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Exploring the strategies to implement a sustainable energy program in Hong Kong Public Hospitals

Terry Ting
Walden University

Walden University

College of Management and Technology

This is to certify that the doctoral study by

Terry Ting

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Review Committee
Dr. Craig Martin, Committee Chairperson, Doctor of Business Administration Faculty

Dr. Roger Mayer, Committee Member, Doctor of Business Administration Faculty

Dr. Edward Paluch, University Reviewer, Doctor of Business Administration Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
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Abstract

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Abstract

Healthcare is one of the most energy-intensive industries because of its 24 hour-a-day and 7-days-a-week operation model. Climate change, due to environmental pollution, has increased the incidence of respiratory disease, cardiovascular disease, and cancer, which further overload the financial burden of our healthcare system. The National Health Service Sustainable Development Unit suggested that a sustainable healthcare sector also requires using their resources in an efficient and responsible way. Hong Kong public hospitals are facing this problem along with high energy expenditure. The purpose of this qualitative, multiple site case study was to explore strategies for Hong Kong's public hospital leaders to develop and implement a sustainable program to reduce energy consumption. A purposive sample consisted of five local public hospital leaders that had successfully implemented a sustainable energy at their hospitals and received the 2014 Certificate of Merit of The Hong Kong Awards for Environmental Excellence. Semistructured interviews and document reviews were the data analysis methods for this study. The findings from the data analysis suggested that five major themes arose from the data: (a) external and internal driving forces, (b) leadership, (c) governance, (d) building a sustainable culture, and (e) performance measures. The recommendations of this study may lead to improving the use of energy in an efficient and responsible manner at the local public hospitals, reducing the hospital energy consumption cost, and reducing the disease incidences caused by environmental pollution.

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Dedication

I would like to dedicate this study to my wife Janice, who has given me extraordinary support throughout my whole doctoral study journey. I would also like to dedicate this study to my sons Maurice and Moses, they are my reasons for always striving to better myself.

Acknowledgments

I want to thank my committee chair, Dr. Craig Martin, the second committee member, Dr. Roger Mayer, the URR, Dr. Edward Paluch, and the program director, Dr. Freda Turner. Their dedication and guidance has been invaluable and it is an honor to work with a group of great scholars.

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Section 1: Foundation of the Study

The establishment of sustainable practice in healthcare institutions has been a major concern in most developed countries because the healthcare institutions and the public can benefit from it (McGain & Naylor, 2014; Qadir et al., 2014). A hospital operates 24 hours a day and 7 days a week; the natural resources consumption for maintaining a safe and stable operation is considerably high (Kaplan, Sadler, Little, Franz, & Orris, 2012). Although global studies show that hospitals can reduce the negative effects on the environment by implementing sustainable initiatives such as energy and water preservation programs and waste management strategies only 30% of Hong Kong hospitals employ an effective and applicable sustainable program. As healthcare costs are rising globally, the hospital leaders or the management can reduce energy costs by introducing a sustainable energy program at the hospital (Berwick & Hackbarth, 2012; McGain & Naylor, 2014; Qadir et al., 2014).

Background of the Problem

The growth of the global population has depleted the natural resources in most developed countries (Alam & Kabir, 2013). The rapid growth of healthcare services due to increased demand and changes in disease etiology has contributed to an additional burden of environmental pollution (Dall et al., 2013; McGain & Naylor, 2014). Healthcare services in major developed countries are among the most polluting industries (Berwick & Hackbarth, 2012; Short, Lomas, Giridharan, & Fair, 2012). Researchers have suggested that healthcare leaders look for effective strategies to reduce greenhouse

emissions by developing and implementing a sustainable program for their healthcare institutions (McGain & Naylor, 2014; Sadler & Guenther, 2015).

Corporate sustainability measures of an organization suggested the stakeholders' well-being in three major areas including a social aspect, financial aspect, and environmental aspect (Stoughton & Ludema, 2012). An organization can improve both long- and short-term competitive advantages by incorporating sustainability into the company strategy (Lloret, 2016). For the healthcare setting, the benefits of introducing a sustainable program for hospitals include reducing costs, increasing the brand image, and improving public health status by reducing pollution (Harvey, 2013; Trong, 2012). Energy costs are high in Hong Kong public hospitals (Tong & Fong, 2014). A well established sustainable energy program is promising for reducing energy costs (Rohde & Martinez, 2015).

Implementing sustainable practices is a challenge to many business leaders because it will incur changes to the company internally and externally (Stoughton & Ludema, 2012). However, Hong Kong studies on how hospital leaders can successfully employ a sustainable energy program are rare. Studies pointed out that the use of the corporate sustainability model developed by Epstein in 2008 to design and implement sustainable practice can be applied to business firms (Epstein & Buhovac, 2014; Kuei & Lu, 2013; Stuart, 2013).

Problem Statement

Extensive hospital activities in Hong Kong have caused an increase in energy consumption (Hospital Authority Annual Report, 2013). Tong and Fong (2014) indicated

that the energy expenditure of 42 public hospitals in Hong Kong was high, reaching around 100 million U.S. dollars per year. A study estimated that a hospital can save up to 20 million U.S. dollars of energy cost in 5 years by implementing a sustainable energy program (Kaplan et at., 2012). The general business problem is that hospital leaders are often unable to control energy expenses that can lead to an increase in operating costs. The specific problem is that the strategies necessary to develop and implement an effective sustainable energy program in Hong Kong hospitals are not understood by some leaders in that city-state.

Purpose Statement

The purpose of this qualitative, multiple site case study was to explore the strategies necessary to develop and implement an effective sustainable energy program in Hong Kong hospitals. The participants of this study were the hospital green committee chairpersons of five public hospitals in Hong Kong that received outstanding achievement recognition from the local government. Hospitals are one of the most energy-intensive facilities; implementing a sustainable energy program will help to reduce pollution and energy costs (McGain & Naylor, 2014; Qadir et al., 2014). The implications for positive social change may include providing findings as a reference for hospital leaders to redirect the saved resources from a sustainable energy program to improve patient care and reduce pollution (McGain & Naylor, 2014).

Nature of the Study

I employed qualitative research methods with a multiple case study design to explore the strategies for Hong Kong hospital leaders to develop and implement a

sustainable energy program to increase cost effectiveness. Fassinger and Morrow (2013) showed that researchers can use a qualitative research approach to engage the participants in a research study and to address their personal experiences, emotions, motivations, and inner life in the study. Researchers can use the qualitative research method to understand the phenomena by describing, decoding, translating, and understanding data (Sergi & Hallin, 2011). For quantitative research, researchers can use it to investigate the observed phenomena by statistical or computational techniques. Researchers using quantitative research quantify data and generalize results from a sample of the population of interest and measure the incidence of various views and opinions in a chosen sample (Yin, 2014). The mixed method is an approach for the researchers to understand the phenomena by combining both qualitative and quantitative methods to analyze data, and it is suitable for researchers because the results from one study can support the other study (Klassen, Creswell, Plano Clark, Smith, & Meissner, 2012). I used the qualitative research method to understand the behavior of Hong Kong healthcare leaders in responding to sustainable practice in the hospitals. I used the qualitative method in this study because it is a method that researchers use to gather an in-depth understanding of a specific human behavior in a group or organization, and social, political areas. A researcher can use the qualitative method to explore human behavior on how the participants can apply measures to handle the specific problem (Hyett, Kenny, & Virginia Dickson-Swift, 2014).

Yin (2014) suggested that researchers use a case study design when they are looking for an answer to how and why questions, and when researchers cannot manipulate the behavior of those involved in the study. Case study research design is an

approach to understanding a particular phenomenon within its context using a variety of data sources, and researchers can use the case study approach to obtain an in-depth appreciation of an issue, event, or phenomenon of interest, in a real-life context (Crowe et al., 2011). The phenomenological design is a method to explore and understand the participants' living experience (Ardley, 2011). So that the phenomenological design may not apply to address the research question of this study on what are the strategies for Hong Kong hospitals leaders to develop and implement sustainable energy program to reduce energy cost. Ethnographic design is an approach to explore the relationship between the participants' culture and behavior, but is not a suitable design for this study (Christiansen, 2011; Nite & Singer, 2012)

Qualitative case study research design is an approach for the researcher to understand a particular phenomenon within its context using a variety of data sources (Lewis, 2015). Yin (2014) suggested that researchers should use case study design when they are looking for an answer how and why questions, and when researchers cannot manipulate the behavior of those involved in the study. Also, researchers can use case study design to find out the contextual conditions because they believe they are relevant to the phenomenon under study. Finally, Yin (2014) pointed out that the researcher should use a case study design when they do not know the boundaries of the phenomenon and the context is not clear. As a researcher, I did have the power to manipulate the decision of the healthcare leaders to adopt sustainable energy practice at their hospitals. I used the qualitative case study research design to understand why and how the local healthcare leaders are developing and implementing a sustainable energy program in their

hospitals, and how to facilitate the incorporation of the sustainable energy program to obtain costeffectiveness by reducing energy costs.

Research Question

The research question of this study is, "What strategies do the hospital leaders use to develop and implement a sustainable energy program to reduce energy cost?"

Interview Questions

1. Can you tell me what corporate sustainability measures are implemented in your hospital?
2. What are the external and internal driving forces/motivations to facilitate the implementation of a sustainable energy program in your hospitals?
3. As the leader of the hospital green management committee, what is your role in managing sustainable practice in the hospital?
4. What are your management strategies/approaches/tools to facilitate the successful implementation of the sustainable energy program at your hospital?
5. How do you comment on the organization structure of green management committee at your hospital?
6. How can you mobilize and motivate your staff/stakeholders to develop and implement a sustainable energy program at your hospital?
7. What skill, knowledge, or training for your staff is needed for practice in a sustainable manner?
8. What are the hospital performance measures for the sustainable energy program?

9. Can you tell me the challenges/barriers to implementing the sustainable energy program at your hospital and how do you overcome them?

Conceptual Framework

The aim of this study was to explore the strategies for the Hong Kong public hospital leaders to develop and implement a sustainable energy program to reduce energy costs. The conceptual framework is the system of concepts, assumptions, expectations, beliefs, and theories that support the design and the problem statement of the study (Timmermans & Tavory, 2012). I used the corporate sustainability model as the conceptual framework to explain the aim of the study in a systematic way and to view the phenomenon of energy sustainability in hospitals.

The corporate sustainability model (CSM) developed by Epstein in 2008 provides a description of the drivers of corporate sustainability performance (Epstein, 2008). The CSM contains the elements of social, environmental, and financial dimensions of sustainability as its foundation, and consists of four major drivers. The CSM is a comprehensive approach to examining, measuring, and managing the drivers of corporate sustainability, and has been tested and revised in both academic and managerial studies (Epstein & Buhovac, 2014).

The CSM includes the drivers of corporate sustainability performance, and the leaders can use them to affect the organization performance and the consequences of those actions on corporate environmental, social, and financial performance (Epstein, 2008). In CSM the sustainable organization activities consist of inputs, processes, outputs,

and outcomes, which are necessary for the implementation of a sustainability strategy in an organization (Epstein, 2008).

The inputs include (a) external context, (b) internal context, (c) business context, and (d) human and financial resources (Epstein, 2008). The processes include (a) leadership, (b) sustainability strategy, (c) sustainability structure, and (d) sustainability systems, programs, and actions (Epstein, 2008). The outputs include sustainability performance and stakeholder reactions (Epstein, 2008). Finally, the outcomes include the long-term corporate financial performance and sustainability performance. Sustainable practice at the hospital can increase cost effectiveness and can reallocate the saved resources into other service improvement initiatives (McGain & Naylor, 2014). The CSM is a valuable guideline for Hong Kong healthcare leaders to understand which strategies are necessary to develop and implement a sustainable energy plan to improve cost effectiveness and financial status for the public hospitals in Hong Kong.

Operational Definitions

Corporate sustainability: The ability of a firm to grow over time by effectively meeting the expectations of diverse stakeholders in social, financial, and environmental areas (Montiel & Delgado-Ceballos, 2014).

Corporate sustainability management: A management concept that states that the viability of the company is closely related to the success of the company to provide profit without neglecting the benefits of other stakeholders in social and environmental aspects (Ameer & Othman 2012).

Corporate sustainability model (CSM): A conceptual framework that describes the drivers of corporate sustainability performance that the management can use to influence performance, and the outcomes of the sustainability actions for social, economic, and financial performance (Epstein & Buhovac, 2014). The CSM describes the sustainability activities in four major steps including input, process, output, and outcome (Epstein & Buhovac, 2014).

Sustainable energy program: An important utility system resource that can also reduce greenhouse gasses, save money for customers, and generate jobs. In response to both economic concerns and climate change, legislators and regulators have supported energy efficiency at unprecedented levels (American Council for an Energy-Efficient Economy, 2012).

Sustainable healthcare: Sustainable healthcare is to provide high-quality health services to the customer, the service should benefit the social, financial, and environmental aspects, and without exhausting natural resources or causing severe ecological damage (Patel & Soundararajan, 2015). Sustainable healthcare initiatives involve greening the energy consumption, water consumption, waste management, transportation, and building facilities to efficiently and responsibly use resources (Patel & Soundararajan, 2015).

Assumptions, Limitations, and Delimitations

Assumptions

An assumption is a belief or feeling that something is true or that something will happen, although there is no proof (Oxford University Press, 2014). The assumptions

include that the participants of this study answered the interview questions in an honest and candid manner, and that they have all the required knowledge and experiences to answer the interview questions. Also, the elements present in the literature review can be transferred and applied across the healthcare industry, and each of these elements supports the successful implementation of sustainable measures that will eventually lead to long-term benefits for local hospitals.

Limitations

A limitation is a point or level beyond which something does not or may not extend or pass (Oxford University Press, 2014). One of the limitations of this study is that the participants' responses to the research questions may not be the best information, although they are the most appropriate individuals to participate in the study due to their official positions on the hospital green committee. Another limitation is the fast advancements in sustainable technologies. All of the participants' input is according to what current technologies can provide; technology advancement on the sustainable measure will limit the value of the results of this study because technology improvement can enhance sustainable value to the hospital in the future.

Cultural difference, government policy, readiness to practice green initiatives, and corporate direction of the local hospitals are not comparable to the countries presented in the literature review references of this study. Also, the findings of this study on what strategy is required to develop and implement a sustainable energy program to save energy costs are assumed to apply to Hong Kong because the local studies on healthcare sustainability and a sustainable energy program for the hospital are rare.

Chairpersons of five hospital green committees participated in the interview, but their views on what strategy is necessary for employing a sustainable energy program in public hospitals in Hong Kong to effectively reduce energy consumption may not fully reflect the views of the other 37 public hospitals in Hong Kong. The findings may apply to hospitals of similar size, within similar regions, or in the same setting. The study was during a period of good economic health; the 2014 gross domestic product is estimated to be 272.5 billion U.S. dollars (Hong Kong Trade Development Council, 2014). The findings of this study may not apply to a situation of the economic downturn.

