et al., 2014)

In the U.S., the media frequently reports healthcare reform and the associated issues surrounding the long-term sustainability of HCOs as topics of national concern. HCO leaders face difficult decisions regarding how they can reduce operational expenses while improving the quality of care at their facilities. Finding innovative ways to minimize operational expenses without reducing the quality of care and services could

help HCOs gain a competitive advantage. In this qualitative study, I explored strategies healthcare leaders used to minimize their waste management operational costs as one method of reducing operational expenses and thus, improving sustainability.

Problem Statement

During the delivery of healthcare services, hospital employees use enormous amounts of water, energy, and nonbiodegradable carcinogenic plastics (Pinzone, Lettieri, & Masella, 2015). In the U.S., hospital staff generated an average of over 7,000 tons of waste per day at an average cost of $0.28 per pound for the disposal of regulated medical trash, which if efficiently managed, could result in substantial cost savings (Wormer et al., 2013). The general business problem is that hospital leaders/managers lack the strategies to reduce their waste management operational costs. The specific business problem is that some hospital managers in the Midwestern U.S. lack the strategies to minimize their waste management operational costs.

Purpose Statement

The purpose of this qualitative single case study was to explore strategies some hospital managers of medium-sized hospitals in Midwestern U.S. use to minimize waste management operational costs. The participants in this study were hospital leaders, managers, and an employee who have successfully adopted strategies to minimize waste management operational costs at their facility. The findings of this study could assist hospital managers to minimize hazardous waste treatment costs, energy consumption, carbon dioxide (CO_2) gas emissions, decrease waste sent to landfills, and generate additional revenue streams. The implication for positive social change may include

reduced service costs and improvements to the health and well-being of the people in the area hospitals serve.

Nature of the Study

I selected the qualitative methodology for this study. When researchers consider which methodological framework is appropriate for their study, they must consider the nature of the phenomenon they are investigating to adequately discover and explain that phenomenon (Park & Park, 2016). In a qualitative method of discovery, the researcher asks open-ended questions to gain an in-depth, holistic view of the topic (Park & Park, 2016; Yin, 2014). Therefore, I used the qualitative method because I wanted to ask open-ended questions to gain a comprehensive view of the subject. In quantitative studies, researchers test hypotheses to find correlations, relationships, and causality (Park & Park, 2016). The mixed method is a combination of the quantitative and qualitative method (Yin, 2014). Because I did not intend to collect empirical data to test a hypothesis, find correlations, relationships, or causality, a quantitative or mixed method methodology was not appropriate for this study.

In a single case study design, the researcher uses exploratory questions seeking to gather data directly from participants to gain an understanding of complex situations using a holistic and real-world perspective (Yin, 2014). Therefore, I used a single case study design to uncover the strategies hospital leaders used to minimize waste management operational costs. I did not choose an ethnographic design for this study because researchers use this study design to explore specific cultures and the values, interactions, and beliefs of the individuals within that culture (Barratt, Ferris, & Lenton,

2015; Park & Park, 2016). I also did not use a phenomenological study design as researchers using this design to explore human phenomena and lived experiences to improve the cultural, social, economic, and welfare conditions of a particular group of individuals (Grant, 2014). Therefore, neither the ethnographical nor the phenomenological designs were appropriate for this study.

Research Question

What strategies do hospital leaders use to minimize waste management operational costs?

Interview Questions

1. What was the impetus for beginning to address waste management issues at this facility?
2. How has your role at the hospital helped to facilitate decreased waste management operational costs?
3. What waste management strategies have you implemented?
4. How have these strategies helped minimize costs or improve the related processes at this facility?
5. What were some challenges you met while implementing these strategies?
6. How did you overcome these challenges?
7. What additional waste management strategies have you considered that would help you minimize operational costs?

Conceptual Framework

The organizational learning theory (OLT) and transactional cost economics theory (TCE) provided the conceptual framework for this study. The concept of organizational

learning emerged in the literature in 1963 (Doyle et al., 2016). Over the decades, multiple scholars have provided a range of perspectives to enhance and further the theory (Doyle et al., 2016). To effectively meet the demands of healthcare reform, HCOs must develop behaviors that facilitate integration among professional groups (Carswell, 2012). Leaders must be visionary and create a shared culture that is innovative and motivated to change (Carswell, 2012). Carswell (2012) posited that the key characteristics of OLT, when applied to healthcare, are (a) experiential learning, (b) dialogue, (c) transference, and (d) increased knowledge leading to changes in behavior. As applied to this study, Carswell stated that OLT theorists espoused that collaboration, innovation, and creativity, often beginning at the individual level, are necessary to move the organization toward change. TCE was the original work of Commons (1934) and Coarse (1937). Williamson (1979) extended the theory to explain in economic terms, how firms structured and designed their organizations (as cited in Martinez & Dacin, 1999). Williamson posited that organizational transactions have both visible costs (resources) and maintenance (or intangible) costs. Martinez and Dacin (1999) reported that scholars of TCE theory concluded that changes within organizations occurred because of minimizing transaction costs. OLT and TCE explain how organizations improve performance and healthcare leaders develop strategies that minimize operational expenses.

Employing the combined theoretical frameworks of TCE and OLT provided me with the theoretical lenses through which to view efficient waste management strategies hospital leaders used to reduce operational costs. The findings of the study could contribute to a better understanding of how hospital leaders can apply OLT and TCE to

the development of cost-effective waste management strategies. Therefore, both OLT and TCE theories were relevant to exploring what cost-effective waste management strategies hospital leaders used to decrease their operational costs.

Operational Definitions

Corporate social responsibility: Voluntary business activities that contribute to the betterment of society through social, economic, and environmental sustainability practices (Arend, 2014).

Environmental sustainability (ES): Actions that support efforts to reduce climate variation, environmental degradation, and pollution (Patrick, Kingsley, & Capetola, 2016) that create healthier, safer, and greener workplaces and communities (Practice Greenhealth, 2016).

Green: Environmentally beneficial, less damaging products, services, and actions (Practice Greenhealth, 2016)

Regulated medical waste: Hazardous waste generated by medical personnel in the process of performing patient-related services that are listed, categorized, and regulated by the U.S. Environmental Protection Agency (Roberts, 2015)

Stakeholder: Anyone who has an interest in an organization, financial or otherwise, and the consequences of the decisions made by it or on its behalf (Schillo, Isabelle, & Shakiba, 2017).

Sustainability: Creating business processes that meet existing needs without compromising the ability to meet future needs (Conway, 2014).

Assumptions, Limitations, and Delimitations

Assumptions

Assumptions in research are notions researchers considered as true, but lack verification and, therefore, authenticity (Semenova & Hassel, 2014). In this study, my first assumption was that environmentally sustainable waste management practices scholars reported in the literature and by organizations that are proponents of environmentally sustainable healthcare activities can, in fact, reduce operational costs in hospitals. My second assumption was that the participants would answer the interview questions with honesty and provide all the necessary information to understand how their waste management strategies helped them minimize operational costs. I also assumed that data collected through observations and financial documents were true and accurate. Finally, I assumed I would be able to achieve data saturation that could provide me with all the information necessary to understand what strategies hospitals can use to minimize their waste management operational costs.

Limitations

This study consisted of one health care system in the Midwest region of the U.S. One of the limitations of a single case study design is the inability to generalize the findings to other hospitals or hospital systems in the U.S. or other countries. Personnel motivations and qualifications, including leadership style and the ability to create a corporate environment that supports environmental engagement by healthcare workers, may limit the ability for other healthcare systems to implement cost minimizing waste management initiatives. Recruiting multiple hospitals that have implemented

environmentally sustainable waste management strategies could have provided greater validity and support to other healthcare leaders considering such initiatives. In addition, not being able to embed myself into the HCO and observe their processes was a limitation of this study.

Delimitations

Delimitations denote the boundaries where a study will take place, which the researcher decides prior to conducting the study (Semenova & Hassel, 2014). The study participants included the managers and leaders of a healthcare system located in the Midwestern U.S. that had successfully adopted strategies to minimize waste management operational costs.

Significance of the Study

Contribution to Business Practice

Scholars and environmental groups are now recognizing that HCOs are part of the overall global environmental sustainability problem due to the enormous resources they consume and the waste they produce. Carnero (2015) reported that HCOs generate all existing classes of waste, 20% of which is toxic and requires specialized (regulated) waste disposal techniques. Medical waste disposal is costly and places individuals and communities at risk for contamination by hazardous waste materials such as blood or body fluids, mercury, and other toxic substances (Carnero, 2015). Using effective environmental sustainability strategies could provide both tangible and intangible rewards for the HCOs that implement them.

Implications for Social Change

The development of sound organizational sustainability programs by HCOs has numerous potential benefits to an organization when aligned with their mission and vision. The mission statements of some HCOs include declarations that the organization's purpose is to promote the health of their patients and communities (Azmal et al., 2014; Block, 2016; Russo, 2016). Because society's health is largely dependent on the environment around them, supporting a healthy community is also the ethical responsibility of an HCO (Hemchandra et al., 2014). Hemchandra et al. (2014) proclaimed the irony that the purpose of HCOs is to promote the health and treat disease when in fact they can pose a substantial health risk due to the environmental degradation from improper waste management and disposal practices.

Research on cost-effective waste management strategies for hospitals could result in the establishment of improved waste management strategies for other hospitals. Some business leaders have expressed concerns that environmentally sustainable waste management strategies are too expensive to adopt (Arend, 2014) and have therefore chosen not to implement them. HCOs that implement environmentally sustainable waste management strategies could help reduce the amount of waste sent to landfills, minimize the risk of spreading infectious diseases, and contribute to the global fight against climate change. In summary, research on hospital leaders who have effectively implemented cost-effective waste management strategies may improve communities' health and therefore contribute to positive social change.

A Review of the Professional and Academic Literature

The purpose of this qualitative single case study was to explore the strategies hospital leaders in the Midwest used to minimize waste management operational costs at their facility. The goal of this study was to gain an in-depth holistic view of effective strategies hospital leaders can implement that will minimize operational costs associated with the handling, treatment, and disposal of waste at their facility.

The purpose of a literature review is to systematically gather comprehensive information from the relevant extant literature on the topic under review and to critically analyze, synthesize, and summarize the existing body of knowledge in relationship to the conceptual frameworks used in the study (Ward-Smith, 2016). Therefore, I have organized the literature review by themes presented in the literature relating to health care waste management (HCWM). Although I did not discuss every strategy researchers have presented, I have reviewed the key strategies that were most frequently reported by scholars in the literature. In the first section, I presented the conceptual frameworks of OLT and TCE and how these theories apply to HCWM. In the second section, I introduce the topic of waste management in healthcare and discussed the tangible and intangible benefits for the hospitals that implement proper waste management strategies that I found in the literature. In the third section, I report the findings of the strategies scholars found that hospitals implemented to create efficient waste management practices and describe the challenges hospitals encountered that scholars found needed resolution in order to implement cost-effective waste management strategies in hospitals.

The source of the scholarly journals I used in this literature review emanated from ProQuest, EBSCO, Google Scholar, Medline, PubMed, Science Direct, and Thoreau Multi-Database search sites. I used the following keywords as search terms: *healthcare*, *hospital*, and *strategies*, combined with *waste management*, *environmental*, *environmental management*, *pro-environmental behavior*, *green*, *recycle*, *recycling*, and *biomedical waste*. Additional search terms for the conceptual framework were *organizational learning theory* and *transactional cost economics*, combined with *performance*, and *literature review*. I also used the previously mentioned keyword search terms in various combinations that allowed for finding articles on waste management strategies in other industries outside of the healthcare arena. I used 137 references in this literature review of which 119 were peer-reviewed journal articles published in the last 5 years or seminal works. In addition to scholarly articles, I obtained information for this study from additional references including books and websites.

To ensure resource credibility and maintain topic currency, I sought to gather information primarily from seminal scholarly works and scholarly peer-reviewed journal sources published within the last 5 years. In addition, I used a few credible governmental or nongovernmental (NGO) agency websites as references. In total, I used 137 sources, 97.05% were from scholarly peer-reviewed journals or seminal works, 13.76% consisted of peer-reviewed articles prior to 2013, and an additional 2.91% were either from governmental or NGO websites or were not peer reviewed (see Table 1). Thus, 86.13% of the references used in this study met credibility and currency requirements.

Table 1

Percentage of Scholarly Peer-Reviewed References Published Since 2013

Source	Total	Percentage
Peer-reviewed journal articles or seminal works	132	97.05%
Peer-reviewed journal articles published before 2014	15	10.94%
Governmental and Non-Governmental Websites	4	2.91%
References or articles not peer-reviewed	0	0.00%
Total all sources	137	

Organizational Learning Theory (OLT)

Doyle, Kelliher, and Harrington (2016) reported that the term organizational learning first emerged in the literature in 1963. Previous works by Chandler (1962) and multiple other scholars provided the basis for the initial attempts to develop, define, and differentiate OLT and its components (Fiol & Lyles, 1985). Fiol and Lyles (1985) and Doyle et al. acknowledged that despite the acceptance of OLT and importance to the strategic performance of firms, there had been little consensus on a definitive model that has received full acceptance in the scholarly literature. However, scholars agree that organizational learning is a social process where workers learn through interaction with others (Berta et al., 2015). Fiol and Lyles (1985) posited that learning is multilevel, requiring multidirectional input from individuals, groups, and leaders in the organization. This multilevel dynamic learning process occurs in a social context where members interact to share knowledge and create meaning about the effects of new knowledge on practice (Berta et al., 2015; Doyle et al., 2016). Berta et al. (2015) noted that

performance improvements resulted from experiential learning where workers adapt work routines through accrued experiences and where workers select and retain improved work performances. Innovation is the result of learning and adaption within organizations which many scholars considered as the key to creating a competitive advantage and firm sustainability (Berta et al., 2015; Kalmuk & Acar, 2015). Thus, while researchers are not in complete agreement on a precise definition of OLT, the concept of organizational change through shared experiences, performance improvements, and innovation has generated approval within the scholarly literature.

In the OLT literature, scholars discussed that learning in organizations occurs on two levels: single loop and double loop learning. Fiol and Lyles (1985) informed that single loop learning occurs at a lower level and consists of rudimentary behaviors and skills. Unlike lower-level learning which focuses merely on repetition of previous behavior, multilevel learning is a higher level of learning referred to as double loop learning (Fiol & Lyles, 1985). Double loop learning is the examination of underlying processes and the application of corrective actions to improve those processes (Berta et al., 2015). Berta et al. (2015) stated that organizational learning developes through a process of double loop learning where actors within the organization respond to process and performance errors or failures by questioning the organization's goals, assumptions, or values. As such, double loop learning incorporates understanding, insight, and explanation and turns these into actions (Berta et al., 2015). Double loop learning results in a change in values and norms of performance within the organization as well as strategies and assumptions (Berta et al., 2015). The result is a convergence of the

organization's objectives and strategies. This new knowledge is then manifested in the behaviors of workers and work routines (Berta et al., 2015). Berta et al. argued that facilitation in organizations contribute to organizational learning and provided explanations for its success. Organizations that engage in higher level learning are better equipped to learn from failures and adapt their processes to create superior outcomes.

Many scholars linked organizational learning to firm performance. In single-loop learning, experiential learning enhances organizational performance (Berta et al., 2015). Performance improvements are the results of adaptive or double loop learning, which arise from accrued work experiences and routines (Berta et al., 2015). Feng, Zhao, and Su (2014) reported that an organization's level of commitment to learning, shared vision, open-mindedness, and knowledge sharing was paramount to superior firm performance. Kalmuk and Acar (2015) posited that organizational learning increases a firm's competitive advantage, enhances employee job satisfaction, and ties it to several financial measures. Therefore, organizational performance is a continuous cycle of learning, adapting, and improving performance within the organization.

While several scholars argued that a single broadly accepted theory of organizational learning has not yet emerged, others argued that this perception may be due to the lack of integration among OLT researchers (Doyle et al., 2016). Additionally, other scholars affirm that inconsistent terminology and unclear underlying assumptions or definitions of OLT might be the cause for the lack of acceptance of a single construct (Berta et al., 2015; Doyle et al., 2016; Fiol & Lyles, 1985). Nevertheless, OLT is a popular theory among scholars in framing their studies in healthcare and environmental

sustainability practices (Hovlid, Bukve, Haug, Aslaksen, & von Plessen, 2012; Sujan, 2015; Yang, 2016).

