Assessment of sustainable hospital supply chain management practices-The case of Black Lion Specialized Hospital

By

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DECLARATION

I the undersigned, hereby declare that the work which is presented in this thesis entitled **"*Assessment of sustainable hospital supply chain management practices-The case of Black lion hospital"*** is the orginal work of my own effort and done under the guidance of Tariku Jebena(PhD), and that all sources of materials used for the study have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other university for the purpose of earning any degree.

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This is to certify that the thesis prepared by MahletTsegaye, entitled Assessment of sustainable hospital supply chain management practices-The case of Black lion specialized hospital Submitted in partial fulfillment of the requirement for the degree of Master of Arts in Logistics and Supply Chain Management complies with the regulation of the university and meets the accepted standards with respect to originality and quality.

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Abstract

Hospitals account for 40% of the total health expenditures, from this 30-40% of the hospital budget is spent on supply chain costs. By aligning the 'triple bottom line'-environmental, social, and economic dimensions in the hospital supply chain 8% of the cost can be abridged offering better conditions to employees and communities. Black Lion specialized hospital (BLSH) is one of the leading referral hospitals run by Addis Ababa University serving a wide range of the population in Ethiopia. The study aims to assess the current practice of sustainable supply chain management in BLHS.A qualitative exploratory design with in-depth interview and observation filed notes methods was used to gain an insight into sustainable hospital supply chain management practices regarding economic, social, and environmental perspectives.From the analysis, six themes emerged which are (i) Environmental, (ii) Transport and distribution, (iii) Finance and supply, (IV) Human resource, (I) infrastructure, and (VI) Relationships. Each theme is further classified into sub-themes. Some of the sustainable hospital supply chain management practices are implemented in BLSH without putting them as a strategy. Environmental sustainability didn't get enough attention. Since the three dimensions of sustainability are interlinked the problem raised from an environmental perspective is resulting in social concerns from the community. The hospital is currently suffering from the current cash collecting and credit system. Hospital staffs are not satisfied with the current work environment.

Keywords; Sustainability, Hospital, Environment, Economic, Social, Supply chain

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Acronyms and Abbreviations

SCM – Supply Chain Management

HR– Human Resource

SSCM– Sustainable Supply Chain Management

SSC – Service supply Chain

GDP- Gross Domestic Product

US– United States

EU– European Union

MOH – Ministry Of Health

GTP - Growth and Transformation Plan

SDP-Strategy and Defense Policy

OCED- Organisation for Economic Cooperation and Development

ILO–International Labour Organization

WCED- World Commission on Environment and Development

GSCM – Green Suppy Chain Management

UN – United Nations

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CHAPTER ONE: INTRODUCTION

The purpose of this is to describe the current practice of sustainable hospital supply chain management in the Black lion specialized hospital. This introductory chapter provides the necessary background and context for the reader to understand the subsequent findings and recommendations.

1.1.Background of study

Supply chain management (SCM) is the management of products or services from the design phase to the different production stages starting with raw material extraction and ending with the delivery of the product/service to the end consumer and, eventually, the reuse, recycling, or disposal phase, depending on the product/service, industries, and business models of firms. This includes the management of material, information, and capital flows as well as the management of human resources (HR) to deliver the product/service to the consumers at a low cost, quickly and at the right place, while still ensuring the quality of the product/service. (Fritz, 2013)

Recently, there has been an increase in the number of customer concerns about conditions under which products are produced and whether the products should be treated sustainably. Sustainability is a new trend in Supply Chain Management and is a conceptual framework for aligning the 'triple bottom line'-environmental, social, and economic dimensions.(Ashby, Leat, & Hudson-Smith, 2012) Consequently, supply chain managers are concerned with not only the basic criteria for evaluating components and materials (e.g., cost, quality, and delivery) but also the solutions for reducing environmental and social impacts (Lam, 2015).

The most often quoted definition of sustainability is that of the Brundtland Commission as *"development that meets the needs of the present without compromising the ability of future generations to meet their needs."* Sustainable Supply Chain Management (SSCM) has defined by (Carter & Rogers, 2008) as *the strategic achievement and integration of an organization's social, environmental and economic goals through the systematic coordination of key inter-organization business processes to improve the long term economic performance of the individual company and its value network."*

Environmental sustainability is the most recognized dimension as corporations seek to reduce the natural resource consumption below the natural reproduction in both the processes and products it produces. Economic sustainability refers to the profitability of sustainable efforts. Social sustainability can be divided into both internal and external dimensions. Internal social sustainability refers to the motivation, skills, and loyalty of employees and business partners in the supply chain, while external social sustainability refers to the value that is added to the community that the company operates. (Fish, 2015)

The service supply chain (SSC) implementation has become a trend since the service sector gives a significant contribution to the *gross domestic product* (GDP). The healthcare industryconstitutes one of the most significant segments of the servicesector in all developed and developing countries. In the US, the healthcare industryaccounts for 16 percent of GDP, whereas the EU's average is around 10 percent(World Bank). In Ethiopia, the healthcareindustry accounts for 4.2 percent of GDP, with total health spending during 2016/2017 ETB 72.1 billion (US $3.1 billion) (MOH of Ethiopia, 2019).Ethiopia's five-year Health SectorTransformation Plan (2015/16-2019/20) calls for improvements in logistics management andtechnologies to increase the efficiency of resource use.

Healthcare supply chain management involves obtaining resources, managing supplies, and delivering goods and services to providers and patients(Jacqueline, 2016). From delivering prescriptions to providing patients transportation to and from the doctor, innovation in healthcare logistics facilitates the evolution of a new kind of value-based supply chain. Analyzing and aligning supply chain goals with a patient-first approach enables healthcare organizations to reduce costs while improving patient outcomes(Reid, 2019).