Delimitations

Delimitation is the boundary set for the study, and which the researcher will not look into in detail (Svensson & Doumas, 2013). The scope of this study was to explore the strategy for local hospital leaders to employ a sustainable energy program in public hospitals in Hong Kong to effectively reduce energy consumption using a qualitative multiple case study approach. Quantitative findings, such as financial achievement of the hospital by implementing a sustainable energy program and indicators of sustainability, performance will not be the focus of this study.

The scope of this study did not include any proposal for management or an operations framework for hospital leaders to implement a sustainable energy program. The research interview data from five of the local public hospital green committee chairpersons limits the ability to generalize the findings to the whole public hospital system in Hong Kong. Finally, the researcher of this study did provide a solution to improve sustainability performance for Hong Kong public hospitals because the study

will look into the sustainable energy program alone, which cannot reflect the other criteria of corporate sustainability in healthcare.

Significance of the Study

The Sustainable Development Unit of National Health Service identified that hospitals use up two and a half times more energy than commercial buildings, and they spend more than 8.5 billion U.S. dollars annually on energy (Naylor & Appleby, 2013). The total annual energy consumption of hospitals and clinics of the Hong Kong Hospital Authority was around 35,000,000 gigajoules in 2012–2013, and the rising trend of energy consumption is due to the increase in hospital activities (Hospital Authority Annual Report, 2013). Tong and Fong (2014) indicated that the energy expenditure of 42 public hospitals in Hong Kong was high, reaching around 100 million U.S. dollars per year.

Energy usage can cost between 1-3% of a hospital's operating budget and hospital leaders can apply a sustainable energy program to save money on energy costs and reallocate the resources to other hospital initiatives to improve service quality (McGain & Naylor, 2014). Hospitals in Hong Kong operate 24 hours a day and 7 days a week, and the use of energy in providing medical services in Hong Kong hospitals is comparable to the U.S.

Contribution to Business Practice

Business leaders may benefit from the results of my study because I explored the strategy necessary for local public hospitals to develop and implement a sustainable energy program. The study suggests that hospital leaders can reduce energy costs by implementing sustainable energy at their hospitals (Kaplan et al., 2012). Also, there are

few external drivers that the local hospitals must face in budgeting for energy expenditure to maintain their financial well-being, which includes the increase in energy costs, supply challenges, and the globalization of climate regulations (Naylor & Appleby, 2013).

Implication for Social Change

Society may benefit from the results of my study because the report of the Hong Kong Environment Protection Department (2015) revealed that only 13 out of 42 local public hospitals had a sustainable plan for waste and carbon reduction, and there were only six public hospitals that had implemented a sustainable energy plan and received the Hong Kong Green Organisation Certification Award in 2014. According to the Hong Kong Hospital Authority annual report (2013), they estimated that the total healthcare expenditure of the local public hospitals was 2.5% of the total Hong Kong gross domestic product. Although the Hong Kong government supports the entire healthcare cost of the local public hospitals, the saved money is a valuable resource for other service improvement initiatives to achieve the organizational goals. By exploring a strategy for local hospital leaders to employ a sustainable energy program in public hospitals in Hong Kong to reduce energy consumption, the healthcare leaders can cut energy costs and reallocate resources to other hospital activities to improve service quality (McGain & Naylor, 2014).

Healthcare is a major contributor to climate change; energy consumption accounts for 24% of the carbon dioxide emissions in England (Barna, Goodman, & Mortimer, 2012). In addition to the financial benefit of implementing a sustainable energy program, the reduction of carbon emissions from hospitals can help alleviate climate change, which

can reduce the incidence of disease caused by environmental pollution such as asthma, respiratory disease, and further improve the healthcare financial burden (Thompson, Frith, & Pencheon, 2013).

A Review of the Professional and Academic Literature

I expanded the academic literature related to the topic of this study to exploring the strategy for Hong Kong hospital leaders for employing a sustainable energy program in public hospitals to reduce energy consumption. The literature and peer-review journals related to this topic help explain the topic of this study. A literature review involved the selection, synthesis, and evaluation of the published articles on healthcare sustainability and the effect of sustainable practice in hospital on cost effectiveness. The content of the literature review also included the currently available research on sustainable energy measures in hospitals to improve energy efficiency and cost effectiveness. A literature review could help to build my research on the top of existing research on the same topic and fill in the gaps in current knowledge (Denney & Tewksbury, 2013).

The literature search of peer-reviewed journals in this section provided a better understanding of the basic knowledge on the current sustainability issues related to healthcare services. This part further investigated the definition of sustainability practice in hospitals, the effect of energy-saving plans in hospitals, a conceptual framework for developing and implementing sustainable practices, and driving factors for sustainability, which will lead to suggestions for the topic of this study. The online databases used to find the selected articles in the literature review included Academic Search Complete/Premier, Business Source Complete, PubMed, Emerald Management Journals,

ProQuest Central, Sage Premier, and Science Direct. This selection of journals' databases contains peer-reviewed journals on corporate sustainability practices in healthcare settings. I searched the peer-reviewed journal for the topic of this study by using keywords that included *corporate sustainability, corporate social responsibility, sustainable healthcare, green practice in hospitals, and sustainable energy programs in healthcare or a hospital,* and *energy efficiency programs*.

The initial search provided an overview of the literature that discussed these topics. A further refinement of limiting the research to scholarly peer-reviewed literature published after 2009 allows additional in-depth article on the topic of this study. There were 99 reference articles in the literature review, which included dissertations, technical reports, books, and relevant internet websites in the search process, and 95 of them, representing 96% of these findings, were current. Among these 99 articles, 87 of them, representing 88%, were peer-reviewed journals with publication dates within 5 years of my anticipated graduation date of 2017. Table 1 illustrates the classification of the sources reviewed in this literature review. The literature review consists of five themes, and these themes helped to provide an overall understanding of current research on healthcare sustainability and paved the way for the development of my research topic: the necessary strategies for Hong Kong hospital leaders to develop and implement a sustainable energy program in Hong Kong public hospitals to increase cost-effectiveness.

I organized my thesis into seven major topics which includes the following (a) conceptual framework for corporate sustainability, (b) sustainable issues of healthcare, (c) definition of sustainable healthcare, (d) governance and strategic framework of

sustainable practice in healthcare organization, (d) financial issues of sustainable practice in healthcare organization, (e) assessment of hospital suitability performance, (f) opponents of the corporate sustainability, (g) barriers to corporate sustainability, and (h) overview of the healthcare system and hospital green practices in Hong Kong. I reviewed the relevant current literature on each topic to explore the corporate and healthcare sustainability issues in details.

Table 1

Synopsis of Sources in the Literature Review

Reference type	Number	Less than 5 years	Greater than 5 years
Research-based peer-reviewed journal	89	87	2
Dissertation	1	1	-
Book	5	3	2
Website	4	4	-
Total	99	95	4

Conceptual Framework for Corporate Sustainability

The CSM developed by Epstein in 2008 provides a description of the drivers of corporate sustainability performance (Epstein, Buhovac & Yuthas, 2010). The CSM uses the social, environmental, and financial dimensions of sustainability as its foundation and consists of four major drivers. The CSM provides a comprehensive approach to examining, measuring, and managing the drivers of corporate sustainability and has been extensively tested and revised in both academic and managerial studies and implementations (Epstein & Buhovac, 2014).

Epstein (2008) suggested that there are four drivers of corporate sustainability performance in the CSM: inputs, processes, outputs, and outcomes, which the manager

can apply to affect the sustainability performance and financial benefit for the organization. The inputs include (a) external context, (b) internal context, (c) business context, and (d) human and financial resources. The processes include (a) leadership, (b) sustainability strategy, (c) sustainability structure, and (d) sustainability systems, programs, and actions (Epstein & Buhovac, 2014). The outputs include sustainability performance and stakeholder reactions. Finally, the outcomes include the long-term corporate financial performance and sustainability performance.

Scholars' studies on corporate sustainability model. Scholars use Epstein's CSM because it is a well-established conceptual framework for corporate sustainability studies in the business field (Borkowski, Welsh, and Wentzel, 2012; Kuei & Lu, 2013; Stuart, 2013). Stuart (2013) used CSM to study the relationship of leadership with building corporate sustainability branding and suggested that transformational leader is favoring an organization in implementing corporate sustainability. Two scholars used CSM as the framework to look into the way to implement sustainability management for quality performance measurements and suggested a quality management conceptual framework that contains corporate sustainability as one of the essential elements (Kuei & Lu, 2013). Borkowski, Welsh, and Wentzel (2012) used CSM to measure the success of an international organization in implementing corporate sustainability and suggested improvements for sustainability reporting.

Kaplan et al. (2012) suggested that a sustainable practice at a hospital can increase cost-effectiveness, and leaders can reallocate the saved resources into other services' improvement initiatives such as increasing staff strength, employee development,

technology advancements, and facilities improvement. The CSM provided a valuable guideline for Hong Kong healthcare leaders to understand the concept of corporate sustainability and to determine the strategies necessary to develop and implement a sustainable energy plan to improve cost effectiveness and financial status for the public hospitals in Hong Kong.

Contexts for corporate sustainability. The external context, such as government regulations on the environment, waste disposal, nondiscrimination, and safety working conditions, will have a significant effect on the formulation and implementation of a sustainability program (Epstein & Buhovac, 2014). Ioannou and Serafeim (2014) examined the effect of mandatory sustainability reporting on several measures of socially responsible management practices in 58 countries, and suggested that the sustainability performance in these countries has improved. The improvements included sustainable development, employee training for sustainability measures, and corporate sustainability governance. Similarly, Yuan, Kang, Yu, and Hu (2011) identified in their study that the external context has a significant effect on the sustainability performance; China reduced energy consumption by 19.1% after implementing an energy conversation policy in 2006.

The internal context is another input driver to facilitate sustainability performance. A company that has a strong vision and mission to carry out corporate sustainability will help the company to accomplish their goal (Epstein & Buhovac, 2014). Thompson (2013) identified that healthcare organizations should include a sustainability element in their organizations' vision to facilitate sustainability development and implementation. Studies show that a sustainability vision is crucial in successful sustainability performance.

Factors that determine the success of corporate sustainability management include the ability to integrate sustainability into an organization's vision, effectiveness to articulate the vision to the employees, and ensure that the sustainability vision is part of decision making and company activities (Caprar & Neville, 2012; Robinson & Boulle, 2012).

The business context, such as the nature of the industry, affects the corporate sustainability performance of a company. Companies with high impact of social, and environmental may have a sustainability performance (Epstein & Buhovac, 2014). However, Ameer and Othman (2012) argued that companies that participate in public utility and energy production perform better in environmental protection than other industries such as healthcare, financial, and customer service. Internal and external business contexts are the important driving forces to implement corporate sustainability in an organization. Studies suggested driving forces such as governance, leadership, and company strategy on corporate sustainability are playing an important role in corporate sustainability development.

Governance and strategic framework for sustainable practice. Robinson and Boulle (2012) suggested that there are three levels of sustainability achievement, namely, non sustainability, weak sustainability, and strong sustainability. Strong sustainability will need the engagement of management. Also, studies have shown that corporate sustainability is an easy concept to understand but difficult to implement (Ameer & Othman, 2012; Robinson & Boulle, 2012). Effective governance is the key to success in implementing a sustainable practice in an organization, and the leader is responsible for

setting up principles and practices that will help institutionalize the sustainability concept in the organization (Epstein & Buhovac, 2014).

Galpin, Whitttington, and Bell (2015) indicated that the sustainability-centered cultures reinforce a view that environmental and social values are important to the organization and guide the behavior of managers and employees, and that these cultures can influence the attitudes of other stakeholders. Galpin and Lee Whittington (2012) further supported the importance of leaders' role in corporate sustainability. Galpin and Lee Whittington (2012) suggested a sustainability leadership model, which explains that the sustainability outcome of a firm is the result of the leaders' work in setting up the vision and values and engaging the workforce. The model has macro and micro levels of activity. The macro level includes setting up the mission, values, goals, and strategy (Lee Whittington, 2012). The authors use the human resource value chain theory to illustrate the micro level in staff recruitment, orientation, engagement workforce, and sustainability outcome measures (Lee Whittington, 2012). Studies suggested governance is an important element for an organization to practice in corporate sustainability. The commitment and strategic direction from the top management can drive the company leaders and activities and to facilitate performance to achieve the company goals (Chan, Watson, & Woodliff, 2014).

Governance and leadership in corporate sustainability. Commitment from the management level is an essential element in most of the current sustainability frameworks for effectively implementing sustainable practices. Eccles, Ioannou, and Serafeim (2014) concluded that successfully implementing sustainability direct link to engagement of the

management board. Studies suggested that there is a strong link between governance and leadership and successful corporate sustainability implementation. Epstein (2008) discussed the CSM in his study and suggested that leadership, strategy, structure, and system are important inputs for implementing sustainable practices in a company. Lozano (2013) noted that sustainability strategies are top-down initiatives and are effective with a commitment from the management. Klettner, Clarke, and Boersma (2014) developed a process model for the governance of corporate responsibility that is implemented via a cyclical process of linking commitment, leadership, implementation, and communication. Another study on how management affects the implementation of a sustainable program by Rahardjo, Idrus, Hadiwidjojo, and Aisjah (2013) further suggested five factors for management that can assist the company in implementing sustainable practices. The factors are (a) commitments of shareholders to encourage the management engaged in sustainable issues; (b) the strength of a humanist paradigm adopted by the management; (c) the ability of the management to reach a high standard of sustainability performance; (d) the ability of management to manage a strong sustainability culture; and (e) the ability of management to have mutually beneficial collaboration with the stakeholders. Similarly, Milne and Gray (2013) further identified in their study that commitment from the company is necessary for implementing a triple bottom line in an organization. Corporate, business, and functional level strategies should incorporate sustainability initiatives to implement successful corporate sustainability.

A sustainability-centered culture reinforces the core value of environmental and social responsibilities and engages stakeholders to collaboration in a sustainable business

(Galpin et al., 2015). Another study by Galpin and Lee Whittington (2012) suggested a sustainability leadership model, which explains that the sustainability outcome of a firm is the result of the leaders' work in setting up vision and values and engaging the workforce. However, Schneider and Meins (2012) argued that the management implementation of sustainability-oriented organizational structures and managerial instruments is not promising for sustainability performance. Stoughton and Ludema (2012) provide an integrative model for how a commitment to sustainability emerges at the organizational, functional, and individual levels within organizations. If a company wants to have long-term success in sustainability, it should have strategies at the organizational level, the functional level, and individual level. Senior staff should define sustainability, and align sustainability with business purposes and drive the sustainability priorities. However, the lack of strategic leadership in corporate sustainability measures may end in failure in some organizations (Strand, 2014). Leadership is one of the most important elements to assist an organization to go through a cha

nge (Holten & Brenner, 2015). Studies suggested that a company with strong leadership would help the company to develop, implement and outperform in corporate sustainability (Milne & Gray, 2013; Stoughton & Ludema, 2012).