Transactional Cost Economics (TCE)

TCE was the original work of Commons (1934) and Coarse (1937), although not named as such (Martinez & Dacin, 1999). Martinez and Dacin (1999) informed several scholars contributed their ideas to the theory. Bucheli, Mahoney, and Vaaler (2010) reported that Chandler (1962) provided compelling narratives regarding how businesses evolved over the last 150 years. Chandler transformed business history by melding social science theory together with economics, sociology, management, and organizational theories (as cited in Bucheli, Mahoney, & Vaaler, 2010). Bucheli et al. stated that Chandler (1977) asserted that theories that failed to account for the role of administrative coordination were "far removed from reality" (p. 860). In addition to Chandler, Bucheli et al. argued that previous economists failed to relate the role of administrative coordination in the processes of production and distribution and the firm's ability to increase profitability.

In a review of the historical business progression in American in the 19th and early 20th centuries, Chandler (1977) furthered the works of Commons (1934) and Coarse (1937) and developed the theory of TCE as a single theoretical lens through which he viewed the evolution of business (as cited in Bucheli et al., 2010). Defined as an analytical perspective to evaluate alternative strategies for exchange and production transactions based on their perceived potential costs, several scholars have viewed TCE theory in terms of asset specialization and internal or external cost associated with

outsourcing or maintaining in-house profit (Bucheli et al., 2010) and alliance outcomes (Judge & Dooley, 2006). Bucheli et al. (2010) defined transaction costs as costs associated with the production and oversight (management) of the exchanging of goods and services over time and between organizations. Stephens, Manrodt, Ledlow, Wilding, and Boone (2014) defined TCE more simply as all costs associated with participating in the market. By defining transaction costs in this way, the authors perceived transaction costs from an analytical perspective based on the potential costs of business transactions (Bucheli et al., 2010). Determining what transaction costs are associated with waste management processes can provide hospital leaders with a better understanding of how to improve them.

Another scholar credited with furthering the development of TCE theory was Williamson (1979). Bucheli et al. (2010) noted that while Williamson (1985) and Chandler (1977) had common ground in describing the TCE theoretical perspective, there were also considerable differences. The most notable difference between Williamson's and Chandler's theoretical perspective of TCE is that Williamson viewed the transaction as the unit of analysis whereas, for Chandler, it was the organization's tangible and intangible (people) assets (Bucheli et al., 2010). While Williamson and Chandler differed on their perspectives of TCE, both contributed to the development of the theory and provided valuable insights into how hospital leaders can develop waste management strategies.

Many scholars have criticized the views of Chandler (1977) and Williamson (1985) and TCE as encouraging or reinforcing opportunistic behavior by organizations

(Bucheli et al., 2010; Judge & Dooley, 2006). However, Judge and Dooley (2006) posited that the level of opportunistic behavior on the part of one or more alliance partners (or the perception of opportunism, real or not) could degrade alliance performance and therefore, organizations would be unlikely to behave opportunistically. Because a firm's sustainability requires the optimization of its flow of goods and services while minimizing the costs associated with governing these transactions, the perception of some scholars is that TCE leads to bad management practices (Ketokivi & Mahoney, 2016). Ketokivi and Mahoney (2016) refuted this claim and asserted that this view is a distortion of the theory and instead suggested that TCE has at its core the concern for efficiencies by avoiding the waste of both efforts and resources. Therefore, in order to determine the most efficient manner of doing business, firms must determine whether to buy or make a product or service based on the examination of all the transaction costs associated with it no matter how large or small those transactions might be. Stephens et al. (2014) emphasized that in the analysis, firms should pay special attention to the hidden transactional costs particularly when considering outsourcing.

The TCE theory offered a critical lens through which I viewed hospital leader's decision criteria in determining the appropriate waste management strategy for their organization based on their perceptions of the tangible and intangible costs associated with each transaction. Using the TCE informs researchers how organizational leaders evaluate each operational function and the associated transaction costs. The decision to use a recycling, reuse, or disposal strategy, choosing and contracting the vendors or service providers, purchasing capital equipment or structural changes to existing areas

within the hospital will all have different transaction costs and benefits hospital leaders will need to weigh. In addition, leadership must consider the costs associated with strategies related to these strategies such as staff education and training for the newly implemented protocols and procedural changes to the hospital's operational or infrastructure changes, should that take place.

In addition to transactional costs, hospital leaders should learn new ways of performing. The OLT furthered my perspective of how hospital leaders developed and learned new strategies through work experiences and routines. Because of the regulatory and political climate in which HCOs must operate, HCO leaders must continuously change and make improvements to their processes (Berta et al., 2015; Feng et al., 2014). This continuous cycle demands that they learn, adapt, and improve their operational processes to achieve efficiencies (Berta et al., 2015; Doyle et al., 2016).

Conceptual Frameworks and Their Application to Waste Management

Few scholars linked the conceptual framework of OLT to the adoption of environmentally sound waste management practices (Feng et al., 2014; Kasim, 2015). Researchers who previously attempted to link firm performance with the adoption of environmental management systems (EMS) offered mixed results (Feng et al., 2014). However, Feng et al. (2014) argued that this inconsistency was due to the researcher's lack of strategic alignment connecting EMS adoption with a firm's learning orientation. Per Feng et al., four dimensions define a learning organization: (a) commitment to learning, (b) shared vision, (c) open-mindedness, and (d) knowledge sharing. Feng et al. argued that an organizational culture that values and promotes learning is crucial to

gaining a competitive advantage. In their study of 214 Chinese manufacturing firms, Feng et al.'s concluded that a proper fit between EMS and organizational learning orientation resulted in a competitive advantage and enhanced firms' performance. Therefore, although little research was conducted on waste management using OLT as a conceptual framework (particularly in the healthcare industry) scholars have noted that learning in organizations is an essential component to firms' fiscal sustainability.

Fiol and Lyles (1985) and Naranjo-Valencia, Jiménez-Jiménez, and Sanz-Valle (2015) also discussed the importance of a corporate culture in fostering organizational learning and performance improvement. An organization's long-term survival depends on its ability to grow and adapt to environmental changes to remain competitive (Fiol & Lyles, 1985). This concept implies that the firm should have the capacity to reflect on past behaviors and learn and improve from them (Fiol & Lyles, 1985). In an organization where the leadership has created a strategic posture with goals and objectives consistent with learning will influence its employee's behavioral and cognitive development and move it towards action taking (Fiol & Lyles, 1985). Employees working in an organization that has a strong positive organizational culture behave in innovative ways, further enhancing firm performance (Naranjo-Valencia, Jiménez-Jiménez, & Sanz-Valle, 2015). In this way, organizational culture affects a firm's strategic direction and therefore its capacity to learn and the boundaries for decision-making based on how it perceives the environment in which it operates (Fiol & Lyles, 1985).

Hovlid, Bukve, Haug, Aslaksen, and von Plessen (2012) applied OLT to factors that influenced the sustainability of improvements during their hospital's redesign of the

elective surgery pathway. Hovlid et al. stated that the redesign project aimed to improve cancellation rates that negatively affects patients, diminished the quality of care, wasted resources, and increased healthcare costs. Hovlid et al. reported that their findings demonstrated that employees developed an improved and more in-depth understanding of their clinical operations and their interdependencies while undergoing the redesign process. These results indicated that change in the clinician's mental models of their clinical systems was the result of double loop learning where a new understanding emerged from the dynamic process in which staff shared information, reflected on the changes, and related them to their everyday work circumstances (Hovlid et al., 2012).

Several scholars (Jacobs, Rouse, & Parsons, 2014; Lindsey, 2016; Tung, Baird, & Schoch, 2014) applied the process of learning to organizational performance and growth without linking these to OLT and instead suggested other theories that support successful organizational change. Jacobs, Rouse, and Parsons (2014) asserted that change in organizations was the result of a process they named *the implementation pathway*. Jacobs et al. constructed the implementation pathway by combining several theoretical constructs (organizational theory, dominant coalition, economic theory, and the theory of communicative action) with "managerial constructs around management control and performance measurement" (p. 73). Lindsey (2016) concluded that organizations needed to develop a learning culture that fosters improvisation and experimentation that improve inefficiencies and minimize the use of unwarranted resources. Tung, Baird, and Schoch (2014) reported that the more team members shared knowledge and experiences, the stronger the organization became in their environmental learning processes which further

enhanced employee motivation and commitment to environmental sustainability practices.

In TCE theory, the emphasis is on efficiency-seeking (Martinez & Dacin, 1999), which has been the focus of concern in the healthcare sector as healthcare cost continue to rise and uncertainties over the ever-changing insurance reimbursement landscape increase (Block, 2016). Similar to the difficulty with establishing a link between the OLT and HCWM, I was unable to find evidence in the literature that directly linked the conceptual framework of TCE to the adoption of HCWM practices in hospitals or the healthcare industry. Indirectly, however, several scholars reported that costs (perceived and actual) associated with the implementation of environmentally sustainable waste management practices had interdicted organizations from doing so (Agar, 2015; Ali, Wang, & Chaudhry, 2016a; Ali, Wang, & Chaudhry, 2016b; Arend, 2014; Askarany & Franklin-Smith, 2014). Several researchers cited that upfront purchase costs have prohibited many organizations from establishing sustainability practices (Agar, 2015; Coffey, Tate, & Toland, 2013; Dhillon & Kaur, 2015). Therefore, although scholars have not directly connected the adoption of waste management strategies with TCE, it's practical application can be found in the accounts of several scholars' descriptions of the challenges faced by organizations who sought to implement them.

However, Qiu, Shaukat, and Tharyan (2014) linked environmental and social disclosures to lowered transaction costs and reported that firms that disclosed their social responsible acts had higher than expected growth rates and cash flows. Wagner (2015) indicated that divestment of problematic business activities related to regulatory

requirements or focusing on pollution prevention created more value for the company and reduced transaction costs. Ali et al. (2016) studied hospital waste quantification and disposal techniques in Pakistan to determine which method caused the lowest environmental burden. In that study, Ali et al. reported that leadership takes into consideration the transaction costs of purchasing and using the equipment when determining the best possible scenario. Environmental impact is, therefore, one of the costs associated with the decision to implement one practice over the another.

Hospital leaders must address a variety of issues when considering whether to implement environmentally sound HCWM practices. Ali, Wang, and Chaudhry (2016b) considered transaction cost, such as the incentive of a positive reputation and liability concerns, against the disincentives of capital costs and perceived increased work burden of staff. Clarkson, Fang, Li, and Richardson (2013) reported concerns regarding the firm's environmental burden, eliminating potential regulatory violations, and litigation as incentives. Arend (2014), Bujak (2015), Caniato, Tudor, and Vaccari (2015) and Coffey, Tate, and Toland (2013) expanded on these findings by stating environmentally sound HCWM practices also increased efficiencies and resulted in cost reductions for the organizations that implemented them. In addition, Arend, Caniato et al., and Block (2016) argued that environmentally sound HCWM practices also improve safety, quality, and reduced wasteful activities. Block further explained that managing natural resources efficiently (eliminating wasteful practices) was an effective strategy to help minimize escalating health care costs. Without deliberating over these hidden transaction costs

when considering the implementation of HCWM practices, healthcare leaders would fail to account for potential costly expenses that might occur without them.

Introduction to Waste Management

The environmental sustainability initiative became of interest to business entities with the development of the World Commission on Environment and Development (WCED) in 1987 (Conway, 2014). The WCED defined sustainability as "development that meets the needs of the present without compromising the ability of future generations to meet their needs" (Conway, 2014, p. 378). Lloret (2016) argued that conceptually, the term corporate sustainability originated from the broader concept of sustainable development which is parallel to corporate social responsibility. The WCED's definition broadens the business definition of sustainability beyond that of the ability of a firm to generate wealth for its stakeholders and gave sustainability a corporate social responsibility (CSR) context.

There is growing interest among scholars on environmental sustainability issues as evidenced by the increasing numbers of articles published on the subject on a global level in recent years. As the environment became a concern, public and governmental scrutiny focused on large corporate manufacturing organizations considering them to be at the root of environmental degradation. Coffey et al. (2013) stated that the majority of research on environmental sustainability practices (ESP) focused on larger business who scientists considered as the primary contributors to environmental pollution. However, Coffey et al. argued that because of the sheer number of small and medium-sized enterprises (SME) that make up most of businesses activity and employment

opportunities in the majority of countries around the globe, further research needed to focus on successful ESP practices of SMEs. Although there is an abundance of literature concerning ESP in large manufacturing businesses, the scholarly literature relating to how the healthcare industry has addressed environmental sustainability (ES) is much less pervasive, particularly as it relates to efficient waste management strategies hospital leaders can implement and the effects those efforts had on their facility's financial performance, particularly in the U.S. (Carnero, 2015).

As the subjects of climate change, water shortages, and pollution have drawn intense interest globally (particularly in the last decade), businesses have come under increasing scrutiny by the public, governmental, and NGOs to reduce consumption and recycle, or reuse resources. In 1970 the U.S., established the Environmental Protection Agency (EPA) to protect the public's health through protective environmental regulations (Roberts, 2015). Although in the U.S. the debate among politicians continues to rage about the true effects of pollution, scientific evidence continues to reveal the adverse impact of pollutants on population health and global warming (Agar, 2015; Huffling & Schnek, 2014).

Waste Management in Healthcare

During the delivery of healthcare services, healthcare professionals consume enormous amounts of water, energy, and non-biodegradable carcinogenic plastics (Carnero, 2015). Medical waste disposal is costly and creates the risk of contaminating individuals and the environment since much of medical waste contains hazardous materials such as blood or body fluids, mercury, and other toxic substances. The lack of

awareness of proper HCWM disposal and treatment procedures by healthcare workers has resulted in "hospitals becoming epicenters of spreading disease rather than working toward eradicating them," especially in developing countries around the globe (Sengodan, 2014, p. 378). The direct and indirect risks of improper incineration or dumping of healthcare waste (HCW) has a direct impact on the environment by contaminating soil and ground water which in turn can result in related illnesses to populations in the surrounding communities (WHO, 2016). Governmental and NGOs all over the globe are reacting to the threat pollution has on their population's health by creating guidelines and regulations that HCOs must abide by (Ali Wang, & Chaudhry, 2016; Arend, 2014; Baati, Mellouli, & Hachicha, 2014). Table 2 displays the types or categories of waste generated by hospitals as outlined by WHO (2016). In 2009, the U.S. EPA created standards that impact how most healthcare facilities dispose of infectious waste and limit greenhouse gas emissions and other forms of pollutants (Roberts, 2015; Wormer et al., 2013). It is essential that hospital leaders develop innovative methods of reducing operational costs, while at the same time meet the ever-increasing regulatory requirements that amass substantial economic burdens on their institutions. Of the 22 regulatory acts and three executive orders, (although all apply to healthcare facilities) Roberts (2015) stated that the most relevant to hospitals are the Resource Conservation and Recovery Act (RCRA) and the Clean Water Act (CWA). The RCRA seeks to protect the health of the public and the environment from the hazards of waste disposal, energy, and natural resource consumption and ensure the proper management of toxic substances (Roberts, 2015). The Federal Government initially enacted the CWA in 1948 as the

Table 2

Waste by Type

Waste Type	Description
Infectious waste	Waste contaminated with blood or body fluids human or animal. Examples include diagnostic samples, laboratory cultures, and waste from autopsies; waste from patients or animals in isolation; disposable equipment.
Pathological waste	Tissue, organs, and body parts from humans and contaminated animals.
Sharps	Needles and syringes, disposable surgical instruments, and blades.
Chemicals	Disinfectants, solvents used in laboratory preparations, toxic metals in medical devices (mercury) and batteries.
Pharmaceuticals	Expired, unused, or contaminated drugs and vaccines.
Genotoxic waste	Waste that is extremely hazardous, mutagenic, teratogenic1 or carcinogenic, such as cytotoxic drugs used in cancer treatment and their metabolites
Radioactive waste	Waste containing a radioactive substance such as radioactive diagnostic material or radiotherapeutic materials.
Non-hazardous or general waste	Waste that poses no biological, chemical, radioactive, or physical hazard such as paper, plastic, diapers, and other general household type waste. Much of this waste is recyclable.

Note. WHO (2016)

Federal Water Pollution Control Act and later expanded it in 1972 when the act became known by its current name (EPA, 2017). For hospitals, the CWA regulates how hospitals can discharge wastewater used during the provision of healthcare service.