Sustainability is like an iceberg. Most of us know something about it, but there are many aspects hidden beneath the surface. Therefore it is important to identify patterns, trends, and systemic structures behind the problems and phenomena for finding solutions. (Maschinen, Investition, Beschaffungen, Ersatzbeschaffungen, & Mittelherkunft, 2018). To address concept of sustainability, they encourage multidisciplinary research that could capture new and more and this study can contribute by determining the current sustainable hospital supply chain management practices in a specialized governmental hospital.

1.2.**About Black Lion specialized hospital**

Black lion Specialized Hospital established in 1972 providing services for the whole country as a medical training center. 1998 the hospital is transferred to the school by the Federal Ministry of Health, and ever since it becomes a teaching hospital. It is now the largest referral hospital in the country with 850 beds with major operations of the hospital are to provide medical services, training to undergraduate and graduate programs in the College of Health Sciences and medical residents, and conducting research in the health sciences. It is also an institution where specialized comprehensive clinical services that are not available in other public and private institutes are rendered. It also has the lion share of health care delivery in the country. The hospital offers

treatment for approximately 370,000-4,000,000 patients per year. The hospital has more than 465 physicians, 992 nurses, 79 pharmacists, and 115 other health care providers. There are 26 follow up clinics in the hospital including chronic-care clinics where patients with chronic disease including hypertensive and diabetes mellitus patients are scheduled to visit based on an appointment period for follow-up. (AAU, 2017)

1.3. Problem statment

Worldwide, governments are grasping the benefits of green procurement practices such as cost savings from reduced energy consumption, resource use, and material management. (Lacroix, Laios, & Moschuris, 2011)Ethiopia has integrated the sustainable development goals within its Second Five Year Growth and Transformation Plan (GTP II) spanning the period 2015/16-2019/20 with a full sense of national ownership (SDP, 2017). The concept of sustainable hospital supply chain management remains widely unimplemented despite many health care organizations have recognized the importance of adopting supply chain management practices. (de Vries & Huijsman, 2011)

Out of the supply chain costs, the budget for hospitals which accounts 30% to 40%(Landry, Beaulieu, & Roy, 2016), according to the Organization for Economic Co-operation and Development (OCED, 2017) can be abridged by 8% using best practice(McKone-Sweet, Hamilton, & Willis, 2005). Furthermore, they added, best practices allow clinical personnel to focus on their core mission of caring (Landry et al., 2016). According to a Cardinal Health survey in 2019, 45% of front-line providers disclose that manual supply chain tasks have a “very” or “somewhat” negative impact on patient care while 42% of respondents believe supply chain work takes too much time away from patient care(Cardinal Health, 2019).

As the health sector is the largest sector consuming a huge budget from the total GDP it uses different products like pharmaceuticals, medical and building supplies, and foods. While procuring products considering environmental aspects of the SSCM has resulted in cost savings through reducing waste (World Health Organization, 2019). Due to this, hospitals are considered as one of the institutes in which there is a significant amount of material, energy, and water is consumed and a place where a large number of wastes are produced.

Social problems that exist in the hospital's supply chain reported include problems such as the shift of work, it was reported that its common to surpass legal bounds of daily working hours (ILO, 2017). Long working hours not only increase the probability of accidents while on duty, and develop exhaustions and additional psychological stress than in other jobs (De La Cruz & Abellan, 2015), but also affects the quality of patient care (Aiken, Sloane, Bruyneel, Van den Heede, & Sermeus, 2013). The hospital employee's well-being is positively related to the enhancement of the environment and better overall sustainability performance outcomes (Rothenberg, Pil, & Maxwell, 2001).

With this in mind, it is very important to consider the three SSCM dimensions to be more environmentally-friendly, and offering better environments to both employees and communities served, leads to the subjects of SSCM practices. Best practices are tied to the aim that which is recognized as greater by the majority (Landry et al., 2016) regardless of the way that practices are defined, whether as organizational routines, rules, or standard procedures (Parmigiani & Howard-Grenville, 2011)

Frequent stock outs of medicines and laboratory reagents with weak quantification and procurement practice at BLSH were reported by ShimelisAdmassu(Admassu, 2016). Another

study shows that BLSH a significant gap between the cost it incur and the user fees it collect with 21% of the service with 0 cost recovery ration (CRR), 58% of the service with 1 to 25% CRR and 10% of the service with 26-50% CRR and 5% of the service with 50-100% CRR . (Yusuf, 2010)

However, a lack of research on holistic approach into sustainable hospital supply chain management practices in Ethiopia is identified. To address these gaps, this paper presents Assessment of sustainable hospital supply chain management practices in Black Lion Hospital.

1.4.Research Objectives

1.4.1. General objective

- To assess the current practice of sustainable supply chain management of Black Lion Specialized Hospital.

1.4.2. Specific objectives

- To assess the current practice of SSCM from the economic dimension.
- To assess the current practice of SSCM from environmental dimension
- To assess the current practice of SSCM from the social dimension.

1.5.Research question

On the stated objectives the following basic questions were raised and attempted the researcher to want to answer the following questions:

I. How is the current sustainable supply chain management practice of Black Lion Specialized Hospital from the economic dimension?
II. How is the current sustainable supply chain management practice of Black Lion Specialized Hospital from the environmental dimension?
III. How is the current sustainable supply chain management practice of Black Lion Specialized Hospital from the social dimension?

1.6.Significance of study

The study will contribute to the healthcare industry by examining the current practice of sustainable hospital supply chain. Hospital administrators and staff could use this feedback to assess their practice against other competitive hospitals and international practices.

Researchers and academicians would find the outcome of this research valuable to their study and the advancement of knowledge. This research would provide useful contributions to the understanding of sustainability in the health sector from the hospital`s perspective.

This research is also intended to solve some of the existing research gaps. Moreover, the study could help researchers to build knowledge and set the stage on which future researches could be built in the area of sustainable hospital supply chain management.