Strategy for corporate sustainability. Corporate **s**ustainability concerns the impact of the business activities on the ecosystems, societies, and environment of the future. Sustainable corporations should plan their business activities according to their strategy (Ameer & Othman, 2012). A clear and good business strategy is the key for a company to gain a competitive advantage and achieve high performance (Chen & Jermias,

2014). Strategies for corporate sustainability from the top management with an effective reward system are essential for successful implementation of sustainable activities (Klettner et al., 2014). Management shall establish a clear strategy for accomplishing environmental, social, and financial outcomes. Global companies believe sustainability is becoming important to their business strategy, but most of them do not properly align their business activities and value for a long-term sustainability outcome (Galpin & Lee Whittington, 2012). A corporate sustainability strategy for an organization is an important driver for successful sustainable development, and it directs the company to the challenges of social, legal, political and economic requirements under the conditions of market competition (Schaltegger, Lüdeke-Freund, & Hansen, 2012). In a recent review of governance for corporate sustainability, some authors suggested that the commitment of management to a robust organizational structure and strategy is necessary for successful implementation of sustainable practices in a company for financial rewards (Klettne et al., 2014).

Another study on sustainability strategies suggested that linking the company strategy to sustainable outcomes is related to profitability and shareholder interests (Butler, Henderson, & Raiborn, 2011). A conceptual framework related to sustainability strategy management, named *Sustainability as an integral part of strategy*, suggested that when a company decides to achieve sustainability outcomes, management should take sustainability measures into account during their decision-making process and incorporate them into corporate, business, and functional levels (Galpin et al., 2015). A company that have a clear business strategy from the management is an essential element

for them to obtain good performance and achievement. Studies suggested that a company should have a clear business strategy to successfully implement and outperformance in corporate sustainability (Ameer & Othman, 2012; Butler, Henderson, & Raiborn, 2011; Chen & Jermias, 2014).

Sustainability framework for healthcare. For healthcare services, the Sustainable Development Unit of National Health Service (2013) identified the importance of introducing the concept of corporate sustainability in healthcare, and they established a route map for sustainable health, which explained the crucial role of governance and leaders in achieving sustainable health services. The route map has system governance as one of the six themes for healthcare services to become sustainable care, and suggested that leaders should embed sustainability into mandatory board business, annual reports, regulatory framework, and training. Recent studies provide successful stories in the sustainable journey and suggest that healthcare or hospitals can use the NSH sustainable route map as a framework to develop strategies and implement sustainable activities to improve sustainable initiatives (Pencheon, 2015; Sadler & Guenther, 2015).

Stakeholder management in corporate sustainability. Stakeholder engagement is an essential step in for both the business strategy and sustainable development (Smith, Ansett, & Erez, 2011). Business leaders must identify their stakeholders and engage them to obtain a long-term relationship for achieving organizational goals (Crilly, 2011). Strong corporate governance is essential for successful implementation of corporate sustainability, and stakeholder engagement is one of the integral elements for corporate

governance (Jo & Harjoto, 2012). The stakeholder approach is also a major strategy for sustainability management (Montiel & Delgado-Ceballos, 2014). However, Peloza, Loock, Cerruti, and Muyot (2012) noted that companies that did not communicate well on the sustainability activities with their stakeholders including investors, employees, and the customers could damage the sustainability performance..

The authors of one study investigated 180 companies in the United States of America on their sustainability performance and showed that stakeholder engagement processes were outperformed in companies that adopted a comprehensive set of corporate policies related to the environment, employees, community, products, and customers. Stakeholder engagement processes can help the company to reduce resistant, improve communication, and ensure long-term financial achievement in these high sustainability companies (Eccles et al., 2014). The authors of a study investigating sustainability management have suggested that the ability of management to build mutually beneficial collaboration with the economic stakeholders is one of the important factors for successful sustainability implementation (Rahardjo et al., 2013). Researchers of a study in the healthcare setting have suggested that healthcare professionals in England are not engaged in corporate sustainability activities and encouraged educational events to improve their engagement (Charlesworth, Ray, Head, & Pencheon, 2012). Studies suggested that stakeholders' management is crucial in corporate sustainability development in an organization. Involvement of different level of staff, good communication with the company strategy on corporate sustainability, and balance

between mutual benefits are helpful implement corporate sustainability in a company (Charlesworth, Ray, Head, & Pencheon, 2012; Eccles et al., 2014; Jo & Harjoto, 2012)

Sustainable Issues of Healthcare

Health is a dynamic state of well-being characterized by a physical and mental potential, which satisfies the demands of life commensurate with age, culture, and personal responsibility (Bircher, 2005). A healthcare institution or organization is responsible for providing healthcare services to primary, secondary, tertiary, and public health levels. However, healthcare activities including the procurement of goods and services, energy use by healthcare facilities, transport of staff, visitors, patients and suppliers, and the generation of waste have contributed to the serious pollution issue.

Countries with an advanced healthcare system are the major contributors to climate change. England has a serious situation of environmental issues; their health services produce 25 million tons of carbon dioxide each year (Naylor & Appleby, 2013). In 2009, the American health care sector reported that they accounted for nearly 10% of the country's carbon dioxide footprint (Chung & Meltzer, 2009). There is no national analysis of healthcare carbon dioxide emissions in Australia, but the situation is close to the estimation in England (McGain & Naylor, 2014). Even in China, the largest country with rapid development of healthcare service, the carbon emissions from hospitals increased the burden on the environment and healthcare in some developed regions (Jiang et al., 2012; Liu, Zong, Zhao, Chen, & Wang, 2014).

Researchers of current studies have been working on the relationship of climate change with human health issues. Climate change is the biggest health threat for humans

today, including the spread of infectious diseases and an increase in cardiovascular and respiratory diseases due to extreme heat weather (Altizer, Ostfeld, Johnson, Kutz, & Harvell, 2013; Franchini & Mannucci, 2015; McMichael, 2013). Healthcare leaders can implement measures to reduce carbon emissions than will help to reduce the negative health effect caused by climate change, and which can alleviate the financial burden of health services (Thompson et al., 2013; Woodward et al., 2014). Hospitals and healthcare facilities require a large amount of energy supply to operate 24 hours a day and seven days a week. Fossil fuel combustion and its associated emission of greenhouse gasses, and the high level of electricity consumption of the healthcare system contribute to high healthcare costs due to increased asthma and other respiratory illnesses (Barnes, 2014; Kolokotsa, Tsoutsos, & Papantoniou, 2012).

The environmental effect is a long-term concern to human health. In addition to scholarly work on how pollution affects human health, the World Health Organization reported in the Quantitative risk assessment on the effects of climate change on selected causes of death estimated that climate change is expected to cause approximately 250,000 additional deaths per year between 2030 and 2050 (Hales, Kovats, Lloyd, & Campbell-Lendrum, 2014). The environmental problems generated by the healthcare system and hospitals have serious effects on human health. There is an obvious urgency to reduce the environmental harm by the healthcare services.

The World Health Organization recognized the importance of the population problem caused by global healthcare services and endorsed a sustainable work plan on how to prevent healthcare services from putting further stress on the environment. The

WHO work plan includes raising awareness that climate change is a fundamental threat to human health, to coordinate with partners to ensure health is properly represented in climate change, to review scientific evidence of the effect of global health services on the environment, and to help hospitals reduce the harm to climate change (Barna et al., 2012).

The current pollution problem caused by global healthcare services is worsening. Healthcare leaders in the world have been working on a strategy to reduce the degree of damage to the environment by healthcare services. According to Thompson et al. (2013), countries with advanced healthcare systems have implemented measures in response to this worsening situation. The United Kingdom aims to reduce carbon emissions by 80% by 2050 and suggested that a sustainable strategy should seek transformational change and genuinely foster sustainable models of care (Killip, 2013). The United States is committed to reducing greenhouse gas emissions by 17% below the 2005 level by 2020, and The European Commission aims to reduce greenhouse gas emissions by 8% by 2012 (McGain & Naylor, 2014).

Definition of Corporate Sustainability and Sustainable Healthcare

In the past three decades, companies in the world have studied and implemented corporate sustainability measures to maintain their competitive advantage and to benefit their stakeholders. Hannon and Callaghan (2011) stated that sustainable issues are currently ranked as a high priority strategy for global companies because the company can improve short and long-term competitive advantages by adopting corporate sustainability. Leaders of the organization need to focus not only on shareholders' interests but also on external stakeholders' concerns because a study showed that

companies that have sustainability practices can sustain better (Van & Greenwood, 2011). The business world will keep investing and developing sustainable practices. Choi and Ng (2011) estimated that companies would spend hundreds of millions of dollars on sustainable development to maintain competitive advantages.

The concept of corporate sustainability started more than 30 years ago. The World Commission on Environment and Development Report defined healthcare sustainability development as meeting the needs of today without compromising the ability of future generations to meet their needs (Burton, 1987). Klöpffer and Ciroth (2011) further supported Burton's definition of sustainability in their study. Sustainable healthcare is to provide high-quality health services to the customer in a benefit of social, financial, and environmental considerations, and without exhausting natural resources or causing severe ecological damage. Sustainable healthcare initiatives involve greening the energy consumption, water consumption, waste management, transportation, and building facilities to ensure resources are efficiently and responsibly used (McGain & Naylor, 2014). Thompson et al. (2013) identified a similar viewpoint on sustainable healthcare in their book; a healthcare institution should provide the best quality of care, promote healthy living, and avoid harming the environment. Wilkinson (2013) declared that sustainability is about harmony with the environment and different industries. In contrast, Li (2011) argued that sustainability is related to a strategic management method to ensure change and uncertainty, and Tregida, Kearins, and Milne (2013) suggested that sustainability in businesses focuses on addressing organizational self-sufficiency and autonomy instead of stakeholders' interests. However, Montiel and Delgado-Ceballos

(2014) argued, after reviewing 16 scholarly works, that no one single standard definition for corporate sustainability exists.

Although there are plenty of studies suggesting the benefits of implementing sustainability measures for a company to adopt a successful corporate sustainability, the company will need a conceptual framework to follow for developing, implementing, and controlling sustainable practices (Baumgartner, 2014). Elkington (1997) suggested a triple bottom line (TBL) sustainability framework that attracted scholars' attention and investigations in the last two decades. The TBL focuses on the organization's efforts in three areas, namely, people, the environment, and finances, to achieve sustainability for an organization. The benefits must be mutually beneficial to all, rather than exclusive. The balance between economic progress, social responsibility, and environmental protection can lead to a competitive advantage.

The TBL framework also provides a performance assessment standard for the management to measure their efforts regarding people and environmental, social, and financial aspects (Schneider & Meins, 2012). Researchers have been conducting studies on corporate sustainability adhering to the TBL framework, which focus on the scope of environmental sustainability, financial sustainability, and social sustainability in the last two decades. However, it is not common to find research studies on TBL in healthcare.

For the healthcare service industry, Mohrman and Shani (2012) suggested that a healthcare organization should focus on TBL to achieve sustainability and improve service quality. The study on sustainable healthcare started in the 1980s (Jamaludin, Habidin, Shazali, Alil, & Khaidir, 2013) and there are various definitions of sustainable

healthcare. These definitions focus on the mutual benefits of meeting present healthcare service needs, sustaining healthcare institution business, and preserving the environment. One of the largest healthcare organizations in the world, the Nation Health Service (NHS) of Britain, further supported the definition of sustainable healthcare as a health system that addresses needs today without prejudicing our ability to do the same in the future (Sustainable Development Unit, 2013).

Financial Issues of Sustainable Practices in Healthcare Organizations

Companies are adopting corporate sustainability activities to achieve long-term benefits (Chabowski, Mena, & Gonzalez-Padron, 2011). Companies that have implemented sustainability activities including modifying existing products and processing or developing new products and processes can obtain financial benefits (Kurapatskie & Darnall, 2013). One study suggested that a company with high sustainability standards can achieve better financial performance because they have human capital, more reliable supply chains, and are more competitive in the sustainability business by introducing new products and processes. Furthermore, a high sustainability company can also avoid costly controversies with nearby communities (Eccles et al., 2014). A study involving the top 100 sustainable global companies suggested that companies with a higher level of sustainability initiatives have better financial performance in term of sales, return on assets, and profit before taxation (Ameer & Othman, 2012). In addition to solving the environmental problems caused by the heath service providers, becoming sustainable can benefit the healthcare organization’s cost effectiveness aspects.

Healthcare energy costing: Healthcare costs are increasing in the United States (Keehan et al., 2012). Spending on energy accounts for a larger portion of the total hospital costs, and the hospital energy costs rose 56% from $3.89 per square foot in 2003 to $6.07 per square foot in 2008; these costs are predicted to continue to rise in the near term (Li & Yan, 2012; Teke & Timur, 2014). A study and survey carried out by the major developed countries in the world suggested that the energy costs for hospitals are expensive. The U.S Department of Energy estimated that in 2013, the total energy cost spent on U.S. hospitals was more than nine billion dollars a year. Canada encounters the same problem. The NHS estimated that their hospitals are spending more than 750 million Euros on energy cost each year (Naylor & Appleby, 2013). Hospitals in the Asian region are having a similar problem. A survey done by Tong and Fong (2014) showed that the energy cost for Hong Kong public hospitals is reaching 100 million U.S. dollars per year. The price of fossil fuels is on the rise, and the cost of energy is also rising (Thompson et al., 2013).

Financial concerns of energy sustainability in the hospital. Hospital management should seek a sustainable energy efficiency program to improve the cost effectiveness of the hospitals. One study showed that corporate sustainability could improve the financial performance of a company (Ameer & Othman, 2012; Rahim, Jalaludin, & Tajuddin, 2011). Similarly, Charlesworth, Pencheon, and Stern (2011) and Wormer et al. (2013) pointed out that healthcare organizations could save money by implementing sustainable practice. Kaplan et al. (2012) suggested that a sustainable energy program at a hospital could save money and increase cost effectiveness.

Hospitals are one of the most energy-intense types of building (McGain & Naylor, 2014). Naylor and Appleby (2013) further estimate that an energy efficiency plan can cut the energy bill by 20%, and help to save €150 each year in hospitals under the Nation Health Service.. Studies note that hospitals can reinvest the resources saved by implementing a sustainable energy program into other hospital initiatives to improve service (McGain & Naylor, 2014). McGain and Naylor (2014) further argued that sustainable practice in health services will help healthcare leaders to save money, resources, and improve health and suggested that hospitals can use the resources saved in the energy efficiency program to empower staff strength and to purchase advanced equipment for service quality improvement.

Assessment of Hospital Suitability Performance

Implementing sustainability practices in an organization has resource implications including investment in green technologies, educational activities, and administrative input (Papagiannakis, Voudouris, & Lioukas, 2014). To ensure the success of implementing sustainability to improve cost effectiveness, assessments for measuring sustainable practices can serve this purpose. A proper assessment tool is also necessary for the company to formulate improvement plans for corporate sustainability and to avoid strategies that deviate from the corporate direction (Epstein & Buhovac, 2014).