Hospital leaders should ensure their waste management practices are environmentally sound and meet the EPA regulations. Healthcare facilities generate all forms of hazardous waste (HW) (Carnero, 2015). Per the EPA (2017), there are two broad categories of HW: *Characteristic* and *Listed* (Roberts, 2015). The *Characteristic*

category includes waste that is ignitable (including liquids containing 24% alcohol or that has a flashpoint above 60 degrees Celsius), reactive, corrosive, and toxic (Roberts, 2015). The *Listed* categories are F (waste generated from processes), K (industrial waste), P (acutely toxic commercial chemical products) and U (commercial chemical products such as formaldehyde used to preserve body parts) (Roberts, 2015). In the U.S., healthcare entities that fail to implement successful compliance programs are subject to fines, such as those imposed on Walgreen's, CVS Pharmacy, and Walmart, whose penalties ranged from $800,000 to $22.5 million (Roberts, 2015). Fines such as these could bankrupt most healthcare facilities.

Because a portion of health care waste is toxic or hazardous to human, plant, and animal populations, most countries have laws regulating how entities must treat and dispose of it. Each method has pros and cons to their use. Table 3 displays some of the pros and cons of each of the treatment and disposal methods found in the literature. Several studies addressed how HCOs assessed their best options for the treatment and disposal of infectious healthcare waste (IHW) to determine which method best met the needs of their organizations. Baati, Mellouli, and Hachicha (2014) utilized a multicriteria decision-making process (MCDA) to assess the best method to treat and transport IHW for 12 regional hospitals in the Governorate of Sfax, Tunisia. The four criteria used to determine which method of disposal of IHW for all of the hospitals were: (a) legislative policy compliance, (b) risk assessment and environmental impact reduction, (c) processing flexibility (robustness against failures), (d) and economic criterion. In their

Table 3

Waste Treatment and Disposal Techniques Found in the Literature

Waste Type	Description	Pros & Cons
Autoclaving (Steam Sterilization)	Treated with dry heat or steam at high temperatures that destroy IHW	Environmentally advantageous; appearance unaltered, is possible to incinerated following; does not reduce volume, high capital costs (Ali et al., 2016; Azmal et al., 2014)
Microwave irradiation	Microwaves used to heat IHW	Metal cannot be present; appearance unaltered; volume not reduced (Ali et al., 2016; Azmal et al., 2014)
Incineration	Burning waste at very high temp	Environmentally unfriendly (air pollution and other toxic gasses; low cost; ash sent to landfills (Azmal et al., 2014)
Pyrolysis, thermal treatment in rotary kiln	Heating organic material at high temperatures which reduces them into gaseous components, small quantities of liquid, or solid residue without oxygen	ROI 4 years; residual components must also be properly removed and disposed of (Bujak, 2015).
Landfill	Burring solid waste materials under layers of earth	Adds to pollution of the environment; reaching maximum capacity in larger Urban areas (Askarany & Franklin-Smith, 2014)
Composting	Organic material such as yard waste and food scraps in specialized container	Not appropriate for toxic waste; practical and economic; reduces waste sent to landfill; can be reused for fertilizer replacing chemical use (Askarany & Franklin-Smith, 2014); by-products (methane gas) can be repurposed but is also an explosion hazard.
Recycling	Reusing, repurposing, or converting used materials into new materials	Environmentally friendly; reduces costs; creates additional revenue streams

study Baati et al., (2014) reported that statistical analysis revealed that one central steam sterilizer for all hospitals provided the best possible scenario.

In another study, Dursun, Karsak, and Karadayi (2011) used fuzzy multi-criteria group decision-making approaches in their analysis for identifying the most suitable HCW treatment alternative in Istanbul, Turkey. Dursun et al. also based their hierarchical structure for making their decision on four general criteria: economic, environmental, technical, and social determinates. Of the four methods under consideration for the disposal and treatment of IHW, that the best alternatives in ranked order were: steam sterilization, microwave, landfill, and incineration (Dursun, Karsak, & Karadayi, 2011).

Azmal et al. (2014) expanded on the argument against incineration because it resulted in increased greenhouse gas emissions (GHG) both during the incineration process and the subsequent transportation of the remaining material and high transportation costs. Caniato et al. (2015) reported that few examples of best practices for IHW are available in the literature and are particularly difficult to apply to low and middle-income countries (LMIC) due to the high implementation costs, the need for regulation and compliance, strong international support, economic resources, and the need for certain segregation practices at the facilities. Windfeld and Brooks (2015) informed how various legislation and treatment and disposal practices in the U.S., Canada, U.K., European Union (EU) and developing nations differed due to economic, regulatory, and segregation and treatment practices.

HCWM practices differ around the globe due to various factors including socioeconomic status, education, regulation, availability of resources, treatment technology, and monitoring and management practices (Caniato et al., 2015). Not only do these practices differ, but the terminology used to describe waste generated from HCOs also is inconsistent among countries around the globe (Caniato et al., 2015; Windfeld & Brooks, 2015). In the U.S., regulators use the terms *hospital waste*, *medical waste*, and *regulated medical waste* to indicate only the hazardous components generated by HCO, while WHO defines health-care waste more generally to include non-infections waste products coming from all healthcare related entities (Caniato et al., 2015). Other terms used by authors in the literature depending on the location, country, or area of study include *biomedical waste* and *clinical waste* (United Kingdom). Caniato et al., (2015) argued that these variations in terminology and the subjectivity with which individuals may define them have created a great deal of confusion. Therefore, Caniato et al. advocated for the creation of a set of international guiding principles and manuals which all countries can use to develop local standards that are consistent around the globe.

Integral to the issue of the most effective and efficient method of HCW treatment and disposal reported by scholars in the literature was the importance of waste segregation (Baati et al, 2014; Caniato et al., 2015; Carnero, 2015; Doiphode, Hinduja, & Ahuja, 2016; A. Kumar et al., 2015) with the majority of scholars emphasizing point-of-use waste segregation (Huffling & Schenk, 2014, Johnson et al, 2013; A. Kumar, et al., 2015; Mosquera, Andrés-Prado, Rodríguez-Caravaca, Latasa, & Mosquera, 2014;

Nichols & Manzi, 2014; Njue, Cheboi, & Oiye, 2015; Sengodan, 2014; Shivalli & Sanklapur, 2014; Toktobaev, Emmanuel, Djumalieva, Kravtsov, and Schüth, 2015). As a strategy, scholars studied waste segregation practices, and the strategies hospitals could employ to improve such practices in detail. There were several general themes found in the literature that discussed contemporary waste management strategies around the globe. The goals of waste management implementation varied with scholars emphasizing several themes: (a) minimizing the spread of disease (b) reducing the environmental impact of pollutants, (c) adhering to regulatory requirements, (d) creating a competitive advantage, (e) reducing operational cost.

Minimizing the Spread of Disease

Most of the scholars studying waste management practices in healthcare focused on the dangers HCW posed to healthcare workers, the environment, and the people in the surrounding communities where, if improperly disposed of, could cause the spread of harmful diseases and other adverse health consequences. Many scholars reported that improper disposal of HCW by hospitals was incongruent with the primary objective of promoting health and curing diseases (Agar, 2015; Hemchandra et al., 2014; Thakur & Ramesh, 2015). Adopting environmentally sustainable waste management practices (ESWMP) promote and protect population health (Agar, 2015; Hemchandra et al., 2014; Thakur & Ramesh, 2015) prevent the spread of disease (Ali et al., 2016; Anozie et al., 2017; Carnero, 2015) and occupational exposure to healthcare workers (Huffling & Schenk, 2014; A. Kumar et al., 2015; Thakur & Ramesh, 2015). Kumar et al. (2015) reported that waste handlers were the most susceptible among healthcare workers to

become infected by infectious waste due to poor management practices and improper precautions taken by waste handlers during waste collection, segregation, and disposal.

One of the primary objectives researchers discussed in the literature regarding the issue of the segregation of waste, was the ability to reduce the harmful effects of handling, transporting, and sorting infectious waste by waste handlers (Baati et al., 2014; A. Kumar et al., 2015; R. Kumar, Shaikh, Somrongthong, & Chapman, 2015; Njue et al., 2015). Kumar et al., (2015) reported that exposure to infectious diseases including cholera, hepatitis, tuberculosis, and skin infections are occupational hazards waste handlers and other healthcare workers face on a daily basis. Researchers, particularly in developing countries, found that segregating waste at the source minimized expose of health hazards to waste handlers and thus, the spread of infectious diseases.

Minimizing the Environmental Impact

Nearly every scholar discussing the topic of waste management practices, regardless of the industry, mentioned the primary objectives as environmental stewardship and environmental sustainability. The most frequently reported issue scholars reported in the literature were the effects of climate change and global warming (Agar, 2015; Carnero, 2015; Coffey et al., 2013; Huffling & Schenk, 2014; Thakur & Ramesh, 2015; García Vicente, Morales Suárez-Varela, Martí Monrós, & Llopis González, 2015). Agar (2015) reported that the EPA's energy conservation message implores individuals and firms to manage resources more efficiently by reducing, reusing, and recycling. Environmental challenges related to pollution and climate change have required healthcare entities to take a closer look at their carbon footprint, which they

have been slow to do (Agar, 2015). Healthcare processes add to the contamination of soil and surface and underground water supplies and increase the generation of allergic reactions caused by such contaminations (García-Vicente et al., 2015). Njue, Cheboi, and Oiye (2015) reported the environmental impact of pollution as a contributor to low birth weight babies born to mothers living near landfill sites. Thakur and Ramesh (2015) posited that sustainable healthcare would involve and promote healthier living and lifestyles. Healthcare leaders that adopt HCWM strategies provide win-win solutions to their organizations and their communities.

Adhering to Regulatory Requirements

Governmental regulations in all countries create incentives for healthcare entities to engage in environmental sustainability efforts. Ali et al. (2016b) reported that economic incentives including concerns for reputation and avoidance of regulatory fines were a significant incentive for sound waste management practices among hospitals in Pakistan. Also reported by researchers in the literature were avoiding or minimizing fines (Roberts, 2105), decreased liabilities (Ali et al., 2016; Diamond, 2014), and meeting accrediting bodies standards of care and safety requirements (Agar, 2015; Carnero, 2015; Diamond, 2014). Positive incentives for environmentally sustainable practices in all industries also included tax benefits, credits, and rebates (Ali et al., 2016b; Coffey et al., 2013; García Vicente et al., 2015; Wormer, 2013). Therefore, the implementation of HCWM strategies offers cost avoidance opportunities for HCOs.

In addition to the tax incentives, many scholars reported additional financial benefits environmental sustainability programs provided for their entities. Conway

(2014) reported that SMEs were able to reduce their carbon footprint while reducing costs associated with freight transportation. This latter benefit also qualified as both an environmental sustainability benefit as well as a financial benefit. Several scholars reported that HCOs created additional revenue streams (Ali et al., 2016b; Askarany & Franklin-Smith, 2014; Panepinto, Blengini, & Genon, 2015; WHO, 2014; Toktobaev et al., 2015; Vogt & Nunes, 2014; Yasar, Celik, & Sharit, 2016). Hemchandra et al. (2014) found that by selling the hospital's solid waste and containing patient costs through sterilization and reuse of certain consumables, the hospital saved over $2.9 million during a six-year period.

Creating a Competitive Advantage

The outcomes of CSR and competitive advantages have been the focus of numerous research studies as have the motivations for firms to engage in activities that bolster their corporate images. Complementary to environmental stewardship, scholars often discussed building sustainability by designing actions that drive the triple-bottom-line that results in environmental stewardship, economic prosperity, and social responsibility (Block, 2016; Carnero, 2015;). Coffey et al. (2013) found that what motivated participants to engage in sustainability practices was a sense of loyalty and support for their communities. Scholars and business leaders alike reported that engaging in CSR activities is a means whereby firms could create a competitive advantage. Arend (2014) reported that "orientation to, commitments to, and dynamic flexibility in the firm's CSR and green policies are significant factors in a firm's CSR and green-based competitive advantages" (p. 541). By balancing economic, environmental, and social

performance to differentiate their firm from their competitor's, companies create a competitive advantage.

Hospitals that adopted proper ESWMP derived both tangible and intangible rewards internally and outwardly into the community. Shetty & Gujarathi (2013) and Toktobaev, Emmanuel, Djumalieva, Kravtsov, and Schüth (2015) found that implementing ESWMP not only created a safer working environment for their employees; those employees reported a higher rate of job satisfaction. Shivalli and Sanklapur (2014) expanded on this concept by stating that ESWMP produced positive employee perceptions of the organization. Consistent with TEC, employee perceptions, safe working environments, and community perception are considerations healthcare leaders must account for when considering the adoption of HCWM strategies.

Scholars contributed a great deal to the body of knowledge in the literature on the topic of environmental sustainability issues in different types of manufacturing organizations. Scholars attributed CSR a primary concern for larger organizations and have considered it less crucial for SMEs (Carnero, 2015; Conway, 2014; Nagypál, 2014). Despite the extensive literature on CSR in other business sectors, until recently the healthcare industry has only recently developed an interest in CSR aside from the daily provision of healthcare services (Agar, 2015; Russo, 2016). Carnero (2015) argued that because HCOs produce every class of waste, of which up to 20 % is hazardous, researchers must perform more studies on effective waste management practices. Carnero posited that HCOs should set the standards for corporate social responsibility (CSR) by encouraging economic, social, and environmental sustainability through a

balance between care and economic need. By balancing care and financial need, HCOs could develop preventative measures that minimize their environmental impact thus bolstering their CSR and competitive advantage (Carnero, 2015).

López-Toro, Rubio-Romero, Suárez-Cebador, and Arjona-Jiménez (2016) argued that if HCOs dealt with waste properly, the social, economic, and environmental impact of the protection of natural resources through the efficient use of raw materials and energy would positively affect the perceptions of stakeholders. Employees play an essential role in SMEs' CSR both in the selection of the kind of activities, the implementation of actions and customers are also important motivating factors of SME's CSR responsibilities (Nagypál, 2014). Russo (2016) regarded CSR as the responsibility of all individuals in HCOs whose shared purpose was to promote the common good by carrying out their missions in the best way possible through ethical practices. A shared ethic of a common good is a strong moral foundation that emphasizes cooperation among stakeholders to go beyond the maximization of resources in the pursuit the best health care (Russo, 2016). In this regard, all participants carry out the specific duties of their profession in the best way possible (Russo, 2016).

Beyond the ability to generate a competitive advantage, many scholars considered environmental sustainability practices as a moral, ethical, and legal requirement for all business entities. García Vicente, Morales Suárez-Varela, Martí Monrós, and Llopis González (2015) posited that particularly in an industry whose professionals seek to protect, care for, cure and prevent illness, environmental sustainability in health care is an ethical issue. Sengodan (2014) concluded that protecting humans from the adverse

effects of HCW is both the legal and social responsibility of a healthcare organization. Thakur and Ramesh (2015) argued that a sustainable health system must invest and engage in preventative care and emphasize health rather than focus on disease by promoting healthy living and lifestyles, workplace health, rapid innovation, and novel low-carbon technologies within their communities. Environmental sustainability practices can create a competitive advantage by increasing customer loyalty, generating premium pricing and lead to other cost benefits through innovation and environmental leadership (Clarkson, Fang, Li, & Richardson., 2013). Researchers have reported that there is a positive association between CSR by firms in a variety of industries, voluntary environmental responsible practices, and company value in both cash flow and stakeholder perceived value (Plumlee, Brown, Hays, & Marshall, 2015).

Ameer and Othman (2012), Clarkson, et al. (2013), Feng and Wang (2016) and Wagner (2015) found that management of corporations with superior sustainability practices would also have higher performance metrics. For example, Wagner (2015) found that there was a positive association between the integration of environmental and economic performance dimensions including increased sales, market share, and new market opportunities. Ameer and Othman informed that businesses with global sustainability practices had higher financial performance metrics (return on asset, i.e. ROA, profit before taxation, and cash flow from operations). Clarkson et al. reported that firms that improved their environmental performance experienced actual economic benefits in the form of profitability (ROA) and cash flows relative to firms that opted not to change their environmental performance. Ameer and Othman confirmed their

hypothesis that corporations with superior stainability practices would have higher financial performance metrics than those that did not and reported their findings indicated that businesses that emphasized eco-centric issues compared to ethnocentric issues performed better financially. Moreover, Feng and Wang contributed to the body of knowledge by reporting that EMS bolstered a firm's financial performance by improved customer satisfaction that resulted in enhanced customer loyalty.