1.7.**Scope of Study**

Temporal scope: The study was conducted through in-depth interviews related to sustainable hospital supply chain management practices with employees of the study organization (BLSH) period from April22- May22, 2020 per their responsibility within the organization. **Geographical scope:** the study was only aimed to look the internal organization perspective towards the sustainable hospital supply chain management thus data were collected only from BLSH.

Conceptual scope: Sustainable hospital supply chain management from the perspective of sustainability (economic, environmental, and social). The study adopts a firm perspective with the main focused around 12 categories of management practices, which includes energy; water; food; hospital design; waste; transportation and distribution; strategic management and leadership;

supplier management; information and technology; purchasing; warehousing and inventory and customer relationship management. As studies like this are on service supply, it attempts to bridge such research gaps and inform the organization towards strategies to appropriately implement sustainable hospital supply chain management.

1.8.Organization of Study

The study is organized into five chapters: Chapter one will deal with the background of the study; statement of the problem; objectives; and research questions; the scope of the study; the significance of the study; limitation of the study and operational definition of terms and concepts. Chapter two will include a review of the literature. It will cover the theoretical and empirical literature and conceptual frameworks. Chapter three will focus on research methodology which will include the rationale for the selection of research area; study design and sampling techniques; data collection methods and analysis. Chapter four will be about the results and discussion of data. Finally, chapter five will contain a summary of the research finding, conclusions, remarks, and recommendations for future action.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

This chapter is divided into three sections. The first is the theoretical literature where the theoretical establishment of sustainable hospital supply chain management is discussed. The second section states empirical literature were practical researches were reviewed and presented and the third states the conceptual framework.

2.1.Theoretical literature

The concept of sustainable supply chain management came to evolve when the globe faces significant global warming and degradation of the ecosystem in the era of industrial evolution this brings to the new sustainable development goals of the UN Agenda 2030 (United nations, 2015)is based on the idea of green and just growth, which can provide fundaments for fulfilling the basic needs of all people on our planet.

To date, no consensus exists to define the term “sustainable supply chain management” (Ahi & Searcy, 2013). Relative to SSCM, SCM is a well-established field of research for instance, at transportation, network management, or demand planning, this is less the case of sustainable supply chain management (SSCM). To define SSCM, most of the scientific work on SSCM refers to the three pillars of sustainability defined in the Brundtland report as the social, environmental, and economic pillars (WCED, 1988). Since SSCM is a concept originating from industrialized countries, with a rising interest in research and practice starting from the late 2000s, SSCM has long been associated with reduction of unnecessary costs and improvement of environmental and economic performance through collaboration of firms for one goal. Indeed, social issues were less of a matter insuch economies where topics such as child, forced labor, or slavery are expected nowadays not toexist anymore. Consequently,

interchangeable use of terms such as green supply chainmanagement (GSCM) and sustainable supply chain management (SSCM) is common. In this entry,GSCM will be used to refer only to the environmental performance of SC, while SSCM will be used to refer to the economic, environmental, and social performance of SC. With regard, SSCM can be defined according to (Seuring & Müller, 2008) as: "*The management of material,information and capital flows as well as cooperation among companies along the supply chainwhile taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements.*"

While many different sub-topics are preceding the term SSCM, two common terms are repeatedly mentioned which are "Reverse Logistics and Green supply chain management". While both look to reduce the environmental impacts of SCs. One captures the reverse flows of products and the other paths forward flow of SC. The other classification of sustainability is through internal and external factors.

(Gimenez & Tachizawa, 2012)defined enablers as the factors that assist firms in achieving sustainability practices. Internal enablers include but are not limited to the firm's environmental commitment; top management support; resource availability; purchasing personnel's supply management capability and proper performance measurement systems. External enablers include supply chain-related capabilities such as trust, national culture, and logistical and technological integration.

Sustainability has been a major concern of international health program professionals, most notably since the 1990s, with the general observation that the sustainability of health programs in developing countries remains an unresolved issue in many ways (Shediac-Rizkallah & Bone, 1998).

The World Health Organization defines an environmentally sustainable health system as one that "improves, maintains or restores health, while minimizing negative impacts on the environment and leveraging opportunities to restore and improve it, to the benefit of the health and well-being of current and future generations". Environmental sustainability is considered implemented in health care system when resources are used in efficient manner without putting the environment in jeopardy and compromising the quality of care for patients.

2.2. Empirical literature

The majority of the scholars have been engaging with empirical methods, either quantitative or qualitative, to create theoretical frameworks that entail drivers (Soltani, Ahmed, Liao, & Anosike, 2014). In recent years some scholars have argued that in its majority, the literature on SSCM has been following a dichotomist view on creating frameworks for SSCM drivers, following either deductive empirical research (Markman & Krasue, 2014), or case study approaches (Pagell & Wu, 2009). (Wells, 1993) argues that over-reliance on quantitative methods hampers the theoretical framework development process, since qualitative methods may do an in-depth analysis of a problem through an inductive process.