Epstein and Buhovac (2014) suggested six objectives that business leaders should consider in formulating their assessment tool for measuring the success of sustainability. The six objectives for measuring sustainability performance are (a) make strategic objective clear, (b) focus on core cross-functional process, (c) focus on critical success

variables, (d)identify early warning signals for problems ahead, (e) identify critical factors going awry, and (f) link to reward. Epstein and Buhovac (2014) mentioned that an effective assessment should include measuring the input of money and the workforce used to implement sustainability activity, a system used to deliver an output, and sustainable and financial performance. Rahardjo et al. (2013) identified five factors for the management of the success of corporate sustainability practice, and the factors are: (a) the commitment of shareholders to encourage the management engaged in solving social and environment issues, (b) the strength of a humanist paradigm adopted by the management, (c) the ability of management to achieve a higher level sustainability performance, (d) the ability of management to build and run a strong sustainability culture that reflects the principles of sustainability properly, and (e) the ability of management to build a mutually beneficial collaboration with the economic stakeholders. A Thai study on measuring corporate sustainability indicated that management perseverance and resilience are two direct predictors of a firm's ability to perform corporate sustainability in an organization (Kantabutra, 2014).

Sustainability Assessment Tools of the Hospital

Implementing sustainability in a hospital requires additional resource investments. An effective evaluating tool can help the leaders to manage the sustainable activities. Sahamir and Zakaria (2014) suggested that hospitals use a systematic assessment system to measure the success of their sustainability initiatives. Sahamir and Zakaria (2014) compared and contrasted three major green assessments for hospitals: BREEAM (Building Research Establishment's Environmental Assessment Method) used in U.K,

the LEED (The Leadership in Energy and Environmental Design) green building rating system used in U.S, and the GREEN STAR rating system used in Australia. Sahamir and Zakaria (2014) wrote that the healthcare system or hospitals have to select the appropriate assessment according to requirements that can assist the leaders to evaluate the success of the sustainable activities.

Opponents of Corporate Sustainability

Although the majority of researchers on corporate sustainability have suggested that being sustainable can benefit the organization, studies on the opposite positions are available. Researchers have found that sustainable corporate activities can enhance a part of the financial performance (Gupta, 2012). Lanoizelle (2011) stated that corporate sustainability activities do not provide a better financial performance, and sustainability management cannot improve the competitive advantage of a company. Kiron, Kruschwit, Haanaes, and Velken, (2012) demonstrated in their study that implementation of corporate sustainability management does not always contribute to financial success, better collaboration with stakeholders, and cooperation with society. Scholars have shown that the radical change in the management thinking style and the lack of assessment tools for detecting sustainable stages of a company can lead to failure in the identification of business opportunities related to corporate sustainability (Calabrese, Costa, Menichini, Rosati, & Sanfelice, 2013).

Barriers to Sustainable Practice

Implementing change in healthcare is an uneasy task; it involves human, social, and organizational factors that may not lead to successful change. Leaders must

understand the barriers to change to figure out a solution (Kuipers et al., 2014). Barriers to achieving corporate sustainability are suggested to contribute to implementation failure, and the barriers include: (a) lack of consensus at the high management level; (b) costs of sustainability and economic conditions; (c) lack of sustainability standards and appropriate regulations; and (d) misalignment of short-term and long-term strategic goals (Giunipero, Hooker, & Denslow, 2012). Barriers to implementing corporate sustainability can come from three sources individual, cultural, and organizational (Lozano, 2013). Lozano (2013) suggested that the individual level barriers to corporate sustainability include the lack of communication, lack of trust, and job insecurity. The group level barriers include group conflict and group culture, and the organization level barriers include lack of management commitment and strategy. Also, a study identified implementing sustainable practices as requiring additional costs in equipment, facilities, and human resources implications, and the benefits of corporate sustainability may not come in the short term (Papagiannakis et al., 2014).

Beare, Buslovich, and Searcy (2014) pointed out in their study on corporate sustainability reporting that a lack of direction from the government on sustainable corporate practices one of the key barriers to the organization. A New Zealand study showed that the key barriers to sustainability for an organization are a lack of knowledge and unclear return on investment in sustainable technologies (Bond & Perrett, 2012). An Australian study pointed out that the key obstacle for healthcare providers to perform sustainable practices is the lack skill and knowledge training on sustainability in a healthcare setting. Healthcare providers think they are not qualified to carry out

sustainable practice in their daily work and fear conflict and professional ostracism (Dunphy, 2013). Also, a lack of a widely accepted assessment tool and reward system for measuring environmental sustainability in healthcare is another key barrier to implementing sustainable practices in healthcare (Naylor & Appleby, 2013).

Overview of the Healthcare System and Green Hospital Practice in Hong Kong

The Hospital Authority (HA) is a statutory body managing all the public hospitals and institutes in Hong Kong. It is under the governance the Secretary for Food and Health of the Hong Kong Government. The HA has been responsible for managing Hong Kong's public hospital services since December 1991. The HA is funded primarily by a Hong Kong Government subvention, which amounted to 42.5 billion Hong Kong dollars for 2012–2013. It takes care of 90% of primary and secondary health services in Hong Kong. They are accountable to the Hong Kong Special Administrative Region Government through the Secretary for Food and Health, who formulates overall health policies for Hong Kong. According to the HA official website, it currently has a workforce of around 67,000 people and manages 42 hospitals and institutions, 47 specialist outpatient clinics, and 73 general outpatient clinics. They provide a total of 27,440 beds, or about four beds for every 1,000 members of the public (Hospital Authority, 2013).

Green Practice in Hong Kong Public Hospitals

According to the 2014 Certificate of Merit of The Hong Kong Awards for Environmental Excellence (the HKAEE) co-organized by Environmental Campaign Committee alongside the Environmental Protection Department of Hong Kong (The

Hong Kong Awards for Environmental Excellence, 2015), there were six hospitals received the awards in 2014. These six hospitals were awarded the Certificate of Merit from the HKAEE and had a green management committee in each hospital as the sustainable energy program governing structure. There are 42 public hospitals in Hong Kong, and the number of hospitals involved in sustainable energy practice represents 14% of the total public hospitals in Hong Kong. The green activities of those six hospitals included initiatives on water preservation, waste management, and energy saving the program in the carbon reduction program content. The energy saving initiatives for those six hospitals involved in the carbon reduction program used administrative measures and energy saving technologies to reduce energy consumption.

According to the Hong Kong Awards for Environmental Excellence (2015), the local hospitals implemented green technologies as one of the strategies for an energy saving program and used administrative measures as well to reduce energy consumption. The energy saving technologies included (a) use of a heat pump system to replace diesel boilers, (b) use of solar energy, (c) lighting retrofitting, (d) overall thermal transfer value enhancement, (e) installation of energy savers on window type air conditioners, (f) introduced equipment retrofitted for LED exit sign lighting system and lift lighting, (g) use of electric vehicle for outreach service, and (h) introduction of cook-chilled patient food system (Nguyen & Aiello, 2013; Todorovic & Kim, 2014). The local hospitals also included energy saving administrative measures for energy saving activities including promotion and education approaches, and the establishment of guidelines and policies (Zuo & Zhao, 2014).

Energy measures in Hong Kong hospitals. Hospitals use 1-3% of the operation budget in energy expenditure and is a significant contributor to greenhouse gas emissions and carbon dioxide emissions (Kaplan et al., 2012). Hospital leaders may consider implementing energy efficiency measures to reduce energy cost (Teke & Timur, 2014). Energy saving measures that can help hospitals to save energy expenditures include adjusting and installing a variable speed drive into the heating, cooling, and lighting system in unoccupied areas, purchasing more energy-efficient equipment and a renewable energy system, and adjusting the ventilation system (Gago, Muneer, Knez, & Köster, 2015; Saidur, Mekhilef, Ali, Safari, & Mohammed, 2012). A recent study by Peterman, Kourula, and Levitt (2012) developed a conceptual framework called *Strategic Drivers for Energy Efficiency Program Implementation* for commercial building energy efficiency management. The energy efficiency conceptual frameworks describe five major strategic drivers and how these drivers can assist the company, staff, and manager to accomplish energy efficiency in a commercial building. The five major drivers are energy policy, economic incentives, certifications, alliances and partnerships, and internal company programs; hospital leaders may consider using this conceptual framework to introduce an energy saving program in the hospital.

Transition and Summary

The objective of this qualitative study with a multiple case study design was to explore the strategy for employing a sustainable energy program in public hospitals in Hong Kong to effectively reduce energy consumption. The background information in Section 1 contained a foundation of knowledge about the current situation and

consequences of corporate sustainability in both commercial and healthcare settings. Furthermore, Section 1 also contained theories, conceptual frameworks, and strategies that facilitate the Hong Kong hospital leaders to develop and implement corporate sustainability. Hong Kong hospital leaders realize the urgency and importance to incorporate sustainable practice in their hospitals to reduce energy costs and improve cost effectiveness. Also, the readers can obtain useful information on the barriers and opponents to corporate sustainability, which they can find helpful in planning sustainable activities in their organizations.

Section 2 includes the purpose of the project; I discuss my role as the researcher, the details of the participants, research methods, and research design of this study. Section 2 also includes a discussion on data collection and the analysis approach and the work to ensure reliability and validity of this research study. To conclude, I discuss the results and conclusion in Section 3.

Section 2: The Project

The increasing healthcare financial burden is one of the major driving forces for healthcare institutions to apply sustainable measures. Studies indicate that hospitals can obtain both long-term and short-term financial benefits by introducing sustainable measures in their hospitals (Keehan et al., 2012). Applying a sustainable energy program in the hospital is a promising approach to reduce operating costs, and leaders of the hospitals can reallocate the resources for other service enhancement initiatives. A hospital's sustainable policy, strategy, and leadership are the key elements for hospital leaders to successfully implement sustainable measures (Berwick & Hackbarth, 2012). The majority of Hong Kong hospitals do not have a robust sustainable energy program in place, yet six local public hospitals have introduced sustainable activities with recognizable achievements (Hospital Authority, 2013). This section elaborates on the purpose of this study, the role of the researcher, a description of the participants, the research method, description of population and sampling, data collection, data analysis, reliability, and validity.

Purpose Statement

The purpose of this qualitative, multiple case study was to explore the strategies necessary to develop and implement an effective sustainable energy program in Hong Kong public hospitals. The participants of this study were the hospital green committee chairpersons from five public hospitals in Hong Kong that received outstanding achievement recognition from the local government. A hospital is one of the most energy-intensive facilities; implementing a sustainable energy program will help to

reduce pollution and energy costs (McGain & Naylor, 2014; Qadir et al., 2014). The implications for positive social change include providing findings as a reference for hospital leaders to redirect the saved resources from a sustainable energy program to improve patient care and reduce pollution (McGain & Naylor, 2014). Also, the reduction of pollution and greenhouse gas emissions from the hospitals will reduce the incidence of human disease, and it will further improve the financial burden of public hospital services (Kaplan et al., 2012).

Role of Researcher

A researcher of qualitative research with a multiple case study design collects, organizes, and analyzes, categorizes, and interprets primary data from face-to-face semistructured interviews with questions (Doz, 2011). I conducted a face-to-face semistructured interview with five chairpersons of the hospital green committees to explore the strategies needed to develop and implement a sustainable energy program in the hospital to reduce energy cost. The interaction between the researcher and participants and the analysis of the qualitative data can lead to an understanding of the research question of this study and can provide foundational information for future research (Doz, 2011; Shaw, 2013). A researcher in a study needs to determine which research approach can answer the research questions, to make good decisions to produce evidence of the highest possible quality, and learn about the actual behavior, attitudes, or real motives of the people (Vaismoradi, Turunen, & Bondas, 2013).

According to the Belmont Report (2014) by the U.S. Department of Health and Human Services, my role as the researcher in this study is part of the ethical aspect to

ensure the participants are respected as autonomous agents.Also, I made sure that the study would not cause any harm to the participants, and ensured a maximum of possible benefits and a minimum of possible harms to them. I also needed to ensure that the participants would receive equal treatment throughout the study. The participants signed an informed consent that contains the details of the risks of the study; they participated on a volunteer basis.

I established an interview protocol to ensure the reliability of the study and to guide the data collection process to reduce bias from my personal point of view (Yin, 2014). The interview protocol contained four sections including (a) overview of the case study, (b) data collection procedures, (c) data collection questions, and (d) guide for the case study report documented in Appendix B. Yin (2014) suggests that a researcher can use observations, document reviews, and member checking to enhance the credibility of the study alone with interviews (Lewis, 2015). I returned the final interview summary to the participants for their review to ensure that my interpretations reflect their experiences and feelings accurately. I did not interview the hospital chairperson or vice chairperson of the green management committee in the hospital where I work to avoid bias in collecting and analyzing data.

As an allied health professional, I have worked in different clinical settings and administration departments of the Hospital Authority, which is the largest health institution in Hong Kong since 2003. In these 11 years of service, I participated in various clinical and management-related projects at functional, business, and corporate levels. I chose to study healthcare sustainability because the majority of the public

hospitals in Hong Kong do not have a sustainable program to control energy consumption. There are various benefits for an organization to practice sustainability including lower operation costs, improved branding, and reduced staff attrition (Epstein & Buhovac, 2014). Local hospitals should allocate efforts for sustainability to improve the competitive advantages by reducing energy costs and improve service quality.

Participants

I conducted my study by selecting the participants from major local hospitals who have implemented a sustainable program; this was because a researcher may conduct a qualitative study using a single unit with multiple participants within the same setting (Yin, 2014). Lewis (2015) pointed out that a researcher in a qualitative study should select participants that have thorough knowledge of the phenomena for the study question. Elo (2014) also suggests that researchers select a participant composition that can best represent the expertise in the research topic to enhance study reliability. In general, the participants of this study were the chairpersons of the green management committees currently working in public hospitals located in Hong Kong. It is assumed that they have the best knowledge and experiences in developing and implementing sustainable measures at their hospitals.

Dworkin (2012) suggested that five to 50 samples are appropriate for a qualitative study. Six Hong Kong public hospitals received awards from the Hong Kong government on energy saving, but one of the hospital green committee chairpersons resigned from the position; therefore, I only interviewed the chairpersons of the five green management committees who had already implemented a sustainable energy program at their hospitals

and received an award and recognition from the government. This group of people has the best knowledge and experience on how to implement a sustainable energy program in the hospital. I used a semistructured questionnaire to collect the data for analysis because a semistructured questionnaire is an effective way to collect qualitative data in the case study design (Yin, 2014).

Gaining access is an important part of doing a qualitative research interview because the quality of access affects what information is available to the researcher (Doody & Noonan, 2013). After obtaining consent from the study participants, I sent them an invitation via electronic mail and arranged the semistructured face-to-face interviews at the participants' convenience. Follow-up phone calls to the participants were made to explain the interview purpose; the process is a close communication approach with the participants, which can facilitate a successful interview (Kondowe & Booyens, 2014).

Consent is crucial in gaining access to the participants by informing them of the purpose of the study and the participants' rights; this will help to establish rapport with participants and will provide study access and yield valid data (Lewis, 2015). I provided the consent form, informing the participants of the intentions and scope of this study. The participants confirmed their voluntary participation in this study. The consent form identified the right of the participants to opt out of the study at any time for any reason. The participants replied to my electronic mail with the word, "I consent," agreeing to participate in the study voluntarily and accepting an audio recording of the interview. I informed the participants of the coding design of responses to protect their identity and

the study design to store responses for 5 years after the completion of this study (Searle & Hanrahan, 2011). I stored the collected data in locked storage, and will keep the data for 5 years after I publish my study.