Block (2016), Russo (2016), and Van Dyke (2016) argued that healthcare leaders focused cost savings and cost-cutting efforts too heavily on tightening budget that they have overlooked how improved efficiencies can improve the true value of healthcare. Van Dyke (2016) posited that reducing costs from clinical areas rather than cost savings generated by reducing overhead or creating additional revenue streams meant improving efficiency and effectiveness of the care delivery. The financial co-benefits of developing environmentally sustainable programs in healthcare were healthcare worker's more efficient use of resources which lead to a deeper understanding of their clinical systems and its interdependencies while undergoing a redesign process (Hovlid et al., 2012; Russo, 2016). In addition, Russo (2016) argued that HCOs that perform their work well meet their patients' needs, improved performance, and increased operational efficiencies.

Reducing Operational Expenses

Several researchers argued that proper segregation of general waste and infectious waste would lead to reduced operational expenses. Researchers reported that the costs associated with the treatment and disposal of infectious waste are between five to ten times the cost of noninfectious waste (Huffling & Schenk, 2014; Vogt & Nunes, 2014).

Johnson et al. (2013) reported that missegregation of healthcare waste (HCW) increased costs for hospitals who are already experiencing budgetary constraints and are increasingly scrutinized by governmental agencies and the public for the increased amounts of environmental pollutants they generate. Mosquera, Andrés-Prado, Rodríguez-Caravaca, Latasa, and Mosquera (2014) stated that by improving the classification method of segregation by staff members, workers shifted previously improperly disposed of waste to the appropriate waste stream (infectious to general) which reduced disposal costs. The exclusion of noninfectious waste from infectious waste streams increased recyclable waste and resulted in a 26% savings (Mosquera et al., 2014).

Many scholars noted that hospitals benefited from waste segregation strategies through cost reductions and the creation of additional revenue streams. Several authors reported that the hospitals they studied were able to reduce costs associated with sterilizing miss-segregated waste (Doiphode et al., 2016; Huffling & Scheck, 2014; Johnson et al., 2013; Mosquera et al., 2014; Sengodan, 2014; Toktobaev et al., 2015), recycling (Carnero, 2015; Huffling & Schenk, 2014; Sengodan, 2014), and in some cases reused sterilized product packaging (Agar, 2015; Caniato et al., 2015; Hemchandra et al., 2014). Doiphode, Hinduja, and Ahuja (2016) reported that nonhazardous healthcare waste was recycled and sold to recycling companies generating additional revenue. Huffling and Scheck (2014), and Johnson et al. (2013) reported substantial savings to biohazard waste sterilization costs through the proper segregation of general waste from previously missegregated waste into infectious waste containers. Recycling (Agar, 2015;

McGain & Naylor, 2014; Toktobaev et al., 2015), reuse, and selling of both general waste and sterilized IHW and single-use devices (Agar, 2015; Hemchandra et al., 2014; Huffling & Schenk, 2014) were the methods that scholars found as the most useful strategies to reduce operational costs or provide additional revenue streams as well as generate CSR.

Challenges to the Implementation of Waste Management Strategies

Human welfare organizations, scientists, and environmentalists have lobbied for cleaner air and water, fewer pollutants, reductions in energy and water consumption, healthier living conditions for people and environmental protections for animal habitats around the globe. Most developed countries and many countries considered as underdeveloped (or developing) or resource-constrained, have environmental protection and population health laws that address the protection of human and animal conditions against improper handling of toxic substances and the dumping of all forms of waste in unauthorized areas. In underdeveloped countries, however, socioeconomic conditions make adhering to governmental regulations difficult if not implausible (Ali et al., 2016b; Ali, Wang, Chaudhry, & Geng, 2017; Baati et al., 2014; Caniato et al., 2015).

The bulk of the scientific literature on waste management strategies emanated from the developing nations Asia, Africa, and the Middle East (Caniato et al., 2015). Primary barriers to adhering to regulatory standards for IHW found in the literature included managing the transportation and disposal to treatment facilities common in LMIC (Ali et al., 2017; Baati et al., 2014; Njue et al., 2015). Many developing countries were unable for economic reasons to treat IHW on site, increasing the risk of exposure to

hazardous infectious waste to their workers and the surrounding community. Improper transportation from the the cite of waste generation to the storage and handling areas within the hospital as well as the improper use of personal protective equipment (PPE) were also reported as challenges (Assis, Gomes, Balista, & Freitas, 2017; Caniato et al., 2015; A. Kumar et al., 2015; R. Kumar et al., 2015). A. Kumar et al. (2015) reported that the most significant issue to proper biomedical waste handling at their hospital was due to waste handlers lack of compliance with wearing appropriate PPE because they were not aware of the importance of doing so as well as climate conditions which made wearing such equipment difficult. R. Kumar, Shaikh, Somrongthong, and Chapman (2015) reported that inadequate worker safety existed and occurred due to the lack of availability of PPE for workers, insufficient budgeting by leadership for equipment used in infectious waste management (color-coded bins, PPE, transportation containers, lack of storage space), lack of adequate training and communication relating to the hazards of infectious waste and its proper handling, and weak supervision and monitoring of HCW (Anozie et al, 2017).

Researchers reported that they often found that organizational barriers reduced the ability for healthcare workers to engage in environmentally sustainable practices or follow regulatory requirements (Dunphy, 2014; Jabbour et at., 2016; Joshi et al., 2015; Pinzone et al., 2015; Sari & Camponogara, 2014). Scholars frequently described the scarcity of resources, underfunding, and absence of strategic capabilities or support by hospital leadership as barriers to the implementation of HCWM strategies. Ali, Wang, Chaudhry, & Geng (2017), and A. Kumar et al. (2015) found that waste handlers lacked

the proper PPE because their institutions could not afford to purchase them. Nichols and Manzi (2014) discovered that lack of segregation bins resulted in the inappropriate disposal of waste and noncompliance with local or national waste management policies. R. Kumar et al. (2015) reported the lack of discrete waste bins to separate infectious from non-infectious waste resulted in inadequate worker safety. R. Kumar et al., Nichols and Manzi, and Sari and Camponogara (2014) expanded on this issue by stating that a lack of physical space for segregation bins was also a barrier to cost containment efforts in developed countries as well. Ali et al. (2016) also reported that hospital leadership also cited financial concerns and the perception that implementation of sound HCWM practices would overburden staff as barriers. Jabbour et al. (2016) determined that internal barriers that support environmental stewardship were more challenging to overcome than external barriers.

Primary to waste segregation, scholars reported strategies to achieving appropriate segregation was knowledge (Caniato et al., 2015; Hovlid et al., 2012; Johnson et al., 2013; Nichols & Manzi, 2014; Njue et al., 2015; Manzi, Nichols, & Richardson, 2014; Shivalli & Sanklapur, 2014) education or training of healthcare workers (Johnson et al., 2013; Joshi et al., 2015; Mosquera et al, 2014; Manzi et al., 2014; Sengodan, 2014; Shivalli, & Sanklapur, 2014) in particular waste handlers (Baati et al., 2014; Kumar, A. et al., 2015; Kumar, R. et al., 2015; Njue et al., 2015), and employee motivation (Dunphy, 2014; Joshi et al., 2015; Pinzone et al., 2015) by primarily the nursing staff who perform the majority of the care and the generation of waste in their processes (Ali et al., 2016; Huffling & Scheck, 2014; Shivalli & Sanklapur, 2014). Because most of the researchers

focused on the direct actions of the clinical staff and the point of use segregation of waste, researchers pointed to the importance of this group and their ability to advocate for making changes (Huffling & Scheck, 2014; Mosquera et al., 2014; Shivalli & Sanklapur, 2014).

Scholars frequently investigated worker motivation as a potential barrier to engaging in sustainability practices. A worker's level of awareness of environmental issues and their perception that their actions will have little direct impact on such issues affected their motivation to engage in sound HWM practices (Coffey et al., 2013). Sari and Camponogara (2014) reported that management's motivation to environmental education (EE) profoundly influenced worker motivation to engage in environmentally sustainable practices. The conditions for change within the organization validated the value of sustainability among workers (Sari & Camponogara, 2014). Moreover, Coffey et al. (2013) reported that worker's awareness of leadership's commitment to green practices played a role in the attitudes and actions toward adopting green practices. Gkorezis (2015) furthered the concept of supervisory support in worker motivations towards pro-environmental behavior in his study and suggested that the theory of leader-member exchange (LMX) played a mediating role in facilitating such adoption.

Ali et al., (2016) found that concern over the facility's positive reputation and apprehension of liability as the primary motivational factor affecting worker adoption of sound HCWM practices. Arend, 2014, Coffey et al., 2013, Gkorezis, 2015, and Lloret, 2016, reported that managerial enthusiasm and commitment to the adoption of green practices played a significant role in worker's adherence to positive HCWM practices.

Gkorezis (2015) reported that employees who received supervisor support towards their engagement with pro-environmental behavior mitigated these motivational barriers. R. Kumar et al. (2015) concluded that continuous supervision and monitoring of staff was necessary to ensure compliance with proper waste management practices.

Transition

The purpose of this study was to explore strategies some Midwestern U.S. hospital leaders and managers used to minimize waste management operational costs. Section 1 provided the foundation for this study by introducing the problem, purpose, conceptual framework, research questions, and the significance of the study. Section 1 also included an extensive literature review that offers details as to the reasons efficient waste management strategies are beneficial to hospitals, the waste management strategies HCOs and other industries have used, and the challenges hospitals have faced implementing waste management strategies.

The primary objective of Section 2 is to provide the reader with a detailed description and justification of the method, design, population and sampling, and data collection and analysis techniques I used in this study. I also detailed how I organized and maintained the data, and the techniques I used to ensure the reliability and validity of the data.

In Section 3, I present the findings and discuss their application for professional practice to minimize waste management operational costs in hospitals. Section 3 also addressed the implications for social change and recommendations for further research in waste management practices that reduce operational expenses in hospitals.

Section 2: The Project

The purpose of this qualitative case study was to explore what strategies can help healthcare leaders and their organizations minimize operational costs associated with waste management activities at their facilities. In this section, I describe my role as the researcher and provide a detailed description of the research method and design, the participants and the sampling process, the importance of ethical research, and the techniques I used for data collection, organization, and analysis. I also address the strategies I used to enhance this study's reliability and validity as it applies to the qualitative research method.

Purpose Statement

The purpose of this qualitative single case study was to explore strategies some hospital managers of medium-sized hospitals in Midwestern U.S. use to minimize waste management operational costs. The participants in this study were hospital leaders, managers, and an employee who have successfully adopted strategies to minimize waste management operational costs at their facility. The findings of this study could assist hospital leaders to minimize hazardous waste treatment costs, energy consumption, carbon dioxide (CO_2) gas emissions, decrease waste sent to landfills, and generate additional revenue streams. The implication for positive social change may include reduced service costs and improvements to the health and well-being of the people in the area hospitals serve.

Role of the Researcher

The role of the researcher in qualitative case studies is significantly different from that of a researcher in quantitative methodological studies. In qualitative research, the researcher aims to gain an in-depth understanding of an event through a variety of data sources using words for analysis rather than seeking to measure something using numbers (McCusker & Gunaydin, 2015). In case study research, the researcher uses their lens to gain insight into the phenomenon (Baxter & Jack, 2008). The researcher uses their eyes and perspective to explore the experiences of the participants under investigation so that they may develop a deeper understanding of them (Cronin, 2014). Therefore, in qualitative studies, the researcher becomes the measurement instrument whereas in quantitative, the measurement instrument takes the form of a survey, questionnaire, or experiment (Yin, 2014). In this study, my role as the researcher was to review the extant literature, develop semistructured interview questions, select and interview the participants, secure and review relevant documents, analyze and interpret the data, and report the findings.

I engaged participants from a single hospital system in the Midwest. Due to time constraints and stated workload issues, I conducted interviews via the telephone or Skype. Prior to conducting the interviews, I described to each participant the purpose of the study, explained the interview process, reminded them that participation in the study was voluntary and that they could discontinue the interview at any time without repercussions. In addition, I requested permission from the participants to tape the interview and explained that I would use it to create a transcript. I also explained that in

addition to taping the interview, I would also take notes. Finally, I ensured that each participant signed the approved Internal Review Board (IRB) Letter of Consent before beginning the interview.

My background consists of 37 years in the healthcare field in various ancillary departments, many of which were as the head of departments related to neurodiagnostics. While the number of years spent in the healthcare field are many, my expertise lies outside of the waste management arena. My interest in the topic is a culmination of the practical need for hospitals to find innovative methods for reducing operational costs and the current importance of climate change and reducing healthcare's carbon footprint, which is a significant contributor to global pollution, climate change, and the spread of disease.

There are inherent concerns the researcher, using qualitative methods, must mitigate to the best of their ability. As the measurement instrument, a qualitative researcher will interpret data sources based on their worldviews which are shaped by their previous events and experiences (Yin, 2014). The researcher uses their philosophical worldview as the foundation on which they build their research methodology. A researcher's worldview will determine the strategies of inquiry, how they will study the problem, and the intended audience (Christ, 2013). These events and experiences may create biases that the researcher must recognize, address, and moderate using a variety of techniques during data collection.

Mitigating the inherent weaknesses of a qualitative case study methodology required that the researcher address their personal worldviews during data collection. To

this end, the researcher can enhance data credibility using multiple data sources also known as data triangulation (Baxter & Jack, 2008; Cronin, 2014; Yin, 2014). The aim of data triangulation is to use multiple sources to corroborate the same findings (Yin, 2014).

In addition to data triangulation, a researcher must mitigate personal biases through techniques that verify how the researcher has understood the perspectives of the participant's without interjecting their personal biases. In this study, I used semi-structured interviews to gain an understanding of the lived experiences of the participants. I used two methods of verifying that I did not interpose any personal bias into the final analysis: (a) member checking and (b) transcript reviews. Member checking is the process by which the researcher discusses with participants their interpretations of the data collected during the interview process and the participants could verify and clarify those interpretations (Baxter & Jack, 2008). Therefore, member checking is the best process to confirm the credibility of the interview data (Boblin, Ireland, Kirkpatrick, & Robertson, 2013).

The researcher must follow the ethical principles established by the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (NCPHSBBR) in the Belmont Report of 1979. The Belmont Report detailed three general principals regarding the protection of human participants during research investigations: (a) respect for persons (b) beneficence, and (c) justice (Miracle, 2016; Yip, Han, & Sng, 2016). The Belmont Report is the standard guide that researchers must follow which clarifies the differences between research and practice (Miracle, 2016). I

participated in the required certification for the protection of human subjects as required by Walden University's IRB and the NCPHSBBR (certificate number 1910017).

Participants

The unit of analysis for this study were leaders and managers of a medium-sized hospital system in the Midwestern U.S. that implemented strategies to minimize waste management operational costs. I conducted interviews with the chief executive officer (CEO) emeritus, the past senior vice president of business services, the sustainability director and one of his employees. I recruited the participating hospital from the member hospitals of the Healthier Hospital Initiative, a Practice Greenhealth organization that is a resource for environmental solutions in the healthcare industry. I chose the organization based on their commitment to the Healthier Hospitals' less waste challenge that had successfully minimized waste management operational costs. Potential participants demonstrated their willingness to participate by returning an informed consent form to me by email.

I used purposive sampling to recruit participants for this study. Purposeful sampling is a method often used by researchers in qualitative studies when participants must meet specific criteria for eligibility and to gain an understanding of specific research agendas (Duan, Bhaumik, Palinkas, & Hoagwood, 2015; Lee-Jen Wu, Hui-Man, & Hao-Hsien, 2014). Lee-Jen Wu, Hui-Man, and Hao-Hsien (2014) reported that purposive sampling is particularly useful because the chosen informants are uniquely qualified to provide rich information of value to the study. In order to explore the strategies hospital leaders used to minimize waste management operational costs, participants needed to

have significant knowledge of the strategies and the processes that were necessary to successfully implement those strategies. I included other hospital workers as participants that played different roles within the implemented processes. Therefore, I also used a technique known as snowball sampling to asks recruited participants to identify other key individuals who might provide further information-rich evidence on the hospital's waste management strategies. Random sampling was not appropriate for this study because participants would not have met the inclusion criteria.