A qualitative study was done in St. Luke's Hospital in northeastern Minnesota and northwest Wisconsin, using semi-structured interviews aimed to assess food management and services indicated that there is limited guidance detailing how hospitals should interpret and implement best practices; gain support from their consumers and administrators; prioritize various components of sustainable food systems; find new suppliers, or evaluate the return on investment. It emphasized the need to study key individual, institutional, and community influences on the implementation of healthy and sustainable food systems that need to be conducted and disseminated. (Dauner et al., 2011)

Another qualitative research, done on practical sense of sustainability in primary health care projects implemented by over 30 non-governmental organizations world-wide found out that even if the NGOs are familiar with the concept of sustainability they were challenged with the implementation in the reality. They emphasize the importance of doing qualitative research as it helped them to make sense of sustainability in the field. (Sarriot et al., 2004)

A study used a mixed approach to identify an indicator for sustainability aims to provide quantitative metrics in which it provides a means to measure the performance whereas the qualitative terms give information in what it requires in terms of changing or reinforcing established rules, norms, and values.(Scerri & James, 2010)

In similar research by M. Billing (2016) which aims to contribute to a better understanding of corporate sustainability collected data through in-depth interviews. They found that the implementation of sustainability is through informal nature and the major motivation of corporate is profitability while the social effects were mostly revealed through improving working conditions and the environmental impact is perceived as a means of reducing consumption of limited resources, and more efficient use of material and energy.(Billing, 2016)

Furthermore, Kang, Yang, Park, & Huo, 2018 in their research also validated the problem of sustainability management in supply chains to include poor sustainability management practices in the supply chains of organizations which lead to disappointing sustainability performance and there opined the importance of ensuring that there are adequate measures to effectively implement sustainable management practices that will achieve the desired overall sustainability performance in a supply chain.

van Lakerveld & van Tulder, 2017 in their reviews of papers on relevant practices on how to implement sustainable supply chain management suggest that questions can best be organized by focusing on ensuring the organization's determination for with sustainability regulations, ensuring that its internal processes and procedures are aligned with sustainability practices.

2.3.Conceptual framework

The basis of this conceptual framework is adapted from (Duque-Uribe, Sarache, & Gutiérrez, 2019) in which it summaries SSCM practices. It is based on a broad literature review that permits to lay down a clear path toward empirical validation and managerial implications of practice implementation. Different components are related to internal supply chains, such as procurement, warehousing, and inventory, and transportation distribution management are placed at the center. Hospital logistic fields such as food; energy; water and waste management with strategic management and leadership; as well as information flow and technology management are crucial components of the framework. The study aims to assess the current status of sustainable supply chain management practices of Black Lion Specialized Hospital. But the study is only limited to internal factors and perspectives from employers of BLSH considering all the factors would be very complex.

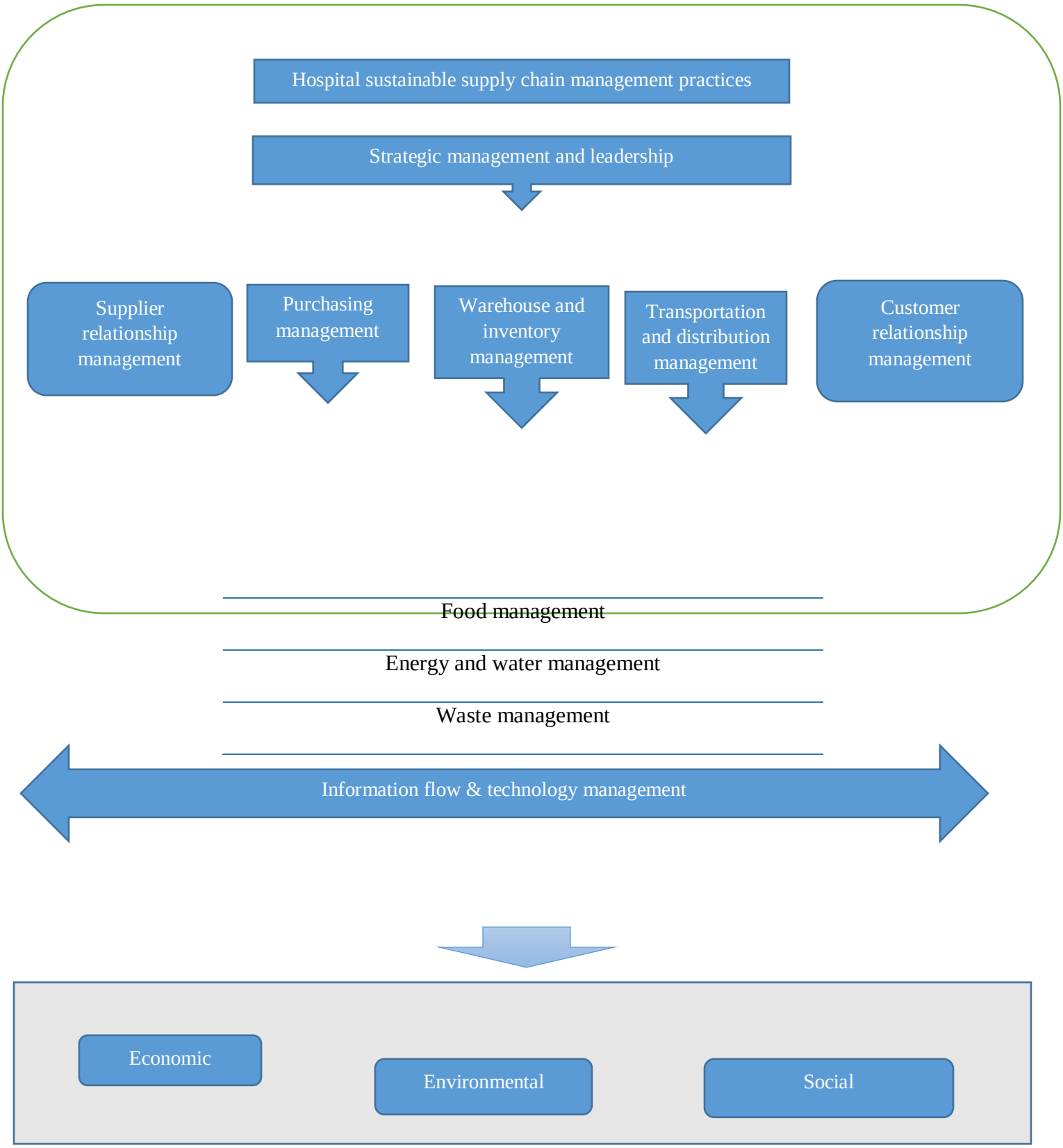

Figure 1: a conceptual framework for hospital SSCM

CHAPTER THREE: RESEARCH METHODOLOGY

3.1. Study setting

The study was conducted in Black Lion Specialized Hospital (BLSH), located in Lideta Sub City, Addis Ababa, Ethiopia. BLSH is the leading referral teaching hospital run by AAU. The hospital has 850 beds for pediatric and adult inpatients. The hospital is one of the largest public hospitals in the country providing services such as outpatient andInpatient services, TB treatment, Pediatrics treatment, Internal Medicine,Gynecology/Obstetrics, Delivery services, Family Planning, HIV testing and treatment, Neonatal ICU, Emergency Service, Neurosurgery, General Surgery, ICU, 24hour laboratory, 24-hour pharmacy, 24 Radiology, Community Pharmacy.