A successful qualitative study requires a good working relationship with the participants (Swauger, 2011). The participants of this study were the chairpersons of the green management committee at the largest local health organization. Although I worked in the organization for 11 years, there are 42 hospitals in the health organization, and the size of the organization will not allow me to establish the working relationship between the participants with me in this study. For this reason, I used the following strategies to motivate them to participate in my study. I interviewed the chairpersons of the green management committee who had successfully implemented sustainable practices in their hospitals and collected their strategies and views of their achievements to avoid rejections of my invitation. Building rapport and frequent communication with the participants can help to maintain a good working relationship (Kondowe & Booyens, 2014). I made a phone call to the participants before sending the invitation and consent form via electronic mail, and before visiting them to conduct the interview because a well-prepared researcher is more likely to be engaged, listen attentively, and respond appropriately in the interview (Doody & Noonan, 2013). I also acknowledged them for their contributions to my study to motivate them to join my study.

The five participants were the chairpersons of the hospital green management committee, who have made achievements in leading the hospital to develop and implement a sustainable energy program. The participants were the best people to

interview, with the knowledge of and experience with the factors necessary to develop and implement a sustainable energy plan to reduce operating costs (Searle & Hanrahan, 2011). Also, according to the Hospital Annual Report 2013, these five hospitals, of the 42 hospitals in Hong Kong, had introduced sustainable energy measures, which further strengthen their targeted role as participants in my study (Hospital Annual Report, 2013).

Research Method and Design

I used a qualitative research method and multiple case study design to explore the strategies necessary for Hong Kong hospital leaders to develop and implement a sustainable energy program to reduce energy costs and to increase cost effectiveness. Qualitative research is a method that the researcher uses to gather an in-depth understanding of a specific human behavior in a group or organization, and in social and political areas (Hyett at al., 2014). The research method is a procedure the researcher uses to obtain and evaluate data, and to provide additional knowledge to the current research (Petty, Thomson, & Stew, 2012). After reviewing all of the common research methods including qualitative, mixed method, and qualitative method, I decided to choose the qualitative method because it can help answer my research question.

Method

By conducting the qualitative study, the researcher will understand why and how a behavior works in a particular setting, and will usually involve a small group of samples for collecting data (Lewis, 2015). A researcher can use the qualitative method to provide an explanation and analysis of results of the data by investigating the patterns and themes of the data, whereas quantitative research investigates the observed phenomena by

statistical or computational techniques (Yin, 2014). I used qualitative study method in this study to investigate the business elements that require for the local public hospitals to develop and implement a sustainable energy program by analyzing the data from the semistructured interviews and the document reviews.

There are three research methods, namely, quantitative, mixed method, and qualitative. Quantitative research is a method to predict and describe the observed phenomena, and the researchers use statistical analysis tools to understand the observed behavior, whereas qualitative study researchers will use interviews, observations, document reviews, and a focus group to collect data for analysis (Lewis, 2015). A mixed method, however, is an approach for researchers to understand the phenomena by combining both qualitative and quantitative methods to analyze data, and it is suitable for researchers to use results from one study to support the other study (Klassen et al., 2012). However, a qualitative study approach is more appropriate for studying social and cultural phenomenon such as specific business behaviors (Doz, 2011). Therefore, I used the qualitative research method in this study because I can understand the phenomena for my research question by describing, decoding, translating, and understanding the data (Sergi & Hallin, 2011). I used the qualitative research method to understand the behavior of the healthcare leaders in responding to sustainable practice in the hospitals.

Design

There are three major methods in qualitative study designs, namely, an ethnography study, case study, and phenomenological study (Wisdom, Cavaleri, Onwuegbuzie, & Green, 2012). A qualitative case study research design is an approach to

understanding a particular phenomenon within its context using a variety of data sources, and the researcher can use the case study approach to obtain an in-depth appreciation of an issue, event, or phenomenon of interest, in a real-life context (Crowe et al., 2011). There are other types of design research methods in the qualitative study including phenomenology and ethnography. The phenomenological design is a method to explore and understand the participants' living experience that may not apply to the research question about the strategies for Hong Kong hospital leaders to develop and implement a sustainable energy program to reduce energy cost (Ardley, 2011). The ethnographic design is not suitable for this study because the ethnographic design is an approach to explore the relationship between the participants' culture and the behavior (Christiansen, 2011; Nite & Singer, 2012).

There are a variety of methods of data collection in qualitative research, including interviews, observations, document reviews, and focus groups to collect data for analysis (Lewis, 2015). I conducted a semistructured interview with the chairpersons of the green management committee of five hospitals with outstanding achievements to learn the factors required for other hospitals to develop and implement a sustainable energy program to reduce energy costs. Also I used the document review to understand further the details of the sustainable energy program in their hospitals. The case study approach can offer additional insights into the gaps in current hospital strategies on sustainable practice and why other Hong Kong hospital leaders do not have a sustainable energy program in their hospitals (Crowe et al., 2011).

Yin (2014) suggested that researchers use a case study design when they are looking to answer how and why questions, and when researchers cannot manipulate the behavior of those involved in the study. Also, researchers can use a case study design to learn the contextual conditions because they believe that they are relevant to the phenomenon under study. Finally, Yin (2014) pointed out that the researcher should use a case study design when they do not know the boundaries of the phenomenon and the context is not clear. As a researcher, I did not have the power to manipulate the decisions of the healthcare leaders to adopt sustainable energy practices at their hospitals. I used the qualitative case study research design to understand why the local healthcare leaders developed and implemented a sustainable energy program in their hospitals, or why they do not do so, and how the leaders incorporate a sustainable energy program to obtain cost effectiveness by reducing energy costs.

Data saturation is a tool used for ensuring that adequate and quality data are collected to support the study (Walker, 2012). Unless reaching data saturation, researchers must continue to collect data until no new information or patterns exist to ensure quality and the content validity of the study (O'Reilly & Parker, 2012). Data saturation means that there is enough information to replicate the study (O'Reilly & Parker, 2012; Walker, 2012). Dibley (2011) suggested that the researcher may need to collect data in both good qualitative and quantitative perspectives to reach data saturation. The researcher can take many interviews to reach data saturation and interview of people that one would not normally consider avoiding overshadowing the data (Walker, 2012).

I conducted a semistructured interview with most of the potential participants because one of the chairpersons in the target group resigned from the position. The five chairpersons of the hospital green committee of local hospitals had received recognition from the government for their achievement in energy preservation. By including all potential targeted participants, I could enhance the data saturation for my study.

A focus group interview is another way to elicit multiple perspectives on a given topic, and the application of triangulation will enhance the reliability of results and move to data saturation (Walker, 2012). However, due to the workforce limitation and participants' accessibility constraint for the public hospital, I did not conduct a focus group for this study.

Population and Sampling

There are 42 public hospitals in Hong Kong serving more than 90% of the population. Among these 42 public hospitals, I selected six of them as the targeted experimental sites because they have implemented a sustainable energy program and received the 2014 Certificate of Merit of the Hong Kong Awards for Environmental Excellence (the HKAEE) co organized by the Environmental Campaign Committee alongside the Environmental Protection Department of Hong Kong (The Hong Kong Awards for Environmental Excellence, 2015). However, since one of the targeted participants resigned from the position, and did not reply my electronic mail invitation, I conducted only five interviews with the targeted participants. These five hospitals were awarded the Certificate of Merit from the HKAEE and had a green management committee in each hospital as the sustainable energy program governing structure. The

five hospitals include both acute and convalescence settings and are under the Hospital Authority. The awarded hospitals are (a) Castle Peak Hospital, (b) Haven of Hope Hospital, (c) Pamela Youde Nethersole Eastern Hospital, (d) Pok Oi Hospital, and (e) Princess Margaret Hospital. The chairpersons of the five hospital green management committees were my targeted participants for the interviews.

The research question of this study was to explore the strategies for local hospital leaders to develop and implement a sustainable program to reduce energy costs. I conducted a semistructured interview with the chairpersons of the green hospital committee who led the hospital to the successful implementation of the sustainable energy program; they would have the best information and knowledge to respond to my interview questions. Also, these five leaders of the green management committees demonstrated outstanding achievements among other Hong Kong public hospitals and received recognition from the government body of energy conservation, and should have valuable experiences to fortify my data for analysis.

I used the purposive sampling method in my study on what strategies contribute to the Hong Kong hospital leaders' development and implementation of a sustainable energy program to reduce energy costs. Research can use purposive sampling and starts with a specific purpose in mind and selects the targeted participants (Walker, 2012). Ando, Cousins, and Young (2014) suggest a sample size of 12 participants as a viable sample size for reaching saturation. Suri (2011) suggested that a researcher use a purposive sampling method to access the targeted participants who have the key knowledge and information on the research topic.

To achieve data saturation, I conducted five semistructured interviews with the chairpersons of the outstanding hospital green management committees who received the Certificate of Merit by the HKAEE in 2014. Purposeful sampling is one of the most common sampling methods and is appropriate for a case study design, and the number of participants for a study to reach saturation could range from five to 50 (Dworkin, 2012). For the interview setting, Scheibe, Reichelt, Bellmann, and Kirch, (2015) suggest that the interview area be in a relaxed atmosphere to facilitate participants to respond freely and ask a question. I conducted the semistructured interview with my participants in a private meeting room that could maximize their chances to ask questions and respond to my interview questions.

Ethical Research

The procedures of this study followed the ethical requirements of Walden University. I received the approval of Walden University Institutional Review Board with the number 09-29-16-0460679 and then I conducted the data collection procedures. All participants in this study signed a consent form and were volunteers with no involvement of any form of coercion or other unethical practice. According to the consent form, all participants understood the background and the nature of the study, intention of the study, the use of data collected, risk and benefits of the study, clarification of no incentive statement for this study, and the terms and right to discontinue participation at any time with no responsibility or adverse effects. I sent the consent form to all participants one week before the interview date and conducted the interview only if I received a reply with the consent form from the participant. Also, the consent contained information on

how I would handle the data with privacy and a confidentiality approach to protect the participants.

To protect the rights and confidentiality of the participants, I have kept their information anonymous in this study. I will keep all of the participants' information and data collected in locked and safe storage for 5 years after the publication of this study, and then I will destroy the data and participants' information after the 5 years period.

Data Collection Instruments

As the researcher of this study, I participated as one of the data collection instruments. Semistructured interviews and a company document review are the types of collection instruments that can define the areas of interest by obtaining detailed information from participants on the views, experiences, beliefs, and motivations on a specific topic (Peters & Halcomb, 2015). I conducted a semistructured interview with five chairpersons of the hospital green committees and also performed a document review to collect data for the analysis process. The semistructured interview is flexible, accessible, and intelligible, and capable of disclosing important and hidden facets of the specific topic of interest (Qu & Dumay, 2011). A semistructured interview is one of the most common qualitative research data collection methods, but the researcher should have the right interview skills to collect valid data. The interview skills include probes or prompts to encourage elaboration or explanations, the use of comprehensible language that is relevant to the interviewees, and starts with easy questions then moves to difficult questions (Doody & Noonan, 2013).

Yin (2014) suggested that a documentation review is relevant to most case study research because it can provide a wide range of information on the topic of interest, and which is related to the participants or organization. Researchers can review official documents including reports, publications, information on the official website, and others that are related to the document review process in the qualitative research (Lewis, 2015). I reviewed the official publications of the hospital green committees on the governance and organization structure, the terms of reference, green initiatives, reports, and related publications or documents that are available on the hospital official website for review.

After I received the Walden University IRB approval with the approval number 09-29-16-0460679 and the signed consent from the participants, I started interviewing my participants. Semistructured questionnaires, as the major data collection tool, consisted of nine questions regarding the topic of corporate sustainability and healthcare sustainability according to the conceptual frameworks stated in the literature review section of this study. I arranged face-to-face interviews with my participants at their convenience, and each interview lasted 30 minutes. I used interview techniques to ensure the quality of the data collected, and the techniques included note taking, careful planning, intensive listening, and scheduled and unscheduled probes (Qu & Dumay, 2011).

To ensure study reliability and validity, I used data triangulation to enhance the internal validity and member checking to enhance the reliability of my study (Crowe et al., 2011; Thomas & Magilvy, 2011). Semistructured interviews and documentation reviews are the major data collection methods used in this study, and a triangulation approach to ensure internal validity (Chen, Hailey, Wang, & Yu, 2014). Member

checking is a technique that researchers can use to help improve the accuracy, credibility, validity, and transferability in qualitative research (Morse, 2015; Thomas & Magilvy, 2011). I shared the findings of my study with the participants to ensure that the information is accurate and reflects participants' experience and feelings to enhance the study reliability.

Data Collection Technique

I used a semistructured interview with nine questions and a documentation review to collect the data for exploring the strategies necessary for Hong Kong hospitals leaders to develop and implement a sustainable energy plan to reduce energy costs. After I had received approval from the Walden University IRB with the approval number 09-29-16-0460679 and the consent from the participants, I sent them an email invitation to arrange the interview at a convenient time and location.

The interview location was a private conference room to avoid distractions and to protect participants' privacy. The participants received a copy of the interview protocol (Appendix A) that contains information on the duration and procedures of the interview. To prepare for the interview, I arrived at the interview venue 10 minutes before the scheduled time. The interviews lasted for 30 minutes, and I informed the participants that I would take notes and record the interview data during the entire session. The participants had the right to refuse to answer my interview questions at any time for any reason.

Documents of the subject hospitals were available for review on the official websites of these hospitals. Documents including green committee governance and

organizational structure, the terms of reference, green initiatives, and reports were available on the hospitals' official websites for review.

I used interview to collect the data from the participants of this study. An interview is a useful technique to collect qualitative data to understand the topic of interest at an in-depth level, but poor preparation and inadequate interview skills may end up with disappointing results of the data collected (Qu & Dumay, 2011). Another benefit of using the interview to collect data is that an interview has the potential to generate a range of insights and understandings that might be useful (Rowley, 2012; Doody & Noonan, 2013). However, one of the limitations of conducting an interview in a qualitative study is that it cannot study a very large or random sample of people, due to the large amount of time and effort involved (Qu & Dumay, 2011).

I did not conduct a pilot study after I received IRB approval from Walden University for two reasons. First, there are only six targeted hospitals involved in this study and they might not provide extra qualified participants for an interview. Second, the process of conducting a pilot study in the Hospital Authority would require a separate application to the ethics committee that may affect the chance of getting approval for my interviews with the six targeted participants.

To ensure data reliability, I used member checking after I collected all the data from the five participants. Member checking is a technique to ensure the reliability of the interview data (Crowe et al., 2011; Thomas & Magilvy, 2011). The participants received my organized data and findings to make sure I had a good understanding of their answers and to confirm the validity of the details I collected.

Data Organization Technique

I conducted five semistructured interviews with nine questions and review documents related to green activities of the targeted hospitals to collect data for analysis and to explore the strategies for Hong Kong hospitals leaders to develop and implement a sustainable energy program to cut energy costs to improve cost effectiveness.