I determined the appropriate sample size when I reached data saturation. In qualitative research, investigators reach data saturation when additional inquiry yields no new or supplementary evidence regarding further information, insights, themes, or perspectives (Tran, Porcher, Falissard, & Ravaud, 2016). Nichols and Manzi (2014) reported that researchers who used purposeful sampling methods achieved data saturation faster because their inquiry was more precise and their participants were more informed.

Research Method and Design

The qualitative research method enables researchers to gain a rich, in-depth holistic understanding of human experiences through the rigorous study of an event, action, or phenomena (Park & Park, 2016; Polit & Beck, 2010; Yin, 2014). In this study, I explored the strategies hospital managers used to minimize waste management operational costs at a medium-sized hospital system the Midwest. I chose the case study method because it is the most appropriate design for an in-depth analysis of which strategies reduced waste management operational costs at the selected hospital.

Research Method

The researcher's selection of the research method is wholly dependent on the research purpose and what the researcher aims to measure (Baxter & Jack, 2008; Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014; McCusker & Gunaydin 2015). There are three methods of inquiry in contemporary research: (a) quantitative, (b) qualitative, and (c) mixed methods. For this investigation, I determined the qualitative method of inquiry was suitable because of the nature of the research question (its purpose) and the flexibility and rigor the qualitative method provided (Baxter & Jack, 2008; Cronin, 2014; Yin, 2014). Polit and Beck (2010) reported that some qualitative researchers believed that using a qualitative research method reveals higher level concepts and theories that are applicable in other situations. Boblin, Ireland, Kirkpatrick, and Robertson (2013), Dasgupta (2015), and Yin (2014) reported qualitative studies are naturalistic because they occur at the site of study and do not manipulate the participants or the environment in which they take place. Polit and Beck informed that the goal of qualitative research is to influence the views of decision makers whose policy decisions affect the health and well-being of others; therefore, qualitative research has a more practical perspective. I, therefore, determined that a qualitative method of inquiry was best suited because the purpose of this study was to reveal the reasoning behind the hospital leader's choice of business strategies to reduce operational costs associated with waste management practices.

The strength of qualitative case studies is the richness of the data the researcher collected through multiple units of analysis. The qualitative method of inquiry is

inductive and flexible where the researcher gains an understanding of the phenomena through the interpretation of the collected data (Boblin et al., 2013) without imposing bias or pre-existing expectations (Dasgupta, 2015). Dasgupta (2015) reported that inductive analysis commences with direct observations where researcher extrapolated general patterns. The ability to gather multiple data sources and the flexibility of inquiry were additional reasons for choosing the qualitative method for this study.

Quantitative research involves the measurement of phenomena on a statistical level. Researchers use one of three types of designs to numerically measure data: (a) experimental, (b) quasi-experimental, and (c) observational (Yin, 2014). Quantitative methods require a preconceived hypothesis and seek to find statistical relationships between independent and dependent variables. The goal of quantitative research is to determine causality (Boblin et al., 2013; Park & Park, 2016; Yin, 2014). Traditionally, many in the scientific community view quantitative methods as factual and scientific, while perceiving qualitative research as softer and more subjective (Barnham, 2015).

Barnham (2015) argued quantitative inquiry leaves a void because it fails to capture insight into the deeper understanding of what participants think. Some qualitative scholars go so far as to question the true generalizability of quantitative research and the ability to generate a representative sample by randomly selecting participants from the population (Polit & Beck, 2010). These skeptical researchers argued that randomization and the generalizability model is an ideal goal, rather than a real-world representation and (Polit & Beck, 2010). Criticisms aside, the quantitative

inquiry did not fit the intended purpose of this study, and therefore, I chose the qualitative method of inquiry.

The third technique of inquiry, mixed method, combines a qualitative component with a quantitative analysis. Almutairi, Gardner, and McCarthy (2014) reported that researchers use the mixed-methods technique in one of two ways: as complementary to one another or sequentially to triangulate data collection and analysis strategies. Christ (2013) argued that the mixed method research methodology offers the best of both methods and is a pragmatic approach to research more scholars should consider. However, I disqualified the mixed-methods approach due to the empirical component and the lack of alignment with the purpose of my study.

Research Design

The case study design increased in popularity among researchers in business, education, sociology, and the health sciences because of the ability for researchers to gain an in-depth understanding of a specific phenomenon (Almutairi, Gardner, & McCarthy, 2014; Tran et al., 2016; Yin, 2014). Boblin et al. (2013) reported that two scholars, Stake and Yin, have led the research community in supporting the qualitative methodology and the case study design. However, Boblin et al. stated that these scholars have differing methodological orientations. While Yin's orientation is postpositivist, Stake is reportedly a constructivist (Boblin et al., 2013). Boblin et al. informed that a constructivist orientation minimizes the role that the conceptual framework plays in the interpretation of the data suggesting that it should guide the study, but that it is not necessary. Boblin et al., Nelson and Evens (2014), and Dasgupta (2015) argued constructivist researchers

believe truth is relative and through discovery, researchers can reveal embedded content. Postpositive researchers seek truth in more formal and structured manners (Boblin et al., 2013; Dasgupta, 2015). Researchers with this worldview value processes and stress the importance of research methods including the use of a formal conceptual framework (Boblin et al., 2013). In this study, I evaluated the strategies hospital leaders used through the OLT and TCE theories, and therefore, utilized a postpositivist orientation.

By using a case study research design, researchers can gain multiple perspectives from their participants in order to generate rich contextual information about the subject under investigation (Cronin, 2014). Dasgupta (2015) informed that case study research is particularly useful in the following situations: (a) when the phenomenon under investigation is broad and complex, (b) when there is insufficient body of knowledge to establish cause and effect, (c) when a holistic, in-depth investigation is needed, and (d) when researchers cannot study the phenomenon outside of the setting in which it occurred (p. 151). A case study design was appropriate for this study because I sought to gather rich, in-depth data on the strategies hospital managers used to minimize their waste management operational costs.

There are other qualitative methodological designs that I took into consideration when determining which study design was most appropriate for my study. These two study designs were the phenomenological study and ethnography. Researchers who use the phenomenology design aim to gain a better understanding of human experiences and the beliefs, experiences, and views of their participants as they relate to those experiences (Duckham & Schreiber, 2016; Nazir, 2016). The ethnographer studies how people

interact with one another and their cultural characteristics (Ketokivi & Choi, 2014; Leslie, Paradis, Gropper, Reeves, & Kitto, 2014; Park & Park, 2016). Because this study involved strategic decision making of diverse groups of people in a healthcare setting, neither the ethnographical design or the phenomenological designs were suitable.

Woodside (2010) reported that quantitative scholars had criticized qualitative research because the inductive method relies on the researcher's personal, cultural, and experiential values. In addition, the scientific community has levied strong criticisms against case study research because of the lack of generalization, abstractions, and formalization (Ketokivi & Choi, 2014). As Woodside argued, scholars who were proponents of quantitative research methods viewed thick descriptions in case study research as chaotic in complexity that "detract from the necessity to generalize beyond the immediate case" (p. 65). Classical empirical researchers view the variability of the inductive method of case study research as an inherent weakness that fails to test associations and generalize to theory (Woodside, 2010).

Another criticism quantitative researchers have levied against the qualitative method of inquiry is related to sample size. An adequate sample size is one of the criteria of validity which is dependent upon a sound sampling strategy and achieving data saturation (Elo et al., 2014; Lee-Jen Wu et al., 2014; Tran et al., 2016). Most scholars agree that in qualitative research data saturation indicates that the researcher has an adequate sample size (Chowdhury, 2015; Elo et al., 2014; Lee-Jen Wu et al., 2014). To enhance data saturation, and thus, the validity and credibility of this study, I continued

the interview process until I obtained data saturation; meaning when there was a redundancy in the information participants share.

Population and Sampling

I used the purposive sampling technique to collect suitable participants for interviews. Purposive sampling is a non-randomized method of selecting participants who have specific knowledge, experiences, or involvement that is critical to understanding a phenomenon (Elo et al., 2014; Gheondea-Eladi, 2014; Hovlid et al., 2012). Using purposive sampling, researchers are able to recruit participants that are uniquely capable of providing rich information that delivers value to the study (Lee-Jen Wu et al., 2014), which enhances transferability and analytic generalizability (Polit & Beck, 2010). I included high-level managers and waste handlers who have expertise in waste management and who were involved in the decision and implementation phases of such strategies at the facility.

In addition to purposive sampling, I used snowball sampling as a secondary method to reach data saturation. Snowball sampling is another technique researchers use in qualitative studies to recruit participants based on their ability to reflect on participation in the topic under investigation (Elo et al., 2014). The snowball sampling method is a chain-driven method whereby researchers recruit additional participants through recommendations of previously interviewed participants (Griffith, Morris, & Thakar, 2016). Elo et al. (2014) stated that one of the criteria for establishing validity is thoroughness of data collection to the point of data saturation or redundancy in the information the researcher receives from the interviewees. Dasgupta (2015) argued that

researchers should continue participant interviews past the point of saturation to enhance the credibility of the findings. In addition, Elo et al. (2014) reported that researchers might have problems with data analysis, such as difficulty linking themes without achieving data saturation (Elo et al., 2014). Therefore, in order to ensure data saturation, I used a combination of purposive and snowball sampling as methods of finding participants.

Ethical Research

The three guiding principles of ethical research with human subjects are beneficence, justice, and respect for others (Yip et al., 2016). Paramount to these guiding principles are informed consent, anonymity, confidentiality, special precautions for vulnerable populations, participant equality, and avoiding deception (Kara & Pickering, 2017; Yin, 2014; Yip et al., 2016). Researchers must conduct their inquiry in a moral and ethical manner by following the ethical principles set forth by Walden University Internal Review Board (IRB). I received approval from the Walden University IRB (approval number 10-02-17-0532742) before conducting any research activities.

Given that the goal of the study was to obtain insights into waste management strategies that assisted hospital leaders to minimized operational expenses, my research did not involve subjects in vulnerable populations. I provided participants with an informed consent form (See Appendix A) prior to their enrollment and informed them that their participation in this study was voluntary. The written consent form included procedures for withdrawing from the study, clarified that there were no incentives given

for their participation, and assure them that their participation in this study would remain confidential.

At the beginning the interviews, I reminded the participants of the interview process, requested verbal confirmation that they received and signed the Letter of Consent form, and requested permission to tape the interview. I reiterated that I would transcribe each interview verbatim, and provide them with the opportunity to review a summary of my interpretations of the data resulting from their individual interviews (member checking). In addition, I informed participants that I would use a coding process that replaces their name and that of the institution, and that I will keep all materials pertaining to the study in a secured location for five years to ensure the protection of their rights.

Data Collection Instruments

For this qualitative single case study, I served as the primary data collection instrument and utilized multiple sources for data collection. I performed face to face semistructured interviews via Skype or by telephone, which I recorded on my computer using a software program specifically designed for recording Skype audio and video calls. In cases where the participants did not have access to Skype, I conducted telephone interviews that were audio recorded. Researchers use participant interviews to provide them with rich, in-depth information concerning the perceptions and perspectives of the participants and allow for spontaneity and flexibility (Almutairi et al., 2014; Carter et al., 2014). Almutairi et al., (2014) informed that interviews in qualitative research provide a

better opportunity for researchers to gain more in-depth information than survey methods allow.

In qualitative research, scholars use multiple data sources to gain a comprehensive understanding of the phenomena under evaluation (Carter et al., 2014) and to enhance data dependability and credibility (Baxter & Jack, 2008; Yin, 2014). In addition to in-depth interviews, other data sources frequently used by qualitative scholars include document reviews, archived records (public, organizational, and survey data), various observational methods, and physical artifacts (Almutairi et al., 2014; Carter et al., 2014; Yin, 2014). Data triangulation is the term researchers use to describe the use of multiple sources of data and is the criteria by which the trustworthiness of qualitative studies is measured (Cronin, 2014; Elo et al., 2014). Therefore, in addition to semistructured participant interviews, I reviewed relevant documents, financial reports, and observed the facility's website for relevant information pertaining to the organization's environmental waste management (EWM) practices.

To address reliability, validity, and credibility of the interview data, in addition to recording participant interviews, I transcribed each interview verbatim. I used member checking to provide interviewees with the opportunity to review a summary of their interview to ensure the themes I captured represented their experiences, views, and the information they wished to convey. Member checking is one of the verification techniques researchers use in qualitative studies to enhance validity and credibility (Coffey et al., 2013; Houghton, Casey, Shaw, & Murphy, 2013). Harvey (2015)

informed that member checking allows participants to reflect on their experiences and provide additional comments and data to the researcher.

I utilized a password protected computer to transcribe the interview data, as well as a tool to organize and analyze the data (NVivo). I backed-up the data to a separate data storage device that is also password protected. I used NVivo to keep journal notes during the interview and while coding as a means to reflect on the data analysis process. Reflexivity is one of the tools qualitative researchers use to enhance dependability and confirmability of the data (Houghton et al., 2013). I will maintain the journal and all other collected data (copies of reports and other information related to the study) on the data storage device in a locked drawer in my home office for a minimum of 5 years.

Data Collection Technique

I collected data by conducting semi-structured interviews with healthcare leaders at a hospital in Midwest that successfully implemented waste management strategies which minimized operational costs. I used the interview protocol located in Appendix C. I combined the data collected from these interviews with other documents including preexisting financial documents, descriptive notes (journal entries and reflective notes), and observations of the facility's official website. Yin (2014) stated that “one of the most important sources of case study evidence is the interview” (p. 110). Not only does the researcher gather narrative data while conducting interviews, but they are also gathering data through observations such as the participant's body language, demeanor, and other meanings that are not express with words (Nazir, 2016; Park & Park, 2016).

To strengthen reliability and credibility and reduce bias, I also used data triangulation. In addition to interviews and observations, I gathered documents including two years of financial metrics associated with the waste management strategies of the hospital. These documents included year- end reports from one year before and five years after the leadership implemented their waste management strategies and revealed the operational savings generated by these strategies. In addition, member checking was used to ensure that I properly interpreted and summarized the participant's thoughts and experiences.

There are many strengths and a few weaknesses to the use of the data collection sources I have used. While interviews provide the researcher with the ability to ask targeted questions relating to the topic under investigation, there is the potential of introducing biases both from the researcher and the participant (Yin, 2014). Direct observations are time-consuming, and participants may not perform the same as they would when they are otherwise unobserved. Document reviews are excellent sources of information. However, Yin (2014) reported that gaining access to certain documents may be difficult and, in some cases, deliberately withheld.

Data Organization Technique

One of the fundamental issues of gathering multiple sources of data is effective organization and management of the information (Baxter & Jack, 2008; Yin, 2014). Yin (2014) and Baxter and Jack (2008) suggested the use of a computer database system to track and organize data sources to improve case study reliability. Improper organization of the data can lead to misinterpretation or the inability to establish convergence of

themes (Yin, 2014). Therefore, I used software that helps enhance data organization. I used NVivo to store and organize transcribed and coded data and organized participants material using a coding system to protect participant's identities. All documents were uploaded into NVivo and stored on the same storage device. Once uploaded into NVivo, I destroyed the original copies.

Data Analysis

Qualitative data analysis is a multifaceted and challenging endeavor. Unlike quantitative studies that have numerical data to analyze, researchers using qualitative methods must analyze words. Quantitative narrative analysis (QNA) is a methodology that some researchers use to make the analysis of narratives possible and more robust (Chowdhury, 2015). QNA utilizes computer software to quantify narrative data into codes and themes (Chowdhury, 2015). One such computer program is NVivo, which I chose to assist me with my data analysis. QNA software is also helpful with data organization, sifting, and reflexivity (Chowdhury, 2015; Saldaña, 2016; Woods, Paulus, Atkins, Macklin, 2015)

Using a specialized software tool such as NVivo has several advantages. QNA software enables the researcher to organize and track their data (Baxter & Jack, 2008; Yin, 2014). Another advantage is that software programs can save time and help a novice researcher more readily interpret the data. I began to analyze the data during collection, which is suggested as a best practice (Elo et al., 2014; Yin, 2014). Elo et al. (2014), posited that researchers are better able to recognize when they have reached data

saturation if they collect and analyze the data at the same time. QNA analysis assists by minimizing all the above issues.

Reliability and Validity

Researchers look for certain elements when judging the quality and rigor of a research study. Gheondea-Eladi (2014) stated that validity and reliability are the most critical standards that ensure a study's quality. Yin (2014) reported that scholars apply four tests to case studies which influence the perceptions of readers and other researchers as to whether a study is credible, trustworthy, or, in other words, valid. In general, validity refers to whether an indicator is a sound measure of the concept under investigation (Baxter & Jack, 2008; Elo et al., 2014; Gheondea-Eladi, 2014). While these terms are used in both quantitative and qualitative studies to assess the credibility of a study, qualitative researchers often refer to the trustworthiness of qualitative inquiry (Elo et al., 2014).