3.2. Study Design

A qualitative exploratory design with in-depth interview and observation filed notes methods was used to gain insights into sustainable hospital supply chain management practices concerning economic, social, and environmental dimensions. Where exploratory studies are a valuable means of understanding what is happening; to seek new insights; to ask questions and to assess phenomenon. (Shaban, 2009)The qualitative approach emphasizes processes and meanings that are not measured in terms of quantity, amount, intensity, or frequency. The qualitative approach provides a deeper understanding of the phenomenon within the context (Guba & Lincoln, 1994). Qualitative research involves conducting interviews during the explanatory stage of a research project to uncover factors that are the root of the problem. The interviews aimed to uncover new qualitative information rather than gather quantifiable results. For this reason, open-ended exploratory interviews were used to stimulate respondents to share their thoughts and feelings.

3.3.Research strategy

A case study is defined by **Robson (2002),**as a strategy for doing research which involves an empirical investigation of a specific contemporary phenomenon within its real-life context using multiple sources of evidence. **Saunders et al. (2000)** define a case study as the progress in detailed, intensive knowledge about a single case, or a small number of related cases. A case study is a detailed study based on the observation of the intrinsic details of individuals or organizations. The case study approach has considerable ability to generate answers to the questions `why` as well as `what`and `how`

3.4.**Study participants' recruitment**

Participants were purposefully recruited considering particular knowledge about the sustainable hospital supply chain management practices.Senior officers working in management, technical staff, and clinicians were included in the study, and a cluster of interview questions was arranged as per their responsibility of the participant in the hospital.

3.5.Study population & Sample size

The number of study participants was determined when the information gathered to reach a saturation point. The saturation point is the point where there won't be any further new evidence or additional information (John, 2012). The saturation point was obtained when the 15^{th} participant was interviewed but the extra three participants were interviewed to determine its true saturation point and no further information can no longer be obtained.

3.6.Interview methods

Data collection was carried out by the principal investigator using an in-depth interview while field notes were taken in the interview settings, study participants' nonverbal messages, and any other relevant issue was noted. The interview ranges from 25 to 45 minutes and an average of 28 minutes interview was carried out in a private area where there is no noise and disturbance. The location to conduct the interviews was selected based on mutual agreement with the study participants.

The interview guides are first established in English then translated to Amharic. The English version of the interview guide was translated to Amharic and back to English to check for consistency. They are made of a number of open-ended questions to elaborate and probe participant's thoughts regarding SHSCM(Annex I). They were tailored to each respondent (eg, administrator, lower managerial staff).

The data was audio-recorded and transcribed verbatim Microsoft (MS) Word. Field notes taken during an in-depth interview were used to augment interview responses. The transcribed interview and field note data was analyzed using the thematic approach. Data were analyzed using qualitative software (Nvivio 12) to identify; code; and categorize patterns and themes and then reduce the overall number of themes by selecting, ordering, and clustering them. Data analysis was carried out simultaneously with interviews as in a qualitative study; such analysis was used to guide further data collection and finally to attain saturation of themes.

3.7.Data quality

The investigator used an interview guide extracted from published literature. Furthermore, the investigator took detailed field notes and used an audio recorder with the consent of the study

participants that enhance the reliability of the interviews. The findings of the study were presented in the form of rich descriptions to allow the audiences to make decisions regarding transferability. A summary of the major findings was presented back to participants all of whom concurred.

3.8.Ethical Consideration

A formal letter was written to the hospital from the Department of logistics and supply chain management and prior permission was obtained to conduct the study. Permission was also sought and obtained from staff members working at the hospital. Finally participants were provided with adequate information about the study and their involvement before being interviewed. The confidentiality and anonymity of participants were maintained throughout the study period and during report writing**.**

CHAPTER FOUR: RESULT AND DISCUSSION

4.1. Introduction

This chapter consists of two sections which are result and discussions. The first parts presents description of the study participants and key themes emerged from the interview. The second part is discussion were major findings from Black lion specialized hospital are presented with context of current practices of sustainable hospital supply chain management worldwide.

4.2.Results

4.2.1. Description of study participants

A total of eighteen participants were involved in an in-depth interview. This included the assistant clinical service director, pharmacy director, IT manager and 2 officers, 2 store managers, 2 transport unit staff, 1 outpatient pharmacy team leader, 2 clinician, 2 procurement team member, 2 academician, and 3 drug supply chain team members.

Table 1: Description of study participants

Gender	**Female (3)**
	Male(15)
Age	**20-30(2)**
	30-40(12)
	>40(4)
Year of	**1-5(2)**

	5-10(13)
	>10(3)

4.2.2. Key Themes of the Interviews

From the analysis six themesemerged which are (i) Environmental, (ii) Transport and distribution, (iii) Finance and supply, (IV) Human resource, (I) infrastructure, and (VI)Relationships. Each theme is further classified into sub-themes as shown in the table below.