Data organization after the interview is important for the trustworthiness of the study; also, a software program that can integrate information across many different functions and purposes can help to manage data for further analysis (White, Oelke, & Friesen, 2012). NVivo is a computer software for qualitative data analysis. I used NVivo 10 to code, organize, and store the qualitative data collected from the interview and information and details of all participants. NVivo 10 is also a data management software that can assist in data management for further analysis, and it can manage a large amount of qualitative data. White, Oelke, and Friesen, (2012) used the former version of NVivo 10 to organize, code, and analyze qualitative data from 167 interviews in their nursing study. I used NVivo to analyze the data and came up with findings from the pattern of the intevew for result resentation purpose.

Also, I used Microsoft Word to record all other interview details including data, time, location, and participant's information in a coding system with a case number to identify the participant. A coding system can protect the confidentiality of the participants (Searle & Hanrahan, 2011). I categorized all documents and artifacts of the participants' information, transcript, consent form, and audio interview recording, and stored them in safely-locked storage for 5 years.

Data Analysis Technique

I conducted a semistructured face-to-face interview with five chairpersons of the hospital green committees to collect the data to answer the research question on the strategies required for hospital leaders to develop and implement a sustainable energy plan to improve cost effectiveness. Document review can strengthen the data triangulation of the case study research in addition to data collected from the interviews (Walshe, 2011). Therefore, I reviewed relevant documentation of the hospital green initiatives on each of the five hospital official websites.

After the data collection procedure from semistructured interviews and document reviews, I used the qualitative data analysis software NVivo 10 for data management. The data management process includes data input, storage, coding, figuring out patterns, and creating themes using the NVivo 10 software. The advantages of using NVivo 10 for data management and analysis include a better alignment of original data to the categories and themes in the data, and increased rigor in qualitative research (Leech & Onwuegbuzie, 2011; Smith & Firth, 2011).

For the qualitative data analysis approach, I used a framework approach to explore the research question of my study. Smith and Firth (2011) note that a framework approach can assist the researcher to apply systematically the principles of undertaking qualitative analysis to a series of interconnected stages that guide the data analysis for qualitative research. The framework approach is suitable to analyze cross-sectional descriptive data collected from the interview and document review. The researcher can use the framework approach to enable different aspects of the phenomena under

investigation to be captured, increase the transparency of the researcher's interpretation of the participants' experiences, strengthen the rigor of the research process, and enhance the validity of the findings. I used the CSM developed by Epstein (2008) as the major conceptual framework for this study. The CSM consists of four major parts of 12 driving factors that provide a systematic approach to understanding and applying sustainability in an organization (Epstein, 2008). I developed my interview questions according to the CSM and I analyzed my data collected from interview and document review to explore the strategies required for Hong Kong hospital leaders to develop and implement sustainable energy plan in their hospital based on each driving factors described in the CSM (see Figure 1).

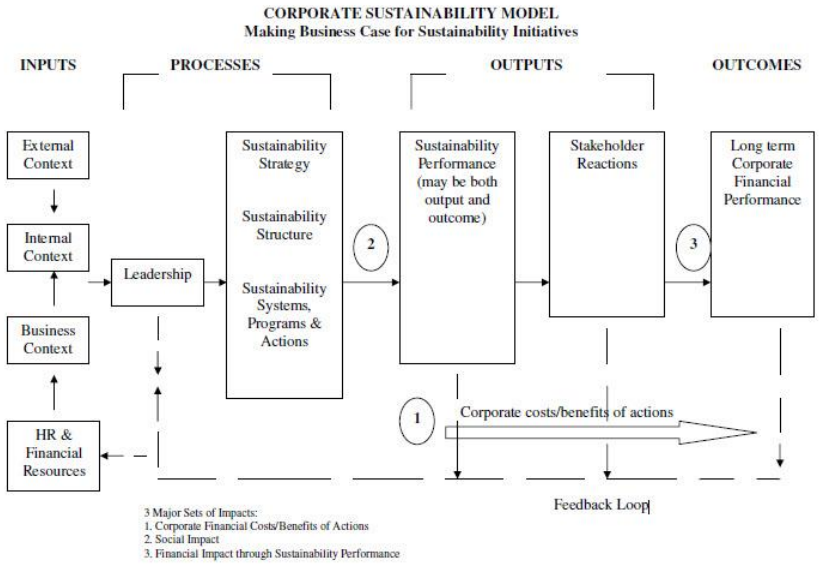

Figure 1. Corporate Sustainability Model developed by Epstein (2008).

For the data analysis process, I used the five phases qualitative data analysis process suggested by Yin (2014) (a) compiling, (b) disassembling, (c) reassembling, (d) interpreting, and (e) concluding. In the compiling process, I categorized and sorted the

data of this study and labeled the data into specific words, phrases, and sentences. The second step was to separate the data into a meaningful grouping. The disassembling of data includes assigning a code to each element in the literature review and conceptual framework used in this study.

The reassembling process consists of linking the coded materials to identify any specific pattern and theme in the data by using the computer software NVivo 10. I then interpreted the patterns and themes identified from the reassembling step, according to the CSM driving forces, to highlight and explain the findings on how to address my research question about strategies that could help the Hong Kong hospital leaders to develop and implement a sustainable energy plan in their hospitals to reduce costs. The computer software NVivo 10 provided the theme and patterns according to the raw data collected in the qualitative data collection procedure (Woods, Paulus, Atkins, & Macklin, 2015). The last step in the analysis process was the conclusion. The researcher draws conclusions according to the findings identified in the whole data analysis process, and explains how the findings can help the readers to understand the research question (Elo et al., 2014).

Reliability and Validity

The rigor of method, transparency on the analytical procedures, reliability on the data collected, and researcher bias are the most controversial parts of the qualitative research (Noble & Smith, 2015). Reliability is the extent to which another researcher can repeat the study method at any time, at any place with any other conditions or instruments, and they should obtain the same findings (Drost, 2011).

Dependability is refereeing to the extent that another researcher can repeat the study when following my study protocol, and the strategies to enhance dependability include having peers participate in the analysis process, and provide a detailed description of the research methods (Thomas & Magilvy, 2011). I invited peers to review my study protocol and make sure another researcher could repeat the study without showing the participants' information. Another method to increase the dependability is to establish a detailed guideline of the research method describing the step by step approach to the procedure of my study.

I used member checking to increase the credibility of this qualitative study on how Hong Kong hospitals can develop and implement a sustainable energy program to improve cost effectiveness. I conducted interviews with five hospitals green committee chairpersons to obtain the data; participants received the findings and data for their review and to check to ensure that the content truly reflects their experiences and feelings (Thomas & Magilvy, 2011).

Triangulation is a tool to enhance credibility of qualitative and it is referred to increase the trustworthiness of the data collected in a qualitative study by including multiple resources (Houghton, Casey, Shaw, & Murphy, 2012). In this study on exploring the strategies necessary for Hong Kong hospitals leaders to develop and implement a sustainable energy program to reduce costs, I used semistructured interviews consisting of nine questions related to the conceptual framework of this study.

Transferability is the ability to transfer research findings or methods from one group to another (Houghton et al., 2012; Thomas & Magilvy, 2011). Strategies to

enhance the transferability of a qualitative study include a detailed description of the accounts of the context, the research methods, examples of raw data, population and sampling, demographics and geographic boundaries of the study for readers to interpret (Houghton et al., 2012; Thomas & Magilvy, 2011). To enhance the transferability of my study, I included a detailed description of the relevant information in the introduction, research method and design, sampling, data organization, collection, and data analysis technique of my dissertation (Houghton et al., 2012). For the raw data examples, I inserted the raw data in Appendix B without identifying the participants' details to increase further the transferability of the study.

Confirmability refers to the researcher's ability to demonstrate that the data represent the participants' responses and not the researcher's biases or viewpoints (Cope, 2014). I included the quotes from my participants in Appendix B without the participants' identification or details. Including quotes from the participants is a technique to enhance study confirmability because readers can understand that the conclusion and discussion of the findings are derived from the raw data collected from the participants (Cope, 2014).

Saturation is a tool used for ensuring that adequate and quality data are collected to support the study and to ensure that the researchers reach data saturation by collecting enough information to replicate the study (O'Reilly & Parker, 2012; Walker, 2012). I tried to include all of the potential targeted participants in my interview who have the expertise and real life experience on how to develop and implement a sustainable energy program to improve cost effectiveness, because increasing the number of participants can help the researcher to reach data saturation (Walker, 2012). However, one target

participant did not join my interview because he resigned from his position. Also, I conducted a document review for the targeted hospitals and ensured there were no additional findings or data available for exploring my research question to enhance the data saturation of the study.

Transition and Summary

Section 2 of this proposal includes the criteria for selecting the participants and the details of the research method and design. I included the supporting documents for sampling method and the ethical consideration for data collection process in the section. This section contains the details of data collection instruments, organization techniques, and analysis strategies. Finally, I present the strategies to enhance the study reliability and validity in the last part of this section. Section 3 of this study will explain the findings, implications for social change, recommendation for action, recommendations for further research, reflections, and the conclusion of my study.

Section 3: Application to Professional Practice and Implication for Change

The problem was that the majority of the hospital leaders in Hong Kong did not implement a sustainable energy program in their hospitals, which induced high energy consumption costs. I used the research questions of this study to collect qualitative data through semistructured interviews with the hospital green committee chairpersons who had successfully implemented a robust sustainable energy program and received recognition from the local government. I also used a document review to collect relevant information from the subject hospitals' official websites for increasing the reliability of the data quality.

This section of the study contains the results of the interviews with the conclus the participants who had the best knowledge and experience on developing and implementing a sustainable energy in Hong Kong public hospitals and from the hospital document review for data analysis. This section includes an evaluation of the interview results about the research question. The end of this section contains a conclusion and a recommendation for future study.

Overview of the Study

The purpose of this qualitative multiple sites case study was to explore the strategies required for Hong Kong hospital leaders to develop and implement a sustainable energy plan to save energy costs. Six public hospitals received the Hong Kong Awards for Environmental Excellence in 2014; I planned to invite all six chairpersons to my semistructured interviews to achieve data saturation. However, one of the chairpersons resigned from his previous position and the participant did not reply to

my invitation and was not involved in my interviews. Dworkin (2012) suggests that five to 50 samples are appropriate for a qualitative study; five chairpersons from the hospital green committee participated in my interviews, and I collected and analyzed the data to create the themes of this study. The data came from five semistructured interviews with the chairpersons and a document review of the five public hospitals' green management committee, and the study results showed the strategies that the hospital green committee chairpersons used to successfully develop and implement a sustainable energy program at their hospitals.

The study findings revealed that to successfully develop and implement a sustainable energy program in a public hospital, the external and internal driving forces are crucial factors. The external driving force is the sustainability policy of the local government, and the internal force includes corporate and hospital green initiatives. Having a skillful leader is also an important strategy to mobilize staff to comply with and participate in the sustainable energy program. Findings of this study indicate that strong leadership skills such as communication skills, influencing tactics, stakeholder engagement, and a people-centered approach are essential for a hospital leader to implement a sustainable energy program at a local hospital. Governance and top management commitment contributed as strong drivers to the implementation and execution of a sustainable energy program in the hospital. The study findings also suggested that a sustainable culture could be very helpful to facilitate staff to practice in a sustainable manner. Capacity-building and knowledge-building are important to enhance and maintain the sustainability culture in the local public hospital. Finally, performance

measures including meeting the key performance indicator, achieving the targeted saving unit, and receiving awards from nongovernment organizations are effective strategies and motivators for the hospital to implement the sustainable energy program and evaluate its effectiveness.

Presentation of the Findings

The research question of this study was: What are the strategies for hospital leaders to develop and implement a sustainable energy program to reduce energy costs? Data sources included semistructured interviews with the hospital green committee chairpersons and a document review of the five public hospitals that had received the Hong Kong Awards for Environmental Excellence 2014. The five chairpersons of the green committees were the hospital general manager that led the hospital to develop and implement the sustainable energy program. All of the participants must have had more than 10 years management and administration experience to be the hospital general manager, according to the employment requirement of the Hong Kong Hospital Authority. The subject hospitals included acute and convalescent settings, and the size of the hospital ranged from 300 to 1,800 beds. Participants received a draft of the interview summary for members' checking purpose, and I reached data saturation after the fourth interview with the participants.

Several themes emerged from the data analysis process. The leader of an organization should introduce corporate sustainability measures to enhance an organization's competitive edge and to sustain it in both the short and long-term (Bansal & DesJardine, 2014). Several themes emerged from the data analysis procedure across all

participants: (a) external and internal driving forces, (b) leadership, (c) governance, (d) sustainable culture building, and (e) performance measures. According to Boulle (2012), strong corporate sustainability organizations have few important attributes of sustainable measures, including strong awareness, robust policy, and effective investment in sustainable equipment. The findings of this study revealed that all of the participants' hospitals in this study demonstrated a strong level of corporate sustainability. Table 2 shows the themes that emerged and shows that the leaders of Hong Kong nonprofit public hospitals require a multicomponent strategy to effectively lead their hospitals in achieving the sustainable energy initiatives when dealing with cultural and organizational considerations.

Table 2

Frequency of Primary Themes from Data Collected from Semistructured Interviews

Themes	*N*	% of frequency of occurrence
Internal and external driving forces	14	22.22%
Leadership	23	36.5%
Governance	9	14.29%
Building sustainable culture	8	12.7%
Performance measure	9	14.29%

Emergent Theme 1: Internal and External Driving Forces

All five participants pointed out that external and internal driving forces were essential elements to develop and implement a sustainable energy program in their hospitals. The government policies and guidelines on energy conservation and greenhouse gas emissions are the fundamental measures that a public hospital should

follow. Government regulations such as energy saving targets and carbon dioxide reduction provided a clear framework for all subject hospitals to establish a direction and action plan for their energy saving initiatives. Three documents from the subject hospital green committees revealed that government regulation on environmental protection was one of the motives for them to introduce sustainable programs. The findings confirmed the previous studies that government policy is an effective and essential driver to facilitate an organization to implement and outperform in the corporate sustainability measures and activities (Dobbs, Dobbs, van Staden, & van Staden, 2016; Epstein & Buhovac, 2014; Ioannou & Serafeim, 2014). Two of the participants revealed that the recent change in stakeholder awareness and expectations of environmental protection was another external driving force to facilitate their hospitals to implement a sustainable energy program, which provided findings similar to another study on the external drivers on corporate sustainability (Lozano, 2015; Naylor & Appleby, 2013).

The hospital's goal in the sustainable energy direction was an external driving force for the hospitals to develop and implement a sustainable energy program. The Hong Kong Hospital Authority, a statutory body providing public hospitals and related services to the citizens of Hong Kong, governs all subject hospitals (Hospital Authority Annual 2014). All participants pointed out that corporate initiatives were a strong internal driving force to encourage them in developing and implementing a sustainable energy program. With a clear mandate and support from the corporate level, all of the participants pointed out that the hospital can set a strategy and position on energy savings, which was another main driving force for their energy saving activities. All of the subject hospitals have a

clear energy saving policy or statement posted on their website, which further strengthens the hospital's direction on the green measures as an important driving force for them to develop and implement a sustainable energy program. The findings from the interviews on internal driving forces confirmed the current literature that an organizational goal and strategy on corporate sustainability is a strong internal driving force to develop and implement a successful sustainable energy program (Caprar & Neville, 2012; Dobbs et al., 2016; Lozano, 2015; Robinson & Boulle, 2012).