Reliability

Reliability in case study research refers to the ability of a researcher to repeat the previous researcher's study with consistent findings and conclusions (Yin, 2014). A study is said to be reliable when later researchers repeat the same protocols as in the original work and arrive at the same conclusions. The researcher can bolster a study's reliability through sound methodological protocols and documentation procedures (Cronin, 2014; Dasgupta, 2015; Yin, 2014).

Validity

Validity in case study has four components: (a) construct validity, (b) internal validity, (c) external validity, and (d) reliability (Yin, 2014). Construct validity refers to the ability of the researcher to interpret the data objectively and not allow their subjective judgments or preconceived ideas to skew their interpretation of the data (Yin, 2014). Internal validity applies to studies that seek to explain a causal relationship and is the most difficult test for case study research quality (Yin, 2014). Gheondea-Eladi (2014) further stated that internal validity provides a link between theory, observation, and coding. Researchers can strengthen their case study's internal validity by identifying and rejecting rival hypotheses and demonstrating the absence of false relationships (Yin, 2014). External validity is the extent to which a study's finding, or inferences (Polit & Beck, 2010), are generalizable to other settings (Avellar et al., 2017; Gheondea-Eladi, 2014; Yin, 2014).

Credibility, Dependability, Confirmability, and Transferability

Because the terms reliability and validity are terms associated with more traditional experimental or quantitative research methods, qualitative researchers use the terms credibility, dependability, transferability, and confirmability to evaluate the quality of qualitative research (Elo et al., 2014; Gheondea-Eladi, 2014). Reliability in quantitative research is analogous to dependability in qualitative research (Houghton et al., 2013) while confirmability, credibility, and transferability are terms used to express validity in qualitative studies (Yin, 2014).

Researchers must employ a variety of strategies throughout the study to enhance their study's rigor and thus dependability, confirmability, credibility, and transferability. Dependability refers to the stability of data over time and the ability for other researchers to conduct the same study under similar conditions (Houghton et al., 2013; Elo et al., 2014; Yin, 2014). Researchers enhance case study reliability by clearly describing the study's purpose and procedures used to select participants and by developing and maintaining a case study database (Elo et al., 2014; Yin, 2014).

Credibility in case study research refers to the trustworthiness of the data collection and analysis techniques and believability of the findings (Houghton et al., 2013). Credibility describes how well the research data addressed the research question as represented in the findings. (Elo et al., 2014). Confirmability refers to the ability to confirm or substantiate the findings and includes eliminating bias and subjectivity during all phases of the study (Elo et al., 2014; Houghton et al., 2013). Like dependability, transferability represents the ability of other researchers to replicate a study and arrive at the same or similar findings (Elo et al., 2014; Gheondea-Eladi, 2014). It is ultimately the reader that makes the determination of the transformability of a study's findings to similar situations and context (Elo et al., 2014; Houghton et al., 2013). Researchers can enhance transferability of their studies by clearly describing data collection and analysis methods, participants, and other conditions in which the study was conducted (Elo et al., 2014).

There are several strategies researchers can employ to enhance the reliability and validity of a study. One of the strategies is data saturation. Saturation in research refers

to the level at which researchers have gathered enough data during the interview process to determine they had a large enough sample (Elo et al., 2014; Gheondea-Eladi, 2014; Lee-Jen Wu et al., 2014). Polit and Beck (2010) argued that saturation maximizes the likelihood that a study's findings are generalizable and that other scholars can replicate it. Saturation determines when the researcher has achieved an adequate sample size because, with data saturation, data replication also occurs further verifying that the study is comprehensive and complete (Elo et al., 2014). Data saturation is important for content validity in qualitative studies (Cronin, 2014). Per Tran, Porcher, Falissard, and Ravaud (2016), although there are no current studies published in the literature that explicitly defined what sample size is necessary to achieve data saturation, they believed that researchers achieved data saturation when three to 10 consecutive participants did not produce new information or generate any new themes.

Triangulation is another method that researchers use to enhance their study's reliability and validity. Data triangulation is the term researchers use to describe the use of multiple sources of data and is the criteria by which the trustworthiness of qualitative studies is measured (Cronin, 2014; Elo et al., 2014). In qualitative research, researchers use multiple data sources to gain a comprehensive understanding of the phenomena under evaluation (Carter et al., 2014) and to enhance data dependability and credibility (Baxter & Jack, 2008; Yin, 2014). In addition to in-depth interviews, other data sources frequently used by qualitative scholars include document reviews, archived records (public, organizational, and survey data), various observational methods, and physical artifacts (Almutairi et al., 2014; Carter et al., 2014; Yin, 2014).

There are four types of triangulation: (a) method triangulation, (b) investor triangulation, (c) theory triangulation, and (d) data source triangulation (Carter et al., 2014). Method triangulation entails a researcher using multiple methods of data collection techniques to measure the same phenomenon (Carter et al., 2014; Polit & Beck, 2012). A researcher who engages multiple investigators to observe and collect data for the same study is using investor triangulation. In theory triangulation, the researcher examines the data through multiple theoretical lenses (Carter et al., 2014). Finally, a researcher uses data source triangulation when collecting data from different individuals, groups, or communities (Carter et al., 2014). In this study, I will use both method triangulation and theory triangulation to analyze the data.

Transition and Summary

I provided a detailed explanation of the study in Section 2 and explained the research methodology and design, population, role of the researcher, and the participants. In addition, I discussed the ethical considerations with human subjects that researchers must abide by, described the data collection and analysis techniques, and addressed reliability and validity issues and how I would enhance them for this study.

In section 3 I provided an analyze and interpretation of the data and discuss the findings and the ways that these findings extend the knowledge of the theoretical framework and the strategies healthcare leaders used to minimize operational costs associated with waste management activities at their facilities. In addition, I discuss the results and their applicability to professional business practice as well as the implications for positive social change. Finally, I provide recommendations for further research.

Section 3: Application to Professional Practice and Implications for Change

Introduction

In this section, I elucidate my findings and discuss their application to professional practice aimed at minimizing waste management operational costs in hospitals. I also describe the implications for social change, recommendations for action on this topic, and discuss areas for further research as to how healthcare leaders can reduce operational expenses using environmentally responsible waste management strategies. Finally, I concluded this section with my reflections on the DBA doctoral study process and any personal biases that might have influenced the participants during data collection.

The purpose of this study was to explore the strategies that hospital leaders used to minimize their facility's operational costs. I collected the data through semistructured interviews using the research questions of this study, financial documents, and the participants' hospital website. The interviewees included leaders, managers, and employees directly responsible for the direction or implementation of these strategies. I used NVivo to assist in the coding, organization, and triangulation of the data. The theories of OLT and TCE provided the theoretical lenses through which I analyzed and interpreted the data. Based on the thematic analysis, the following four primary themes emerged: (a) engaged leadership, (b) incorporate sustainability into the mission, vision, and values of the organization (c) create an organizational culture of sustainability and (d) innovation. A subtheme of creating an organizational culture of sustainability was

teamwork. In Table 4, I report the number of sources and times each of these themes emerged.

Presentation of the Findings

The research question was as follows: What strategies do hospital leaders use to minimize waste management operational costs? I collected data from a single hospital system located in the Midwestern U.S. I utilized purposive and snowball sampling methods to reveal and interview individuals who had intimate knowledge of the organization's waste management minimization strategies. Four individuals met the criteria required for participation. In addition to interviews, I obtained other data from the health system's official website and financial documents which I then used for data triangulation. I provided the participants with a summary of their transcribed interviews for the purpose of member checking which they returned.

Table 4

Frequency of Primary Themes from all Sources

Code Categories	*N*	Sources
Innovation	21	12
Incorporate into mission, vision, values	17	6
Leadership	16	5
Corporate culture of sustainability	12	4
Teamwork	9	7

Theme 1: Engaged Leadership

The theme of engaged leadership first became evident during my attempt to recruit a participant organization for this study. I sent letters to all the hospital leaders and sustainability coordinators that were members of the Healthier Hospital's Initiative (a Practice Greenhealth organization in the healthcare industry) that reported they successfully minimized their waste management operational costs. I followed the letters with phone calls and emails. In some cases, the individuals were no longer at the facility, and thus, their replacements were not qualified under my study requirements. In other instances, leadership had not filled their position. At one hospital, the sustainability coordinator was still in their position; however, the senior leadership had changed and was not as supportive of sustainability initiatives because of their perceived costs and uncertain return on investment (ROI). This concern is consistent with the theory of TCE as some leaders do not perceive that sustainability can produce the financial benefits from the capital expenditures and contractual obligations some HCWM strategies might require (Ketokivi & Mahoney, 2016).

To explain some of the barriers other CEOs have reported to the implementation of ES waste management processes, P1 stated that many CEOs have not "caught up with the understanding that's part of a healthcare organization's responsibility, to keep the community healthy." In addition, P1 reported that CEOs and CFOs look at their budgets and the capital costs associated with implementing ES waste management processes and cannot envision the ROI. These remarks are congruent with researchers who reported that healthcare managers ignore the long-term intangible benefits of ES (Lampikoski,

Westerlund, Rajala, & Moller, 2014). P1 stated he responds to other CEOs perceived barriers by explaining that they do not need to go to the extent his organization has, but by managing waste (both common waste and pharmaceuticals) and energy, they could make money, inspire their staff, and gain competitive advantage in the community through their CSR activities. P1 summed other leaders' barriers as first being philosophical and then financial. So, for ABC Hospital, waste management processes are a win-win for the organization and the community.

All four interviewees agreed that implementation of HCWM strategies required strong, committed, leadership to drive sustainability initiatives. P2 stated "that it takes engaged leadership" on the part of senior leadership and the Board. P2 felt strongly that all the organization's leaders needed to communicate to the staff that ES strategies are a priority for the organization so that "it becomes a core activity not just this thing we do because it seems to be important." A strong leader communicates the value of ES strategies to the organization's stakeholders.

P3 agreed that passionate leadership was essential for an organization to successfully implement ES strategies. He reported that as CEO, P1 was the one who identified the need to manage their waste in an environmentally responsible manner. As stated by P3, because P1 was the CEO and a pediatric physician, he saw how pollution negatively impacted their community and his patients specifically. Therefore, P1 was passionate about setting sustainability goals and talked to people in the ES industry could help him learn how to reach ES goals in healthcare (P3). P3 reported that it was P1 as a passionate leader setting the goals and challenging the staff to manage the hospital's

waste, increase recycling, getting rid of Styrofoam, and reducing waste and consumption that got them started and lead to their successes.

In the case of ABC Hospital, the impetus for beginning to address waste management issues was the result of leadership that felt that keeping the community healthy meant addressing the enormous amounts of energy, waste, and pollution their organization contributed to the environmental degradation of their communities. As described by P1, "So first it is just to say, our job is more than just saying *wait till you break your arm and then come in*. Our job is to keep the community healthy." He began with that concept that their job is to keep the community healthy, he convinced the Board, communicated the vision to the staff, and provided the resources to let his staff begin to act. P1 believes that by doing the above, bright people in the organization will find innovative ways of doing so.

Epstein and Buhovac (2014) contended that for sustainability strategies to work, leadership must have committed to it and built the capacity to support it within the organization. Azmal et al. (2014) argued that leadership commitment was an essential component of sustainability initiatives in hospitals. In this study, the participants supported the above author's statements with their comments. P2 remarked that "I think in his role as CEO he was passionate about those issues for a very long time. We were supported and inspired and encouraged by our senior leadership not to have anything go into the landfill." P4 reported that the CEO supports and encourages them to "go out and seek some of the answers" and it is this permission that allowed them to look for answers to their waste management issues.

Specific strategies that minimized ABC Hospital's waste management operational costs included a recycling program which senior leadership has set a goal of recycling 80% of their applicable waste, expanding their use of reusable's, a hazardous medical waste management program, and a food waste reduction program. The ABC Hospital system has implemented many additional programs that are unrelated to waste management but have accounted for millions of dollars in savings. While discussing these strategies, P1 explained that they hired a sustainability coordinator with the challenge of making three times his salary on the recycling program because he did not want the coordinator's salary to come at an additional expense and increase the cost of care. P1's goals were to make the recycling program "economically sound and engage the breadth of the staff."

> The strategy was to say, we are going to do this, and it is going to lower the cost of care and improve the environment because we don't have all the waste just going into the landfill. And so, we set out to do a couple of things; we started saying, this is a good thing for our organization, we will make money if we just separate these things rather than throwing them all in the same trash can. That turned out to be quite successful. (P1)

Not only did P1 feel a commitment to ES, but he also was acutely aware that to be successful, a sustainability program had to pay for itself and not increase costs that would eventually become a financial burden to their patients.

Theme 2: Incorporate sustainability into the mission, vision, and values of the healthcare organization

A key component to the implementation of sustainability strategies is the ability for leadership to incorporate sustainability into the organization's mission, vision, and values (Block, 2016; Epstein & Buhovac, 2014; Wijethilake, 2017). Sustainability operations should be integrated into the value system of an organization for stakeholders to understand the relationship between the daily operations of patient care and environmental stewardship (Block, 2016). The ability for organizations to integrate ES into their core values allowed for them to address sustainability issues strategically instead of only for a specific purpose or on a short-term basis (Wijethilake, 2017). Azmal et al. (2014) concluded that even though the primary mission of healthcare organizations is to promote health, they further argued that fulfilling that overarching mission includes that the organization does "no harm to the patient, self and society, and the environment" (p. 2639). Without such integration, leadership has not clearly communicated to employees and physicians that sustainability is a core value of the organization.

The participants all voiced the opinion, which was also supported by statements on the official website, that there is a link between the mission of ABC Hospital and their commitment to the health of the community and waste management as an integral part of that commitment. P2 stated that developing strategies "was simply about leadership, building a vision that was big enough that people that had to go on the journey from here to there thought the journey was worth it." P1, as the leader of the organization,

conveyed that the most important impetus for engaging is waste management and sustainability strategies had to do with "living the mission of the organization, to take a broad view of the mission of health care and say for once, we'll start looking at health and not just healthcare." Taking a broader view of health to P1 meant asking if their hospital system was impacting the community by making them better or worse, and how could they do a better job living their mission to keep their community healthy?

Several of the participants reported speaking at healthcare ES conferences where attendees, often CEOs, discussed some of their perceived barriers. P1 reported that several CEOs commented that waste management and ES were out of the scope of healthcare. "They'll say *our job is to take care of sick people and you're off building windmills and doing weird stuff*. They think it's some throwback to the 60's or 70's" (P1). The CEOs P1 spoke of did not perceive that getting involved in their overall community's health was part of their organization's mission. Instead, P1 argued that most CEOs have a narrowly focused perception aimed only at taking care of sick people rather than the broader concept of population health.

P2 also felt strongly that a hospital should incorporate community health, and therefore ES, into its overarching mission. Formerly on the healthcare system's board, he was also passionate and vocal about community health being an essential part of their mission. P2 recalled that one of the initial arguments was how ES relate to fixing sick people. However, he responded that "if your mission is to improve outwardly the communities you serve, then being environmentally responsible is probably a pretty important part of that mission." Therefore, while P2 was on the board he thoroughly

understood the link between environmental responsibility and community health and supported P1's ES goals. A few years later, P2 became directly responsible for the system's waste management strategies when he joined the senior leadership of the organization.

There were several areas in the healthcare system's official website that reported that addressing ES issues were consistent with the mission and values of the organization. Not only has the health system tackled HCWM, but it is also addressing the entire spectrum of ES issues. For example, a page on the website reported "[a clinic at ABC Hospital] is a shining example of the healthcare leader's commitment to improving the health of the environment and communities it serves by increasingly powering its buildings with clean, renewable energy." Another page discussed the biomass boiler that the system recently installed stating that the "project is part of [ABC Hospital's] plan to lead the healthcare industry in environmental stewardship and lower energy cost." By integrating ES strategies into ABC Hospital's core values, leadership created opportunities for them to minimize operational expenses.