Table 2: Key themes of the interview

Themes	Sub-themes
Environmental	Energy and waste management Water and food management
Human resource	Competency Continues professional development Monitoring and Evaluation
Relationship	Collaboration Conflicts

Transpiration and distribution	
Finance and supply	Procurement
Infrastructure	Building System

1. **<u>Environmental</u>**

The concept of green supply chain management and considering environmental dimension while procurement is not well known in BLSH. As the participant described it:

"Green supply chain management is totally in the infant stage. It is better to say it doesn't exist."(7 year, Participant 4)

"Where you cannot accesses the medicine you won't be bothered about its environmental consequences. For us thinking about the environmental dimension of the supply chain is like a luxury."(6 years, participant 8)

"Let alone items purchased through tender, we don't even check whether the items we purchase from EPSA are environmentally friendly or not."(4 years, participant 1)

Energy and waste management

BLSH is taking its role to reduce energy consumption by incorporating simple practice in the daily activity of working and one of these activities is switching the light off when not needed. It had

been also using steam energy as means of energy source for more than a decade which shows its intention for using alternative energy means.

"To save energy and for security, we as a habit turn off lights when we leave our offices. No one goes out without turning off light in the pharmacy. Unless they are working for 24 hours and it is must to keep the light on, it will be turned off." (5 years, participant 17)

"There is steam. This steam generated from fuel or coal. There is a big house in the basement that generates steam. Then the energy is used for the kitchen and other parts of the hospital. I am not sure how functional it is to this date.''(6 years, participant 2)

Waste management had been a headache for BLSH. Expired drugs are left locked in a room for more than 5 years. Infectious waste materials and chemicals requiring special disposal are incinerated without taking the necessary precautions. Some leftovers of hazardous chemicals such as anti-cancers are getting disposed of within the institution by burning.

The study participants describe this:

"There is a problem of disposing of waste without separating it first. For example, anti-cancer medication has a disposal system. But, especially after it is distributed to nurses, it is mixed with other wastes and disposed of. It's known that many wastes are eliminated through incineration. Some toxic drugs are mixed and eliminated this way." (3 years, participant 16)

"For the past 5 years expiry products are not being disposed and we don't know for how long this will last. There are newly finished disposal units in Hawassa and Adama. But they haven't started giving services. What we are currently doing is we register and audit the product from every dispensary unit according to the standard and notify the finance office about it. We then pack and put them in the room." (7 years, participant 4))

"It will affect the ecology, it contaminates the underground water, and even animals and people in the area are exposed to it. These things create a significant problem in the environment."(9 years, participant 10)

As reported from the study participant, BLSH has tried to dispose of the waste material through different methods such as; reuse or redistribution of unwanted, surplus materials; incineration, and water treatment. Unwanted pieces of metals are sold for recycling purposes. It remains a challenge to dispose of a large amount of waste since the law doesn't allow a government institution to dispose of a product the value of more than 100,000birr. They are also installing an information system for the entire hospital to achieve a paper-free system in the nearby future.

"Liquid wastes are treated before they enter to municipality and sewerage. They are treated since they can be infectious."(5 years, participant 3)

"According to the law of the country it is forbidden to dispose of items that cost more than 100,000 birrs from a government facility, which has its pressures, such as forcing items to be put in an area for a longer time. It also makes them vulnerable to injury and theft. The agency that is responsible for the disposal of this property disposes of it when the proper audit and documentation is complete." (10 years, participant 11)

Water and food management

Food supplies are bought from suppliers by open tender annually. Detail specification of the product needed was used in the tender document. While the quality of the product supplied is checked each time at the delivery of the product by the quality improvement of staff members. The hospital has arranged to work with small, local vendors with specified foods such as enjera as this is also the government strategy to support small suppliers.

"There is an annual tender for meal providers. Raw materials are purchased based on the tender. They only provide the raw material, the cooking is done here in the hospital. Only cleaning service and security are the ones outsourced."(11 years, participant 5)

"One of the governments' strategies is to support low-class suppliers but the tender is big am not sure if it includes them. But what I know until now is only big companies are the suppliers. I am not sure but I think low-class suppliers supply enjera." (6 years, participant 9)

Water is supplied by Addis Ababa water and sewerage authority. They have managed to install two water canal where one of the canals is used as a backup source of water. The hospital is experiencing a problem with the water pump because it doesn't reach the floors above the 5th floor.

"The water pump came from two directions so one can serve as a backup. The hospital also has a tanker." (7 years, participant 4)

"There is no water for example we had trouble pumping water above the 4th and 5th floor. The pump has to be replaced. There is no water above the 5thfloor so water is kept in containers. There is no groundwater being generated."(5 years, participant 17)

2. **<u>Finance and Supply</u>**

BLSH spends a large amount of budget to provide services, build infrastructures, and supply pharmaceuticals to the community. As the participant described, the inefficient credit and cash collecting system is dragging the hospital to the ground. This resulted in the hospital to collapse financially year after year as its reimbursement strategies are failed. This is described by the respondents as written below:

"It is difficult for the Diagnostic center to work since most patients are credit there is no enough budget. 80% of MRI service is given to credit patients so it is difficult to match the budget with the service."(6 years, participant 8)

The higher officials promised to permit the hospital to earn its income 60 years ago. Yet the hospital strives to survive. They reported on the national TV that BLSH has 280 million birr dept. Where will we get the money to pay this? (10 years, participant 11)

"When we see it as a government hospital, it is difficult to say the money will be reused for other purposes because the reimbursement policy is not good, especially since the majority of patients hospitalized are credit patients and are people from all over Ethiopia." (7 years, participant 12)

Procurement

The procurement process of pharmaceutical, equipment as well as other products were well described below. Even if green procurement is not considered through the process other essential strategies such as bulk purchase, standardization, and open tenders are used to get a competitive advantage. The hospital has developed standard treatment guideline and drug list which that get updated every year. By referring list forecasting is done. The procurement team collects requests from a different department which involves clinicians and biomedical teams.