Four participants pointed out that financial support from the corporate level was crucial to invest in sustainable equipment in their hospitals because they have not funded their regular operation costs, and hospitals have difficulty providing extra budgets for such substantial investments. The findings from these four participants added to the current knowledge on corporate sustainability because previous studies on private or for-profit organizations view financial support as an external driving force that can create financial benefits or return on investment (Ameer & Othman, 2012; McGain & Naylor, 2014; Naylor & Appleby, 2013). However, local public hospitals treated the financial support from the corporation as an essential resource allocation to comply with the hospitals' sustainable energy goal. All public hospitals in Hong Kong have received subsidies from the Hong Kong Government, and additional resources require a submission of an annual resource allocation plan with a nonmonetary deliverable set by the government, which is different from the for-profit or private hospitals.

The CSM by Epstein 2008 was the conceptual framework for this study. The CSM consists of input and output, and this study's findings on the internal and external

driving forces echoed the theories suggested by the CSM in the internal and external context parts. The CSM identified a few important external and internal contexts as input for successfully implementing corporate sustainability practices in an organization (Epstein, 2008). Internal contexts are company goals and mission of corporate sustainability, and external contexts are government corporate sustainability or environmental policies and regulations. The findings of this study on the internal and external drivers confirmed that hospital leaders could also use CSM as a conceptual framework to introduce a sustainable energy program in Hong Kong public hospitals.

Emergent Theme 2: Leadership

Current literature on corporate sustainability suggested that good leaders could help an organization to successfully implement sustainable measures (Eccles, Ioannou, & Serafeim, 2014; Strand, 2014). Other studies have also identified leadership skills as an essential element to build up a sustainable culture and to motivate staff to obtain a good outcome on green activities (Galpin et al., 2015; Whittington, 2012). The findings of this study confirmed that good leadership skills, including communication skills, influencing tactics, stakeholder engagement, and a people-centered approach, could help the hospitals to implement a sustainable energy program and to obtain ideal performance outcomes.

Communication skills. Business studies support that effective communication is one of the most important for leaders to achieve the organization's goals (Robles, 2012; Phelan & Sharpley, 2012). Study findings from four participants noted that they used effective communication skills to facilitate the implementation of the sustainable energy program. The sustainable policy or hospital goal on corporate sustainability was well

articulated in all levels of staff using both verbal and nonverbal forms of communication. Presentations and sharing sessions were conducted with the top management and frontline staff. Leaders of the green committee presented the sustainable program outcomes at the management meetings to further encourage staff to participate in in the hospital energy saving activities. The participants listened to staff concerns and ideas on new energy measures and provided feedback and support regarding their concerns. The subject hospitals sent posters, electronic mail, and printed materials to all staff to encourage them to practice in a sustainable energy manner. The study findings of the four participants confirmed the current studies on business practices on the use of good communication skills to lead the staff to achieve the company's goal.

Influencing tactics. Successful leaders can use influencing tactics to mobilize staff to comply with the company goal and mission (Gregoire & Arendt, 2014). All five participants pointed out that they used different influencing tactics to mobilize their staff to comply with the hospital's goal and mission in the energy saving program. Instead of using a top-down approach, four participants used a win-win approach to facilitate the implementation of the sustainable energy program. Staff received benefits/incentives for complying with the energy saving measures. For example, one of the hospitals introduced a new material for their uniforms to reduce the energy used to clean and dry them, and this measure can also help the hospital to solve the uniform shortage and supply problem due to the long cleaning process. The use of influencing tactics on achieving hospital energy saving initiatives in all of the study's hospitals confirmed that the use of influencing skills could help the organization achieve a company goal. Two participants

used the influencing tactics of creating peer pressure among staff by reporting the performance outcome in the senior meetings and the staff forum. Using peer pressure to enhance performance in these two participant hospitals confirmed the current study on healthcare performance management (Zidarov, Sicotte, Menon, Hallé, & Poissant, 2016).

Stakeholder engagement. Recent studies on how stakeholder engagement can help the leaders to achieve the organization's goals confirmed that stakeholder engagement is crucial in a successful business strategy and activity implementation. The findings of this study also echoed the current studies on stakeholder engagement. All five participants pointed out that stakeholder or staff engagement is one of the most important steps to facilitate the early stage of sustainable energy program implementation, and motivate and mobilize staff to practice energy saving initiatives. The participants also pointed out that it was important to identify the right person or leaders to join the green committee to facilitate the change in practices in the hospital. All of the participants suggested that engaging stakeholders from different levels is the key to implementing such administrative initiatives in a large hospital with different professional staffs, suppliers, and patients. Three participants revealed that they introduced a large-scale stakeholder engagement program in their hospitals from different staff levels, nongovernment organizations, and patients to facilitate the change in practices. For example, one participant hospital recruited more than 140 environmental protection ambassadors from all departments to promote and encourage other staff to comply with the hospital mission in energy savings. Document reviews of four subject hospitals suggested that their efforts are injected into stakeholder engagements. These three

documents included the key stakeholders on their green committee, and others nongovernment organizations and patient groups in their sustainable activities.

Transformational leaders. The study identified transformational leadership as helping the company to successfully adopt the change in practice in green measures (Metcalf & Benn, 2013). Transformational leadership is a leadership style that can lead the followers to successfully achieve a company goal by leading by example, inspiring followers, using a people-oriented approach, and growing with the followers (Choudhary, Akhtar, & Zaheer, 2013). The people-centered approach is one of the major organization values of the Hong Kong Hospital Authority. Four participants pointed out that a people-centered approach was used to implement the sustainable energy program in their hospitals. Four participants pointed out that one of their main leadership roles was to inspire their staff in the development of a sustainable energy program and grow with the staff on the hospital's green journey. The findings of this study confirmed the current studies that a transformational leader's style is favorable to help the company to achieve the goal of corporate sustainability.

Leadership belongs to the process part of the CSM. The supporting literature from the conceptual framework focused on how different leadership types, such as a transformational leader, can help the company to build up sustainable culture, instead of which specific leadership skill is required to perform the task. The CSM suggested that a transformational leader is a more effective leadership style to help the organization to achieve their goal in corporate sustainability (Epstein, 2008). However, the CSM did not elaborate in detail on which leadership skills of transformational leadership styles are

required in the framework and supporting literature to implement corporate sustainability successfully. The findings of this study provided additional knowledge on which specific leadership skills are necessary for a Hong Kong public hospital to develop and implement a sustainable energy program to reduce energy costs. Strong communication skills, good influencing tactics, and stakeholders' engagement are the main leadership skills that hospital leaders can apply to achieve their goal in a sustainable energy program.

Emergent Theme 3: Governance

One study showed that a company with strong corporate governance can obtain good performance in corporate sustainability activities (Jo & Harjoto, 2012). An Australian study suggested that good governance structures put in place to ensure that senior management is involved in sustainability strategy development can assist the company to obtain benefits (Klettner et al., 2014). The findings of this study confirmed the current studies on how good governance can be an effective approach to facilitate the development and implementation of the sustainable energy program at local public hospitals. All five participants pointed out that top management commitment and the involvement of relevant hospital leaders with the green committee were helpful in developing and implementing sustainable activities in their hospitals. The hospitals' leaders, with top management commitment, can deliver the hospitals' vision on sustainability to their staff at different levels. Also, these hospital leaders can influence their subordinates to practice the hospital energy saving programs. Five documents collected from the hospital green committee revealed that these hospitals have a robust governance structure at local hospital or corporate level with highest management

commitments and involvements. The hospital general managers were all involved as the chairperson, and these hospital green committees are under the supervision of a higher governance structure of the hospital led by the hospital chief executive to drive the development and implementation of such green activities including the sustainable energy program at their hospitals.

Studies suggested that the top-down approach is an effective strategy to facilitate change in sustainable measures (Asif, Searcy, Zutshi, & Fisscher, 2013; Lozano, 2013). However, all five participants pointed out that although they have a good governance structure for the hospital green committee, the top-down approach was not the major strategy used for the implementation of sustainable energy initiatives at their hospitals; instead, leadership skills with strong influencing tactics and communication skills are frequently applied for non-clinical services at a public hospital in Hong Kong. The conceptual framework of this study, the CSM, also suggested that a top-down governance initiative could be an effective approach for implementation of sustainable measures in an organization (Epstein, 2008). The findings of this study supported the CSM on the importance of having a strong governance structure on corporate sustainability initiatives, but leaders of local public hospitals mainly applied leadership skills to facilitate the development and implementation of the sustainable energy program at their hospitals.

Emergent Theme 4: Building sustainable culture

Five hospital leaders in the study pointed out that one of the steps to ensure the successful implementation of a sustainable energy program was to build up and maintain a strong sustainable culture in their hospitals. A leader can help an organization to

achieve its corporate sustainability goal by building up a strong organizational culture (Strand, 2014). Organizational culture is the norm and the way the staff thinks and acts in the company (Liu, Li, Zhu, Cai, & Wang, 2014). Another study showed that an organization with strong corporate sustainability culture can outperform in sustainable measures and is more capable of obtaining benefits for the company (Engert & Baumgartner, 2016). To enhance the sustainable awareness, all five participants introduced a series of culture-building activities in their hospitals including a training program for new staff, regular knowledge sharing, a promotion carnival, and energy saving competition programs. To strengthen the sustainable culture, three of the subject hospitals incorporated corporate sustainability into their hospital strategy. However, two participants reported that the patient-centered culture was one of the barriers for them to build up a sustainable culture because two cultures may have contradictions in a hospital that operates 24 hours a day and seven days a week. The findings of this study confirmed the current studies on the effect of building a strong sustainable organizational culture as a strategy to help a company to implement and outperform in corporate sustainability measures.

The findings of this study suggested that leaders of the hospital green committees spent efforts to build up a sustainable culture in their hospitals by introducing various capacity building activities, and intergraded it into the hospital strategy to facilitate the development and implementation of sustainable measures, including an energy saving program. The findings on sustainable culture-building also confirmed the CSM that integrating sustainability into organizational culture can help formulate and implement

related activities and achieve desirable outcomes in corporate sustainability initiatives (Epstein, 2008).

Emergent Theme 5: Performance measure

Implementing sustainability measures has resource implications such as equipment investments (Papagiannakis, Voudouris, & Lioukas, 2014). An effective evaluation tool or method can help the leaders to evaluate the success of the sustainable activities (Sahamir & Zakaria, 2014). A good assessment tool can also help the organization to determine the insufficiency of the current sustainable measures and to formulate an improvement plan (Epstein & Buhovac, 2014). The findings of this study revealed that performance measures of a sustainable energy program could help the hospital to engage staff, to develop an improvement plan, and to further strengthen sustainable culture in their hospitals. All of the subject hospitals used various performance measures to evaluate their programs' effectiveness. Two of the common approaches used were awards from other recognized green organizations and performance outcomes set by the hospital green committee for each program. Four participants pointed out that they regularly present the sustainable evaluation results to both frontline staff and management to enhance stakeholders' awareness and to formulate an improvement plan. Two participants said that by comparing the results to their previous performance across departments, frontline managers and staff increased compliance in the hospital sustainable energy initiatives due to the effect of peer pressure. Three hospital leaders said the awards from other recognized green organizations were good encouragement for strengthening the sustainable culture and for recognizing their

efforts on the sustainability programs. Four participants pointed out that meeting the energy saving targets set by the green committee and report in the hospital management board is a mandate for the program initiated by the corporate level management.

The findings of this study confirmed the current literature on the functions and benefits of applying performance measures or assessments on the sustainable programs include monitoring, controlling, evaluating, and improving current sustainable practices in an organization (Epstein & Buhovac, 2014). The findings of this study also provided additional knowledge on the current corporate sustainability practices in the public hospitals. The authors of a study reviewed 101 studies on sustainability performance measurements, and found that private organizations used mainly financial benefits to assess their company performance on corporate sustainability (Goyal, Rahman, & Kazmi, 2013). However, according to the findings of this study, Hong Kong public hospital leaders did not assess their sustainable measures performance with financial achievement. Instead, they used non-monetary indicators such as awards from other green organizations and the energy saving unit of each program set by the hospital green committee for performance evaluation. According to the participants of this study, thery pointed out that sustainable energy performance measures can be an effective influencing tool to motivate staff to improve performance in their hospitals because departments and dvisions are comparing their results to each other. Also, the findings of this study on performance measures aligned with the conceptual framework in this study that leaders can use it as a driver to introduce, execute, and outperform in sustainability business (Epstein, 2008).

Application to Professional Practice

The results of this study may serve to the hospital leaders in the public sector for filling the knowledge gap in which strategies could help the local public hospital to develop and implement a sustainable energy program. The findings of this study provide additional references for Hong Kong public hospital leaders to establish a strategy to handle the persistent problem of the rate of high energy consumption among other Hong Kong public hospitals. By analyzing the interview data and document reviews of the five local hospitals who have received government recognitions, local hospital leaders can explore the external and internal driving forces, apply proper leadership skills and governance structure, build a sustainable culture, and introduce the performance measures when developing and implementing a sustainable energy program at their hospitals. According to a review study, an organization needs a conceptual framework that the management can rely on to develop, implement, control, and improve corporate sustainability strategies to obtain desirable outcomes (Baumgartner, 2014). All of the participants' hospitals have a clear framework or guideline on corporate sustainability measures committed by strategic level management. The hospital green committee can formulate strategies and action plans according to the framework for the staff to comply with the requirements. All participants used the external and internal driving forces to initiate and sustain their sustainable energy program. Studies suggested that a lack of drivers to change is one of the barriers to corporate sustainability development (Lozano, 2013). Also, as a government subsidiary organization, government policy, hospital

support, and public expectations are the important drivers for adopting a sustainable practice.

All participants used both soft and hard skills to facilitate the development and implementation of the sustainable program. Galpin and Lee Whittington (2012) suggested that a transformational leadership approach is more effective to help the company to implement change to a sustainable practice. One of the main strategies used by the participants in this study is to apply transformational leadership skills to influence the change in practice in the hospitals, and leadership skills included good communication, influencing tactics, stakeholder engagement, and a people-centered approach. Lozano (2013) pointed out that changing existing company culture is a barrier to the implementation of corporate sustainability. All participants observed a culture change throughout their green journey by injecting efforts in building a corporate sustainability culture in their hospitals. Measures to build a sustainable culture included provide knowledge sharing and training, conducting promotion activities, and distributing printed and electronic education materials to the staff.

The literature shows that a company can implement performance measures to manage and to improve current sustainability achievements (Epstein & Buhovac, 2014; Searcy, 2012). All of the participants in this study observed positive effects after introducing performance measures as one of the strategies for their corporate sustainability management. Increased compliance in the sustainable program strengthened the sustainable culture, and enhanced motivation on sustainable initiatives

are the positive effects resulting from introducing performance measures such as targets set by the hospital green committee and awards from other green organizations.