The strategy of incorporating and communicating ES practices into the organization's mission and vision statements is consistent with OLT and TCE. Feng et al. (2014) reported organizations that adopted efficient EMS embodied a high degree "of commitment to learning, shared vision, open-mindedness, and knowledge sharing" (p. 2910). These same four dimensions of learning orientation, combined with EMS, enhanced firm performance (Feng et al., 2014) while minimizing inefficiencies is a core element of TCE.

Theme 3: Create an organizational culture of sustainability

Researchers have defined organizational culture in many ways. In this study, I referred to an organization's culture as a variety of characteristics that include employee's shared values, beliefs, behaviors, and assumptions as part of their orientation to the organization (Shier & Handy, 2016) which may have physical, tangible, and behavioral manifestations (Yan, 2016). Organizational cultures range on a continuum from weak to strong (Yan, 2016) and open to restrictive (Baumgartner, 2014). Corporate culture develops through a learning process as successful actions and procedures become commonly accepted behaviors (Baumgartner, 2014). Consistent with the concept of the OLT as proposed by Fiol and Lyles (1985), organizational culture develops through the employee's reflection of their past actions from which they learn and improve.

For leaders to create an organizational culture of sustainability, they must first "align their mission and vision statements with embedded sustainability values" (Porter, Gallagher, & Lawong, 2016, p. 207). Because of the importance leadership plays in the development of the organization's mission, vision, and values, strong leadership is essential to the development and maintenance of a sustainable culture within the organization. P2 explained that it was his responsibility “to continually lead the Board and to show them that this is a part of our mission and it was those guys that just rolled up their sleeves and did the work.” Passionate leadership that championed ES waste management strategies created an organizational culture within this healthcare system that further facilitated the processes.

Another respondent described their commitment to the organization's culture of sustainability and the value of having the sustainability director involved in every process that had a waste management component. At ABC Hospital, the sustainability director attends system wide operational meetings, pharmacy (for discussions of hazardous waste disposal issues) and purchasing. Describing the organization as being "very waste conscious," P3 stated the reason they were so successful was that the sustainability department has their "hands in every cookie jar. There's not one area of this organization that we don't deal with. So, we have meetings at every operational level." By being involved at every level of the organization, the staff of the sustainability department ensures the organization maintains a culture of sustainability.

When discussing the organizational commitment to sustainability, several respondents explained how they worked with the state's Department of Natural Resources (DNR) and the Environmental Protection Agency (EPA) over the years. P4 described the day that they first came to audit the facility and how their organization reacted. P4 remembered the day well because he had only been in his position for 7 months when the DNR and EPA came to ABC Hospital to do a site survey for pharmaceutical and hazardous waste. Stating that it was on that day, they realized they had much room for improvement, but instead of making excuses, they owned their problems and requested assistance in fixing them, which P4 said they did immediately. After making corrections, ABC Hospital chose to commit to performing at the level of best practices rather than meeting minimum regulatory compliance. "And at the direction of P1, we got our marching orders to create a best practice pharmaceutical and hazardous waste program.

(P4). Taking responsibility for their ES actions, setting the bar at the best practice level, and becoming a leader in healthcare hazardous waste disposal sets ABC Hospital apart from most of its competitors as well as other HCOs around the country.

The above statement by P4 represents the commitment ABC Hospital had to solving issues that arose and overcome them. Rather than creating a program that met minimal standards, the organizational culture is one that expects to raise the bar to be a best practice leader in their pharmaceutical and hazardous waste program. P4 explained how the organization's culture affected the way employees dealt with their waste management issues, consistent with OLT conceptual framework. P1 also said

> we will do a best practices program. We might not get there immediately but that was their [senior leadership's] goal, and this is everybody's goal, not just a select few who had to give their blood, sweat, and tears to get this stuff out…we not only had corporate communications, but we had corporate learning. Our own internal education team helped us develop training and education materials that are mandatory for a few of the departments like nursing. And so, we had the people who helped educate our staff, and we had the entire nurse educator's department behind us. Because, not that nursing was difficult at all, but they are the most impacted by this.

Instilling a sustainability culture within ABC Hospital's system challenged employees to find innovative solutions their waste management processes.

Once the organization met their quality and performance goals doing some exceptionally innovative changes in procedures, P3 invited one of the inspectors to the

facility to verify that what they were doing complied with all of the State's laws and regulations. P3 gave the inspector full access to their facility including showing them their records and processes. The inspector was so impressed with ABC Hospital's processes and outcomes that he returned to his boss with the idea that ABC Hospital could provide a seminar for the DNR's hazardous waste inspectors to learn how they can better inspect healthcare facilities.

The workshop ABC Hospital provided the DNR was a three-day event which P3 described as both a lecture format that included tours around the facility. Speakers included; pharmacists that discussed "what hazardous medications really are to healthcare, and the difference between hazardous medications and hazardous waste, what high-risk medications really mean;" their legal team discussion Joint Commission and OSHA (Occupational Safety and Health Administration) and how they affect what healthcare organizations; nursing personnel explain how inspectors should explain or ask questions so they (nurses) can better understand them; and finally, a facility's manager explained hospital generator requirements. As P3 elucidated,

> because the crazy thing about healthcare is we are every industry in one, I mean we have manufacturing, we'll have plastic injectionals, so they'll be dealing with that, we have a ton of universal waste, a ton of electronic waste, all these generators, condensers, and refrigerators, we have oil and Freon, tons of batteries; and that's not even getting into the weird stuff we see as being first receivers.

This workshop established ABC Hospital's hazardous waste program as the premier HCWM program within the state.

Interview questions four and five concerned organizational challenges to the implementation of waste management processes and how they were able to overcome them. P3 remarked that communication and cultural barriers were their most significant challenges. However, because his mom was a nurse who had worked for the organization for 49 years, she let him know that if he made her job harder, she would "disown" him. He said he always had her and other clinical staff in mind when contemplating process changes. Before implementing changes, P3 stated he would think through the processes, involve nursing in the design and implementation, pilot test, and communicate the changes clearly. Numerous researchers have documented the importance of corporate culture in the successful implementation of sustainable practices including appropriate values, ethics, and attitudes that are found in a learning environment (Porter et al., 2016). It is clear from the results of this study; ABC Hospital maintains an organizational culture of sustainability.

Teamwork. A sub-theme to creating an organizational culture of sustainability is the fostering of a team culture. In healthcare, and particularly in hospitals, employees must work in cooperation with one another often across the boundaries of their primary departments. Körner, Wirtz, Bengel, and Göritz (2015) reported that an organization's culture influences the degree of interprofessional teamwork within the organization. Interprofessional teamwork has five fundamental elements: communication, respect, cooperation, and work climate (Körner, Wirtz, Bengel, & Göritz, 2015). Healthcare organizations that cultivate higher degrees of teamwork among healthcare professionals have greater staff satisfaction, higher patient satisfaction, treatment acceptance, improved

treatment quality, improved safety, and better clinical outcomes (Körner et al., 2015). The importance of teamwork in healthcare is therefore essential to HCOs and HCWM.

Teamwork has been critical for ABC Hospital in their hazardous waste program. During our discussions on how their roles at the hospital helped to facilitate decreased waste management operational costs, most of the respondents spoke of how, along with other team members at the hospital, they worked together to create processes that made things easier for other team members. As P3 stated reported that in every waste stream he has made changes to, those changes were designed to make things easier for the patient care staff. P3 added that they despise making things more complicated "because, in healthcare, that's every regulation that really just makes things more complicated. And we have a pretty strong line that when it's an inefficiency to staff or a patient, we don't want to implement it." The commitment to efficient caregiver processes, in turn, creates a more harmonious work environment and better patient care.

I pointed out to P3 that my findings from the literature review overwhelmingly recommended having clinical staff sort waste at the source. P3 explained that what works for other healthcare facilities does not work for them. Training clinical staff was difficult but training environmental department staff was much more so. "I mean how are they going to tell the difference between cerebral spinal fluid, saliva, or phlegm? They can't. So, if it's wet and it came out of the human body, we're just going to call it infectious" (P3). P4 agreed stating that they changed out smaller waste containers for big red step on containers to make it easier for the staff to dispose of all waste quickly. The philosophy

at ABC Hospital is to make things easier on their clinical staff "so they can spend more of their time taking care of patients and less time dealing with their waste streams" (P4).

For P4 questions four and five came quickly to him when he stated "Well, I think it's that we work as a team, and we really do…and so as a team, we work together." The sustainability staff listen to the issues presented by staff members in another department, work through the issues with them, attend formal and informal gatherings and staff meetings. They made themselves available to all shifts and did not pretend to know or tell them how to run their particular areas or units better than they did.

At ABC Hospital, P3 described a situation where teamwork was particularly crucial in determining why he found a particular medication bottle in a hazardous waste bin of a unit that would not have that drug on hand to administer. On an average unit, patients are picked up by transporters for various diagnostic or therapeutic procedures throughout the day and sometimes at night. Nurses must administer medications at specific intervals for pain management or treatments. Many medications are considered hazardous, and staff must dispose of them in proper containers, or the entity may get a citation and fine.

P3 sorts all the pharmaceutical waste in the sustainability department and therefore knows what department it comes from. P3 first weighs each bin, and all its contents are tracked back to each department. One day, P3 explained he found several vials of a drug known as methotrexate in the cardiopulmonary department's bin. Methotrexate is an immunosuppressive and chemotherapy drug not stored (or used) in a typical cardio-pulmonary department and is considered a hazardous chemical for

disposition purposes. To find out why someone disposed of these vials in the cardio-pulmonary department and why several single-use vials were being used instead of a multi-use vial, P3 met with the pharmacist. Working together with the pharmacy department he helped them resolve a potential patient care and hazardous waste disposal issue.

Tung et al. (2014) reported that teamwork was directly associated with enhanced operational environmental performance and thus concluded that organizations interested in enhancing such performance should support a team culture. Shi, Wu, and Tseng (2017) also noted that teamwork was an essential operational criterion for the establishment of ES. In another study conducted by Pandey and Dardi (2017) 94% of the interns in their study responded that teamwork is essential to biomedical waste management in every class of worker in the hospital. Other examples of teamwork were found and associated with the fourth theme: innovation.

Theme 4: Innovation

As previously discussed in Section 1 of this study, organizations need to develop a learning culture that fosters improvisation and experimentation to improve inefficiencies and minimize the use of unnecessary resources (OLT theory). Researchers have identified organizational learning as a contributing factor to a corporate organizational culture that fosters innovative programs and initiatives (Çınar & Eren, 2015). Organizational learning refers to the extent to which an organization supports the ongoing learning and development of its staff (Shier & Handy, 2016). Therefore, innovation requires learning by doing, one of the primary concepts of OLT.

TCE has at its core the concern for efficiencies by avoiding the waste of both efforts and resources. Wagner (2015) indicated that divestment of problematic business activities related to regulatory requirements or focusing on pollution prevention created more value for the company and reduced transaction costs. However, upfront purchase costs have prohibited many organizations from establishing sustainability practices. Therefore, creating innovative processes of managing waste in healthcare organizations requires both organizational learning and transaction costs economics.

ABC Hospital has created unique processes by which they have eliminated inefficiencies, exceeded regulatory requirements, and saved hundreds of thousands of dollars. After P3 joined ABC Hospital, he assessed the methods the hospital had initiated to manage their hazardous pharmaceutical waste and found that the nursing staff was sorting bottles on the floors which the pharmacy technicians had color-coded by marking each bottle with colored dots that represented the type of drug and what bin it should be disposed in. The containers were also color coded so that the clinical staff would know which bin to put it into. The purpose of doing so was to sort them so when the containers were picked up by hazardous waste personnel for treatment and disposal they could be placed in barrels and sent to the proper hazardous waste treatment and disposal facility to meet regulatory requirements.

Pharmaceuticals comprise the majority of the hazardous waste consumed and disposed of in hospitals (P3). The predominance of researchers concluded that staff should sort all waste at the source in order to minimize costs associated with hazardous waste disposal and treatment. However, the participants reported that at ABC Hospital

they have worked out a better system so that nurses can spend more time with patients and less time with non-clinical functions. P3 stated that when he started working at ABC Hospital, he observed nurses disposing of used pharmaceutical bottles in color-coded bins in a secure area on the units. Upon inspection of these containers, P3 noticed that most of the bottles were only missing a small percentage of the drug but the majority of the contents remained. Per National and State regulations, that meant that the entire bottle needed to be disposed of in a hazardous waste container and sent out for treatment and disposal. In total, the organization was shipping 17 barrels of hazardous pharmaceutical waste to incinerators every three weeks.

P3 found that not only were the pharmacy technicians spending 17 hours per week color coding the bottles for the nurses to dispose of the drugs in the appropriate container; a third-party service would come in, take the bins and dump them into large barrels. The results were that every three weeks, ABC Hospital was sending 17 barrels of pharmaceutical waste off campus to the incinerators. After observing this for three weeks, P3 discontinued using a third-party service to package their barrels, and I started packing them himself. After further consideration, he questioned why the patient care staff were sorting these on the floors? To find out, he went to the pharmacy manager and suggested that rather than having the pharmacy technicians spend 17 hours a week putting dots on pharmaceutical bottles, all the bottles should go into one bin which would go to the sustainability department where P3 would weigh and sort each bin into the proper barrel for treatment and disposal. After changing this process, ABC Hospital reduced their hazardous waste shipments from every three weeks to once per quarter.

The method used by P3 at ABC Hospital is consistent with TCE where the costs associated with working with a third-party vendor for their hazardous waste collection and disposal were far more expensive than the hospital personnel performing these tasks in a more efficient and cost-effective manner. P3 reported that the time commitment to manage the previous process was more significant because only specific staff are legally allowed to can handle pharmaceutical waste which also requires a security officer who has to be present from the time the drugs were dumped into the drums until the truck left the loading dock (a three to four-hour time requirement). So rather than spend three to four hours every three weeks supervising the shipments as his predecessor did, P3 is spending less time and there is no need for a security officer, and they do not tie up their loading dock or a driver for nearly half a day. P3 stated that their goal is to have the driver at the loading dock for less than 20 minutes. "So, we got the shipments down and that alone, just using two hours of my week, dropped our pharmaceutical waste disposal form $110,000 to about $35,000" (P3). Not only were the number of barrels reduced, so was the extra time to the sustainability coordinator and the security guard as well as the blockage of the loading dock.

To increase their recycling rate and make recycling confidential paper more efficient, ABC Hospital changed out large paper bins to smaller containers that allowed housekeeping to empty them three times a week which saved "22 hours a week in labor and increased our recycling rate by about 1.4 tons a week just by collecting paper" (P3). P3 discussed how their recycling efforts have recently increased due to changing their paper recycling processes. Previously, and because of HIPAA (Health Insurance

Portability and Accountability Act), providers and staff in their clinical areas had personal shredders to shred patient's personal information. Disposing of paper became very problematic because there wasn't enough space for enormous recycling bins which also is not HIPAA compliant, and third-party shredding services were too expensive. Working with providers, they found a container that fit, was easy to empty, required a lot less staff, and was HIPAA compliant allowing their ED staff to go to every provider area, collect the paper, and dispose of it in a timely manner. This change in processes permitted them to recycle every piece of paper they had in their providers' offices.

The innovative method ABC Hospital found to shred and recycle their confidential paper was also incredibly resourceful. ABC Hospital partnered with a local vendor who purchased a paper compactor and a shredder and several recycling facilities in their state. The local vendor keeps the compactor in a secured location which ABC hospital build for it outside their facility. Housekeeping empties the small containers in the provider's offices and all around the campus into the compacter container that the local shredding vendor picks up monthly and takes to their shredder. The shredding company then transports the paper to one of the three recycling businesses that reprocess it into toilet paper or fiberboard. ABC Hospital and their shredding vendor then split the revenue. "We actually get money for our confidential paper, we don't have to pay for the compactor, we don't have to pay for the pickups, and we split the rebate with the vendor, it works out really well" (P3). Consistent with TCE, arrangements made by ABC Hospital's leaders with vendors reduced expenses, created an additional revenue stream and turned inefficient processes into more efficient ones.

One of the most profound inefficiencies that P3 found as he was sorting through the pharmaceutical waste bins was the amount of drug that remained in most of the bottles. Drug bottles are single-use items, meaning depending on the dosage prescribed, if the bottle contains more than the prescribed dose, the remainder must be thrown away in a hazardous waste bin. So, for example with nitroglycerin bottles, ABC Hospital originally purchased 500 ml bottles which P3 informed he would find half full when the bins were picked up from the nursing units. Because P3 was weighing each bin and keeping records of the volumes from each unit on a spreadsheet; after he collected five weeks of data he went to the pharmacy manager with the information and decided to purchase smaller 250 ml bottles. The result was that ABC Hospital purchased smaller bottles, did not waste the drugs they bought, and they saved "a ton of money" (P3) on hazardous waste disposal costs.