"The procurement team discuses with the clinician and the biomedical team and gathers enough information and specification about the product and set criteria." (12 years, participant 7)

"Usually when we purchase laboratory reagents that are ISO certified."(11 years, participant 5)

"Anything outside of the guideline will be updated when necessary. According to that, it will be eligible for quantification."(6 years, participant 8)

"First we request all items from the drug list then we ask every department to tell us what they request and they will submit it through a letter. For the orthopedics department, internal medicine, gynecology, pediatrics, and oncology, it has its purchaser and its ministry of health. Based on the request of the departments, we will do need assessment and then we will send the letter to EPSA. EPSA will give us what they have from the list and the rest is usually purchased using open tender." (7 years, participant 4)

"There are three ways in which medicines and medical supplies are supplied. One is through the program, this includes ART, TB, OI, malaria, and family planning. The second is through donation and third is through RDF. In RDF it is could be by purchase or by contractual agreement but both are types of purchase. The purchase may be done in different ways. It might be by restricted tender or by Performa." (6 years, participant 8)

"In many cases installations and maintenance services are provided by the supplier together with the procurement based on the contract, which has its expiration date. Until then, the facility will get the service it needs from the provider." (10 years, participants 11)

Other than the governmental supplier (EPSA), the hospital tried to enter into a contractual agreement with private suppliers but it didn't succeed. One of the many reasons mentioned by the participants was the inability of suppliers to stick with their agreement. The market price fluctuations took a large part in the failure of their contracts. Even if EPSA couldn't fill the hospital demand it is still a preferred supplier to the hospital and here is the reason why:

"EPSA is comparatively good since it is governmental. Since it is a governmental organization, it is trusted. There won't be issues related to counterfeit. Other purchases made are strict and are

based on the requested specification and issues related to quality is checked in the pharmacovigilance center after we have received the items." (6 years, participant 9)

"But when it is at the central level since the tender is international and based on our requested specification, when we purchase from EPSA we are only concerned with selecting the items and all the logistics are controlled by EPSA." (5 years, participant 17)

"A lot is known about the market fluctuation of the country. Since it is difficult to predict the market value after a year or six months, it is difficult to get a private supplier. So we ended up in purchasing items through Performa or restricted tender."(6 years, participant 9)

"It is difficult to reimburse money from the patients since the set-up is not convenient. More work is being done on availing health insurance so that the money can be reimbursed by working with them."(10 years, participant 11)

3. **<u>Human resources</u>**

One thing is for sure in BLSH, which is it has a large human capacity. Yet as the respondent said it is one of the areas of resource where the hospital didn't use efficiently. Here is how one of the respondents described it:

"BLSH has a large number of employees now it is integrated with the college of health sciences it has academicians as well but I tell you this; if you go to the institution you won't get half of the employees in their working place." (9 years, participant 10)

The drug supply chain management team is well established and functioned but this is only for pharmaceuticals supply chain other products supply chain management is not well organized.

We have a case team called the drug supply management team which has 10 staff members under it. By the way the team is not small. It has 2 purchases, around 6 store men and one assistant case team leader under it that leads the team.(11 years, participant 5)

Managerial commitment is also one of the areas raised that needs to improve. A manager should motivate its staff, a manager should lead his/her employees, and a manager should be a decision-maker. These are the lists mentioned by the respondent as what the manager lacks.

"Commitment of management first then comes resource it can be in terms of money, but the major thing is commitment." (6 years, participant 9)

"No one cares about the supply chain as long as there is a service and the moment you got out of stock then they start nagging about it as if it is something you can do overnight. They don't give enough emphasis on supply chain management."(7 years, participant 12)

"No one from top management has commitment. Because it takes lots of work to apply an information system."(3 years, participant 16)

So the management theoretically has certain things but no one has created a feeling of ownership to the staff. If you fail to create this feeling the staff will act negligently at their work. Secondly the upper-level administrative need to know what the staffs need. They do not engage them. (12 years, participant 7)

Competency

One of the issues raised as a concern from the participants is the issue of experience. Young professionals take a managerial position soon after their graduation. Some don't understand the system and the communication skills it needs to manage a huge hospital-like BLSH. In contrast to

this, some of the issues raised from the IT department was that older employees couldn't cop up with technologies and information system.

"You can't rule a country as soon as you finish school even if you are educated, life itself is a university." (13 years, participant 6)

Ministry of health is being run by kids. They are not experienced and they are people of the previous government. It is difficult for me to believe that they are skilled people. (7 years, participant 12)

"You know when you push something and after you stop it is still moved until some point. That is how BLSH is moving right now. The past administration has pushed it as much as they can but now, it is not being led properly. But it will fail at some point." (7 years, participant 4)

Continuous professional development

The hospital has assessed its challenge and working hard to overcome this and one of the strategies was to educate and develop its staff. While this initiation is good the staff have some compliant regarding this; which is the issue of preference while the hospital gives different learning opportunities, most of them are based on the hospital need. This is described as below:

"So I want to be neurologist but the hospital wants me to be a surgeon. So I have to wait another year to come for me to learn what I want." (12 years, participant 7)

"Currently 7 or 8 people are taking supply chain courses. The reason is that we have identified the gap to be on the supply chain. So we think we will fill that gap. There is no habit of hiring supply chain graduates. Many of them are purchasers. There is no supply chain professional recruitment." (7 years, participant 4)

Monitoring and evaluation

Each department is organized hierarchal way and performance is assessed each week. Customer satisfaction is assessed through surveys and feedback from the community is collected quarterly throughout the year.