Implication for Social Change

Society may benefit from the results of my study because Hong Kong hospital energy consumption is reaching 100 million Hong Kong dollars annually (Tong & Fong, 2014). The Hong Kong Government is funding approximately 50 billion Hong Kong dollars to all 42 public hospitals (Hong Kong Hospital Authority, 2014). According to current studies on sustainable energy, implementing a sustainable energy program at the hospitals can reduce energy consumption by 20% (Naylor & Appleby, 2013). Also, the energy cost is equivalent to around 1-3% of hospitals' operating costs (McGain & Naylor, 2014). As a government subsidiary, public hospitals provide a quality healthcare service for more than 90% of the population. Thus, proper use of public money can be one of their challenges. Therefore, the findings of this study are the analysis results of five local public hospitals that successfully implemented a sustainable energy program and received recognition from the government body. The findings of this study can provide additional knowledge to existing frameworks or guidelines for the development and management of sustainability business in the hospital. The results add value to the existing CSM by Epstein by incorporating culture and organizational considerations. Hospital leaders can use these findings to develop and implement the sustainable program and to reduce energy consumption and reallocate the resources to other patient service quality improvement initiatives (McGain & Naylor, 2014).

Improvement in environmental pollution is another implication of this study for social change. Hospitals are one of the most polluting industries because of their operating model of 24 hours a day and seven days a week (Alemayehu, Alemayehu, & Assefa, 2015). Environmental pollution causes climate change, which further increases the incidence of other infectious, respiratory, and cardiovascular diseases that further worsen the financial burden of our healthcare system (Watts et al., 2015). Air pollution in Hong Kong caused more than 3,000 premature deaths and a monetary loss of 39 billion Hong Kong dollars in 2012 (South China Morning Post, 2015). Local hospital leaders can implement measures according to the added knowledge to reduce carbon emissions. The reduction in environmental pollution can further reduce the negative health effects caused by climate change, which can alleviate the financial burden of health services (Thompson et al., 2013; Woodward et al., 2014).

Recommendation for Further Action

The Hong Kong Hospital Authority establishes its annual plan every year according to the strategic intent suggestions in the 5 years strategic plan. The annual plan includes well-written strategic intentions and program details for all Hong Kong public hospitals to follow. Hospital activities' development and implementation are following the strategic intents set by the corporate management. Studies and findings of this study identified that strategic or top management commitment is the key to success in corporate sustainability development (Chen & Jermias, 2014; Galpin et al., 2015; Goyal, Rahman, & Kazmi, 2013; Klettner et al., 2014). To formulate and implement a sustainable energy program in all public hospitals, strategic or corporate level management should consider

incorporating the corporate sustainability initiatives into their annual plan. Also, corporate level management should consider adopting a corporate sustainability conceptual framework to facilitate the development because the study and the findings of this study suggest that hospitals that have good development and performance of sustainable energy measures adopted a clear framework and guideline for sustainable practice (Baumgartner, 2014).

Strategic and hospital management levels should consider formulating a robust governance structure on corporate sustainability management and development. A governance structure that is engaged with all stakeholders can help the hospitals in Hong Kong to formulate strategies and action plans in a multidisciplinary hospital setting. Also, due to a collaboration culture in Hong Kong public hospitals, a governance structure on corporate sustainability can further enhance the employee compliance with the hospital sustainable energy activities and initiatives. However, instead of focusing on a top-down approach to mobilizing staff to comply with sustainable energy measures, hospital leaders should apply soft skills such as good communication skills, influencing tactics, stakeholder engagement, and a people-centered approach. The findings of this study showed that the leaders of the subject hospitals frequently used a more transformational leadership style to accomplish the hospital sustainable energy goals. Being people-centered is one of the organizational values of the Hong Kong Hospital Authority (Hospital Authority Annual Report, 2013), and a transformational leader uses a people-oriented strategy to help the company to achieve its goal (Choudhary et al., 2013). Hospital management can consider providing training on leadership to the hospital green

committee members to strengthen their competency in managing a sustainable energy program at their hospitals.

Lozano (2015) noted that a leader could build a culture of corporate sustainability in the organization to facilitate implementation and to obtain a desirable performance in the sustainability business. The local hospital management may consider introducing measures to build up, enhance, and maintain a strong sustainable culture for the sustainable energy management. Chairpersons of the subject hospitals implemented a series of programs to enhance the sustainable culture in their hospitals. Measures have included staff competency-building, exchange of site visits, promotional activities, and internal and external energy saving competitions. The participants pointed out that these awareness-building activities can help the hospitals to incorporate the sustainability mindset into the hospital culture and drive the staff to change in practice. However, as a public hospital with a high service workload and limited budget, to ensure these programs or activities are sustainable, leaders should consider the resources and service provision implications before introducing the culture-building activities.

Management of local hospitals may introduce performance measures to their sustainable activities for monitoring, controlling, evaluating, and improving their purpose. The participants of the study hospitals used performance to find out any insufficiency in their sustainable energy program and to formulate a future improvement plan. Also, these hospitals used the performance measures as their strategies to further strengthen the sustainable culture in their hospitals. Hospital green committees can set the specific goals for each sustainable energy program and report to the management and frontline staff.

The participants reported that staff increased compliance by comparing their performances to other departments. Hospital green committees can participate in energy savings competitions organized by other recognized green organizations such as the Hong Kong Awards for Environmental Excellence by the government sector. Encouragement and achievement in these awards can enhance staff motivation and participation in the hospital energy saving initiatives. However, none of the hospital leaders in this study used monetary indicators for measuring their performance because financial benefits for the hospital is not a high priority task in the public sector.

Recommendation for Further Research

The public hospitals may consider conducting a study on the benefits of implementing a sustainable energy program on patient service quality. At a public hospital, the participants used non-monetary indicators to measure the effectiveness of their sustainable energy program. Ensuring quality and safe service is one of the major strategic intents in the 2013 Hospital Annual Plan. Leaders of local public hospitals can investigate the improvements on service quality by reinvesting the money saved from the sustainable energy programs. Service quality improvement may have resource implications, for example, the employment of additional staff, procurement of new drugs, and advancement on new healthcare devices (Hussey, Wertheimer, & Mehrotra, 2013). A future study on how a sustainable energy program can benefit patient service quality may further encourage local hospital leaders to adopt a sustainable energy program at their hospitals.

Hong Kong public hospital leaders may consider conducting a study on the development or adoption of a conceptual framework that fits the local healthcare context. A sustainability framework will help the hospital leaders formulate and implement a successful sustainable energy program. However, currently, the majority of local public hospitals do not have a clear sustainable framework to follow. Researchers may collaborate with local hospitals leaders to design a framework that can include the culture and organizational difference into account. The NHS developed a sustainable route map that provides direction for clinical leaders in achieving successful guideline implementation (Higuchi, Downey, Davies, Bajnok, & Waggott, 2013). Hong Kong public hospitals leaders may consider studying how this English framework can fit the local healthcare setting.

Reflections

Before beginning a healthcare management doctorate in the business administration program, I have been working as a clinician in the public sector for more than 10 years. I am also involved in other community health promotion and policy-making projects with the local government. One of my main duties is to conduct clinical and community research or service evaluation projects. Until I started this degree, I discovered that there is another world in healthcare research that I had never noticed before. The knowledge and skills in healthcare management research helps me to plan, manage, monitor, and evaluate the daily clinical and administration duties. Besides, by understanding healthcare management knowledge, I can align all of my clinical projects or service developments to the corporate and hospital level strategic intentions. This

ability is very helpful for me to accomplish my plan and project according to the hospital and corporate directions.

Another valuable thing I learned from this doctorate is the academic skill and knowledge that was applied in writing my dissertation. Starting from the literature review, writing the proposal, and getting approval from the committee members and IRB, these experiences are very important for my future career development. Although it was a difficult journey for me, I overcame these difficulties with the support of my teacher, advisors, friends, and family. I finally completed the requirements for a doctoral student and can now apply the high level academic skills and knowledge learned in this program to further enhance my capacity in pursuing my career in the Hong Kong healthcare industry.

Conclusion

Hospitals are one of the most polluting industries. The 24 hours-a-day and seven-days-a-week operation model consumes a high level of energy. Hong Kong public hospitals are facing a high energy consumption problem. Studies have shown that introducing a sustainable energy program can help hospitals to save around 20% of its energy consumption. Hospital leaders in Hong Kong may consider looking for strategies to implement a sustainable energy program to reduce costs.

The findings of this study show that local public hospitals can successfully implement a sustainable energy program with a multicomponent strategy approach. The highest level of management should consider adopting a corporate sustainability framework to formulate a strategy and develop programs. A robust governance structure

with the commitment of the top management and engagement of all major stakeholders can help the hospital to deliver the green message and to achieve a desirable performance. Leadership skills such as good communication techniques, influencing tactics, stakeholder engagement methods, and a people-centered approach are promising for developing and implementing a sustainable energy program at local public hospitals. Hospital leaders should introduce culture-building activities as one of the strategies for developing and implementing sustainable energy programs. It is important to incorporate the sustainability culture into the organizational culture for sustainability in the long term. Finally, performance measures are crucial to the development and implementation of a sustainable energy program in local public hospitals. Hospital leaders may consider introducing performance indicators for their initiatives to obtain good compliance with and ideal performance of their sustainable energy programs.

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Appendix A - Interview Protocol

Research Topic:
Exploring the strategies to implement a sustainable energy program in Hong Kong Hospitals
Date _____
Time _____
Location _____
Interviewer _____
Interviewee _____
Consent form signed? _Y/N_

Notes to interviewee:
Thank you for your participation. I believe your input will be valuable to this research and in helping grow all of our professional practice.

Confidentiality of responses is guaranteed:
To facilitate our note-taking, I would like to audio tape our conversations today. Please sign the consent form. For your information, only researchers on the project will be privy to the tapes which will be eventually destroyed after they are transcribed. In addition, you must sign a form devised to meet our human subject requirements. Thank you for your agreeing to participate.

Duration:
The interview will take less than 30 minutes. During this time, I have several questions that would like to cover. If time begins to run short, it may be necessary to interrupt you in order to push ahead and complete this line of questioning.

Purpose of research:
The purpose of this qualitative research, multiple case study is to explore the strategy required to develop and implement an effective sustainable energy program in Hong Kong public hospitals to reduce their energy costs.

Interview questions:
1. Can you tell me what corporate sustainability in hospital means to you?
2. What are the external and internal driving forces/ motivation to facilitate the implementation of sustainable energy program in your hospitals?
3. As the leader of the hospital green management committee, what is your role in managing the sustainable practice in the hospital?
4. What is your management strategies/ approaches/ tools you used to facilitate the successful implementation of sustainable energy program at your hospital?

5. How you comment on the organization structure of green management committee at your hospital?
6. How can you mobilize and motivate your staff/ stakeholders to develop and implement a sustainable energy program at your hospital?
7. Can you tell me what skill, knowledge, and training for your staff to practice in a sustainable manner?
8. What are the hospital performance measures to the sustainable energy program?
9. Can you tell me the challenges/ barrier to implementing the sustainable energy program at your hospital and how would you overcome them?

Appendix B – Sample Interview Summary

Participant: 01
Date: XXX
Venue: XXX
Interview questions:

1. Can you tell me what corporate sustainability measures are implemented in your hospital?

   Measures including solar water heating, catering food waste reduction computer program, and energy saving measures in the laundry. One of the most important measure is to build up sustainability culture and awareness in the hospital that helped to facilitate implementation of those sustainability measures.

2. What are the external and internal driving forces/ motivation to facilitate the implementation of sustainable energy program in your hospitals?

   The external driving forces such as government policy in waste management, CO2 production regulation, and energy saving recommendations. The government guidelines/ policy act as the basic or minimal requirement or guiding principles that hospital required to follow. The Internal driving, such as hospital sustainability policy/ statements/ strategy even is a stronger/ higher standard driving force for hospital to achieve sustainability/ environmental protection measures.

3. As the leader of the hospital green/environmental/energy management committee, what is your role in managing the sustainable practice in the hospital?

   Leadership roles including to create vision for the hospital staff and broaden the view to allow staff to think and act on sustainability measures. This is important to let the staff and other stakeholder the need to change/ and practice in sustainable measures.

4. What is your management strategies/ approaches/ tools you used to facilitate the successful implementation of sustainable energy program at your hospital?

   There are 3 levels of approach to achieve sustainability in hospital: Frist level is to cultivate awareness and habit and mindset of energy saving, environmental protection among staff. The second level is to provide guidelines/ administrative measures and some rules and regulation on sustainability such as temperature recommendation, lighting regulation. This level measure can help to achieve outcome on sustainability measures implemented. The third level involved

investments, for example, using LED light, energy saving chillers. This level allowed a measureable outcomes of the sustainable investments. However, build up the sustainable culture and awareness is very important to carry out those measures in the hospital.

5. How would you comment on the organization structure of green management committee at your hospital?

   Top management committee (hospital chief executive) is crucial in developing and implementing sustainable measures in hospital. The senior management cultivate sustainability awareness for more than 20 years in their hospital. The structure of the green committee composed with different specialists from different hospital departments. They are dept. in-charge or manager which can facilitate their staff to participate in sustainable measures. An important governance approach to

6. How can you mobilize and motivate your staff/ stakeholders to develop and implement a sustainable energy program at your hospital?

   Besides hospital governance, a win-win approach was used to motive staff to practice in sustainability. For example, instead of telling staff to save energy, they changed the uniform to a more environmental materials that uses less water to clean and more east to dry. This measure allow the staff to solve the uniform supply issue whereas to save a lot water and energy used. This is an effective influencing tactic used by the management for implementing sustainable measures in our hospital.

7. Can you tell me what skill, knowledge, and training are necessary for your staff to practice in a sustainable manner?

   This is important to educate staff for environmental protection because it is a culture building. Our hospital provide environmental protection/ sustainability training during their orientation program. Hospital also conducted relevant knowledge sharing regularly to promote sustainability. Regular activities such as booth in carnival and energy saving promotion, CO2 reduction sharing are also useful to strengthen the culture of hospital corporate sustainability.

8. What are the hospital performance/outcome measures to the sustainable energy program?

   Each sustainable program has an evaluation target. Instead of representing of unit of money saved, we use outcome measures such as is the unit of energy saved or how much water saved/ how much of CO2 production reduced to evaluate

effectiveness of those measures implemented. This is an important message to our stakeholder to letting them know the achievement of the sustainable programs to further encourage and strengthen their awareness and practice in continuing sustainable practice. Recognition from stakeholder such as government award and management feedback are also important performance measures to the green hospital committee.

9. Can you tell me the challenges/ barrier to implementing the sustainable energy program at your hospital and how would you overcome them?

It is uneasy to implement sustainability such as temperature control, energy saving program in hospital because we have to align with patient-centred care in hospital and some of the measures will contradict with our value in providing high quality and safe service in hospital. For example, temp control is not easy to implement in some wards areas because of infection control regulation. Collaboration is an important strategy to successfully to overcome this barrier. Leadership, good communication skill, and stakeholder management are also essential elements for building up a sustainable hospital.