However, in some cases, even when they downgraded the bottle sizes, enough remained in the bottle requiring P3 to dispose of it and its contents in the hazardous waste barrels for incineration. P3 stated that he still did not want to throw them in the hazardous waste barrel because he wanted to lower the cost of disposing of it even more. Together with the facilities department, they came up with a system to pop the tops off the bottles, drain the liquid drug into a hazardous waste drum and sell the bottles another recycling company. “So, I don't pay $350 a barrel, I pay $99, and instead of 80 drums at $350, I'm now sending one drum at $350” (P3). The reduction in costs per barrel was the result of reducing the number of pharmaceutical hazardous waste barrels to medical waste which cost must less to treat and dispose of.

Each time the sustainability department looked at an issue, as a team they arrived at innovative ways to deal with the challenges they faced. However, first, they investigated the problem, measured and analyzed the waste, and tracked their progress. P1 stated, "We measured what percentage we recycled, moved it up, and we showed [the Board] we could pay for a sustainability coordinator here out of recycling alone." In the food waste reduction program, they measured by weight how much food they had left over, worked with tools from lean manufacturing and engaged staff in coming up with answers to resolving their excessive food waste issues. As P3 stated "I always like to manage the resource first…. First, you have to qualify what waste you have; then you can quantify it. So that's the same approach we took with food waste". Investigating and monitoring the food waste and engaging staff to resolve the problem resulted in more efficient operational activities and minimized waste management operational expenses.

Table 5 displays the cost savings and revenue generated from ABC Hospital's waste management strategies. The first column displays the revenue generated from their recycling program. In 2010, ABC Hospital generated a total of $1,250. Within a seven-year period, ABC Hospital increased their annual recycling revenue by 1926% for a total earned revenue of $125, 625. Most notable are the cost savings in hazardous waste that were 95% below the baseline year. Infectious waste and solid waste costs rose due to their philosophy of simplifying infectious waste disposal for clinical staff. Overall, they significantly reduced their cost per patient day from $3.45 to $1.90, a 55% reduction.

Table 5

ABC Hospital's Waste Management Cost (Revenue) by Waste Type

Fiscal Year End	Recycling (Revenue)	Hazardous Waste	Infectious Waste	Food Waste	Solid Waste	Spend Per Patient Day
2010	$1,250	$150,836	-	-	$57,953	$3.45
2011	$3,500	$110,887	$58,602	-	$59,525	$3.71
2012	$11,250	$78,577	$58,713	$3,560	$60,532	$2.98
2013	$13,500	$48,389	$81,202	$2,960	$63,250	$2.99
2014	$18,950	$25,894	$78,415	$1,520	$64,299	$2.26
2015	$27,520	$7,919	$97,914	$1,250	$62,999	$2.13
2016	$24,329	$8,721	$82,977	$712	$64,325	$1.90
2017	$25,325	$7,996	$85,901	$753	$63,295	$1.90
Total	$125,624[a]	($142,840)[b]	$27,300[c]	($2,807)[d]	$5,342[e]	-1.56
% Change	1,926%	-95%	47%	-79%	9%	-55%[f]

Note. [a]Total revenue generated from recycling; [b]annual reduction from 2010 in hazardous waste management costs; [c]annual cost increased from baseline; [d]decreased annual costs from baseline; [e] annual increase in costs from baseline; [f]percent reduction in cost per patient day from baseline.

Applications to Professional Practice

Many organizational leaders consider sustainability to be a social problem and not a business problem (Porter, Gallagher, & Lawong, 2016). As I reported in this study, among healthcare leaders, this conviction is even more salient as the prevailing thought is that the business of healthcare only begins when a patient comes through the facility's doors. However, the results of this study may provide healthcare leaders with a different perspective on the business of healthcare which is becoming more about community health, operational efficiency, and financial savings than just about patient visits. This study may fill the knowledge gap in which hospital leaders may develop and implement waste management strategies that minimize operational costs.

To develop financially successful waste management strategies, hospital leaders must themselves be engaged leaders, incorporate sustainability into the mission, vision, and values of the organization, create an organizational culture of sustainability, and foster innovation. These strategies require a framework of organizational learning and the ability to look beyond the initial capital expenditures some of the ES processes might incur by considering all transactional costs including more efficient processes and long-term cost savings. Bansal and DesJardine (2014) termed leaders who pursue short-term goals over long-term value creation (long-term earnings) "short-termism" (p. 73). CEOs and CFOs that think in this way often discount the future and look for immediate gratification which often leads to suboptimal organizational outcomes (Bansal & DesJardine, 2014; Lampikoski et al., 2014). Hospital leaders must understand that ES strategies can make them more efficient and less wasteful of financial and natural resources. Wasting resources are financially irresponsible; saving resources are economically and environmentally responsible.

Internal and external stakeholders also favor organizations that perform in a socially conscious manner. Marti, Rovira-Val, and Drescher (2015) asserted that firms' stakeholders are becoming increasingly concerned about the impact corporations have on the environment. Organizations can gain a competitive advantage by integrating "social and environmental initiatives into their core business strategies" (Marti, Rovira-Val, & Drescher, 2015, p. 316). In addition, firms that behave in a socially and environmentally responsible manner are also positively associated with superior employee recruitment and retention capabilities (Jones, Willness, & Heller, 2016; Robertson, Parmenter, & Low,

2016; Barrena-Martinez, Lopez-Fernandez, Marquez-Moreno, & Romero-Fernandez (2015). P1 emphasized that "sustainability is one of the most important recruiting tools for the next decade, arguing that between 30-50% of college graduates have sustainability as one of their core values" and P4 reported that a physician couple described how the hospital's environmental stewardship was one of the primary reasons for joining ABC Hospital among many other possibilities. Figure 1 shows how ABC Hospital's HCWM strategies enhanced their competitive advantage.

Creating a Competitive Advantage

Figure 1. Strategies for minimizing waste management operational costs

Feng et al. (2014) found that a fit between the adoption of EMS and a commitment to organizational learning orientation improved firm's performance. Internal processes that reduced waste and improved technical and organizational learning also led to enhanced financial performance (Feng et al., 2016). Innovation results in continuous improvements and reduces costs by increased efficiency of resources

(Baumgartner, 2014). ES processes at ABC Hospital have contributed to the improvement of processes and cost savings thus, enhancing organizational and financial performance.

Implications for Social Change

Healthcare organizations have been slow to move beyond meeting minimum regulatory standards for the management of their hazardous and nonhazardous waste. This study has the potential to change healthcare leader's perspectives on how to minimize operational expenses without compromising patient care through environmentally sound waste management strategies. Typically, to reduce operational costs, healthcare leaders consolidate departments, discontinue services, reduce staffing, or purchase inferior products. With most of these cost reduction strategies, there are potential consequences to the communities in which they reside. Possible consequences include, but are not limited to increased, community unemployment, decreased quality of patient care, medication errors, longer treatment waiting times, and even the potential for loss of life.

As an industry, healthcare faces enormous challenges as the population ages and utilization increases. While the healthcare industry continues to reform, healthcare leaders must find innovative ways to minimize their operational expenses and look at healthcare as a business problem that is broader in scope than just fixing sick people. Every individual within the hospital's surrounding community is a potential patient. By not contributing to the degradation of their surrounding environment, healthcare leaders are acting in a socially responsible way by reducing the amount of waste sent to landfills,

minimizing the risk of spreading infectious diseases, and contributing to the global fight against climate change.

Recommendations for Action

The purpose of this study was to explore what strategies hospital leaders could implement to reduce their waste management operational expenses. As pollution, waste, and environmental issues continue to affect population health and climate change, the healthcare industry is facing increased scrutiny as the second largest producer of trash. Because every HCO is unique and consist of many diverse individuals, there is not a single set of strategies or processes that will solve every hospital's waste management issues. Not all hospital leaders will arrive at the same conclusions nor will they be successful in their endeavors unless they themselves are committed to sustainable waste management practices and include that commitment in their organization's mission, vision, and values statements. Leaders must be able to communicate this commitment to the clinical and support staff and promote a sustainability culture throughout the system that allows staff to experiment with innovative ideas on resolving their waste management and ES goals as a team.

Within each organization are individuals with capabilities of creating innovative ways of investigating what processes to change or implement that best fits their organization's unique characteristics. As this study revealed, at the very least, hospital Boards must recruit and hire Chief Executives with the mindset to think beyond the walls of the healthcare systems. Healthcare leaders must think broader and view health care as a community issue deserving of their full attention. Organizational leaders should

develop strategic plans that address sustainability initiatives into the short and long-term plans. Innovation is the key to firm performance that can set them apart from their competitors.

While senior leadership and organizational culture are at the heart of the strategies, mid-level managers are the individuals that put those strategies into actions. A qualified, passionate sustainability manager is critical to fulfilling the waste management implementation challenge. Because healthcare workers at HCOs generate all forms of hazardous waste, expert knowledge of hazardous waste and its treatment and disposal is critical to the development of innovative waste management processes. Teamwork within the sustainability department and system wide is also essential to gain insight into processes that cross departmental boundaries where there is little room for contentious actions or territorialism.

I intend to share these results with business and academic leaders in healthcare to engender a better understanding of how environmental stewardship can offer a win-win solution to waste management issues for HCOs and communities alike. Because there is a trivial amount of information on this subject in the literature originating from the U.S. that is peer-reviewed, I may also share this knowledge by publishing a condensed version of this manuscript in an academic peer-reviewed journal. Sharing this information might assist other sustainability managers with the necessary knowledge that will move their senior leadership into developing a culture of sustainability within their organizations.

Recommendations for Further Research

In the U.S. organizations currently exists that have as their purpose to assist HCOs in becoming greener. These organizations contain a wealth of information on processes that HCOs can use to begin their sustainability initiatives as well as self-reported case studies about their sustainability efforts and cost savings. However, because these data are self-reported, other HCOs' leaders cannot verify the true financial benefits ES activities can present their systems. Therefore, I would propose the following recommendations for future research:

- Conduct a multi-site qualitative case study to expand on or uncover other organization's successful waste management strategies and the cost savings generated from those strategies.
- Conduct a single case study focusing on the attitudes of hospital staff and their commitment to waste management strategies and the cost savings generated from those strategies.
- Conduct a quantitative study to determine the relationship between organizational performance measures and the incorporation of sustainability into their mission, vision, and values and successful waste management strategies and the cost savings generated from those strategies.
- Conduct a quantitative study to determine the relationship between engaged sustainability leadership, organizational culture, teamwork, and

innovation and successful waste management strategies and the cost savings generated from those strategies.

One of the limitations of this study was the inability to directly observe staff performing their waste management processes which, because of the innovative methods ABC Hospital's Director of Sustainability, could have provided addition rich information. Therefore, a further recommendation is that researchers perform either a single case or multiple case qualitative study where the researcher observes staff and the facilities' processes directly.

Reflections

I entered this DBA Doctoral Study journey with cautious excitement knowing that it would be rigorous and challenging, but if successful, it would be my most significant personal achievement. I had no preconceived idea of what I intended to research and instead let the process guide my topic's determination. My goal was to find a topic that was somewhat unique, meaningful to the healthcare industry, and socially responsible. Waste management is not a glamorous topic; however, I was intrigued by the possibility that if properly implemented these processes could provide HCOs with positive alternatives to enhancing their organizational and financial performance.

I found the entire process stressful yet thought-provoking and rewarding. My experience as a researcher and the different perspectives I have gained are invaluable. However, the study process was quite humbling. I had the preconceived belief that finding a willing HCO participant would be less challenging and in fact, eager to share their successful strategies. I was acutely naïve. As an industry, healthcare is an intense

ever-changing business requiring continuous process changes due to state and federal laws, regulations, and third-party reimbursement issues. I was extremely fortunate to have found an organization willing to allow my inquiry.

When conducting my research, I was quite astonished by the paltry amount of peer-reviewed literature conducted by researchers in the U.S. on my topic. Most of the literature I found stemming from the U.S. were editorials or opinions but little research on waste management strategies. The bulk of the literature emanated from developing countries or was on energy efficiency. After reading the available literature, my personal bias was that my findings would reflect the findings in the literature and on the websites more closely.

Conclusion

The healthcare industry is the second largest waste producing industry using enormous amounts of water, energy, and non-biodegradable carcinogenic plastics and generating all existing classes of waste. Medical waste disposal is costly and places individuals and communities at risk for contamination by hazardous waste materials such as blood or body fluids, mercury, and other toxic substances. HCOs that implement environmentally sustainable waste management strategies could help reduce the amount of waste sent to landfills, minimize the risk of spreading infectious diseases, and contribute to the global fight against climate change.

In this study, I explored strategies that hospital leaders used to minimize waste management operational expenses at a healthcare system in the Mid-Western U.S. Based on the thematic analysis, the following four primary themes emerged: (a) engaged

leadership, (b) incorporate sustainability into the mission, vision, and values of the organization (c) create an organizational culture of sustainability and (d) innovation. An additional subtheme under organizational culture is teamwork that is an integral component of successful investigation and implementation of waste management processes. Hospital leaders that wish to distinguish themselves from their competitors, gain a competitive advantage, decrease operational expenses, and improve organizational performance should explore the capability of implementing these waste management strategies.

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Appendix A: Organizational Permission

Letter of Cooperation from a Research Partner

Andrea Clark
Doctoral Student

October 14, 2017

Dear Andrea,

Based on my review of your research proposal, I give permission for you to conduct the study entitled Waste Management Minimization Strategies in Hospitals within the Gundersen Health System. As part of this study, I authorize you to interview hospital managers and healthcare workers who are involved with waste management procedures including high-level managers, waste handlers, and clinical personnel at the facility. Participants will be recruited based on their knowledge of the implementation of waste management strategies that minimized operational cost. Semi-structured interviews will take approximately 30 minutes and will be conducted over the telephone or via Skype. Snowball sampling will also be used to ask recruited participants to identify other key individuals who might provide further information-rich evidence on the hospital's waste management strategies. Member checking will take place over the telephone or via Skype. Member checking will take no longer than 20 minutes.

In addition to face to face interviews, the following documents will help to support the study and the ability to reduce waste management operational costs:

a. Financial documents related to the operational expenses over at least a two-year
   period of time associated with waste management processes
b. Waste Management Policies and Procedures
c. Human Resources Training Documents related to waste management
d. Contracts with waste management treatment, recycling, and disposal
e. Memos and reports related to waste management strategies

Upon completion of the study, results will be disseminated with suggestions that might provide additional strategies to further improve waste management processes. Individuals' participation will be voluntary and at their own discretion.

We understand that our organization's responsibilities include: allowing personnel familiar with the hospitals waste management strategies to participate in the interviews if they choose to do so and, and offering supporting documentation as described above. We reserve the right to withdraw from the study at any time if our circumstances change.

The student will be responsible for complying with our site's research policies and requirements, including our IRB process.

I understand that the student will not be naming our organization in the doctoral project report that is published in ProQuest.

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

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

Sincerely,

P1 , MD
ABC Hospital System

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

Appendix B: Interview Protocol

Introduce self to participants.
Present consent form, review contents with participants and have the participant sign the consent form. Answers any questions or concerns participants may have.
Provide participants with a copy of the consent form.
Start audio recording.
Note the date and time of recording in journal.
Begin interview with question #1; follow through to the final question.
Interview questions: 1. What was the impetus for beginning to address waste management issues at this facility? 2. How has your role at the hospital helped to facilitate decreased waste management operational costs? 3. What waste management strategies have you implemented? 4. How have these strategies helped minimize costs or improve the related processes at this facility? 5. What were some challenges you met while implementing these strategies? 6. How did you overcome these challenges? 7. What additional waste management strategies have you considered that would help you minimize operational costs?
Observe participant and take notes of non-verbal cues.

End interview, thank participant, and arrange the second interview for respondent validation (member checking).
Thank the participant(s) for their role in the study. Restate contact numbers for follow up questions and concerns from participants.
Introduce follow-up interview (member checking and set the stage).
Share a copy of the succinct synthesis for each question.
Bring in probing questions related to other information that you may have found during the data analysis process.
Walk through each question, read the interpretation, and ask participants for feedback
Did I miss anything? Or, what would you like to add?