"A customer satisfaction survey is done. The quality department surveys customer satisfaction every 2-3 months. Secondly, there is a good governance office. That office follows different problems we encounter and gives the solutions. There is another office called compliant collecting office. Complaints are resolved in this office." (6 years, participant 8)

"Fourthly there are meetings held with the community quarterly. The meeting is about the perception of the community in the hospital. Feedbacks are given but the problem is the meetings are not continuously held as planned. Solutions have to be given to the feedback so action plans are prepared based on the comments given. It will be implemented based on the action plan then what was implemented will be checked." (9 years, participant 10)

"Every unit has a case team under its directorate. And every case team has its department. We had a meeting every Thursday to talk about what should be done and who needs to work on what. we had different opportunities when we used to meet and discuss." (6 years, participant 2)

"We examine and set a direction to the issues that arise. But if we set the goals, there are issues that we can't decide alone but with the ministers." (5 years, participant 3)

Currently there is no. they thought we would be able to see EPSAs stock but we can't see their stock. We will call them and they will send us an actual report on stock out items.

We have which we report weekly. We send them items that are stock out. It is not linked with the system, it would have been helpful if it was. The upper administration doesn't give place for this but they complain when medicine is stock out.

4. Infrastructure

Even if BLSH is a huge hospital with a number of buildings the fact that the main hospital building is old and not equipped with the necessary materials raises concerns from the employees. The shortage of beds, pharmaceuticals, and ICU resulted in the hospital to have a high number of waiting list while the physicians are staying unoccupied.

"After they get admitted there won't be a bed available . . . There is no supply of medicine for treatment for example when you send them outside of the hospital to buy antibiotics, there are times it will be expensive for them." (13 years, participant 6)

"The ICU is very small. In this ICU, it is like giving one bed for 1000 people. The waiting list for surgery is very huge. I remember we say there are 300 patients on the waiting list. It might take a year to operate on those 300 patient but the patient might need the surgery very soon."*(9 years, participant 10)*

Building

While clinicians are complaining about the absence of office and workspace. Some argue that the academicians and the clinicians are taking space and locked the office for two or more months while they are on sabbatical leave. The IT guys propose a solution for this, he recommends virtual consulting with patients: no need to be physically present. Here is how it went:

"I don't think the hospital design is up to standard. The nursing and doctors' units are not equipped with accommodation areas. The Outpatient Pharmacy Dispensing Unit has been reconstructed recently to help facilitate services given to patients. However, other pharmacy units still occupy a crowded area."(7 years, participant 4)

"There is no toilet in the black lion both for staff and the patients."(6 years, participant 2)

*"They give 2*2 rooms for a pharmacy which is 28 cube. It's funny giving 28 cubes in a hospital with more than 300 beds. When it was being designed no one consulted us but all the clinicians already have chosen offices before the construction. But when you see it as an organization priority must have been given to workspaces than offices."(6 years, participant 14)*

"Pharmacists know about the patient logistics but because of the setup, they are unable to do so. Normally one unit is only able to serve only one patient. So it is difficult to say there is patient logistics." (5 years, participant 17)

"The workplace is a little uncomfortable. When we start talking about the offices, most people don't even have an office. There may be 8-10 doctors in a very narrow room. Now that Black Lion is a teaching hospital, it does not fit with the academic work." (9 years, participant 10)

System

The hospital is using a different type of information system in different departments. The fact that it is not integrated results a cumbersome problem to the staff because they couldn't along with each other. As the respondent mentioned, the reason for using different information systems is because most of them are owned by external bodies/partners. Not only this brings difficulty regarding integrating the system since it is visible and accessible to external bodies major receipt and authenticated papers couldn't be print out from the system.

"I haven't told you about it but we have our database called HCMIS (health commodity management information system). It has its receiving, issue, and expiry date entry method, it also shows total cost, near expiry, and the overall trend of a specific medicine. There are two programs in the dispensing unit. One is the APTS system set by the ministry of health and the other is the HCMIS system. We are trying to integrate and link these two and made dispensary units send information to the store and from store to dispensary via the system." (10 years, participant 11)

The time consuming manual work there was in the warehouse now has been resolved. In previous years we use to list out the medicine that arrives manually, but now we still haven't started giving models It has model feature but the problem is the hospital doesn't own it 3rd body incorporate it. It is still a problem to include financial receipts in the system.

"when a patient comes to the reception he/she only needs to have the ICARE card then information is sent to the doctor and the pharmacy via the system and the patient is served accordingly."(5 years, participant 17)

"It is externally owned. Currently the program office controls it because they don't want to lose it. In previous years for example, when we have new lists, we have to wait for them to add and delete the lists because we can't easily customize it. Again if it could be integrated with all pharmacy units, it is manual. Things can be done simultaneously to overcome the problem but the management is not supportive."(11 years, participant 5)

5. Relationship

As BLSH is a public hospital it works with different stakeholders and partners. While some have good relationships the others end up in conflicts.

Collaboration

Of these relationships, some of them wind up with fruitful outcomes such as working as a team for a common goal and engaging staff with mutual training. This is how they described their experience regarding this:

"In collaboration with the NGO, we have trained about 60 employees in the Health commodity supply chain management."(9 years, participant 10)

"We are working in a team together with the school of pharmacy to get our staff competent and educated."(7 years, participant 12)

"when EPSA, ministry of health and Addis Ababa health bureau prepare training on the supply chain, they update us and train our staff. This is how we work".(7 years, participant 4)

To do this, we check the weekly stock status of the hospital and update it especially for medicines that are vital in collaboration with the concerned body. We exchange reports to let them know the status. When it nationally, we update EPSA, ministry of health, Addis Ababa health bureau and other concerned body about our stock status every 15 days

Our relationship with our suppliers is bound by the contract.

Conflicts

Conflicts arise here and then from the staff as well as form the external bodies. One of the issues raised was the environmental contamination. The other conflict was with suppliers when a supplier fails to adhere to the contracts which turn out to have a legal consequence. Sometimes they cannot do anything about it other than complaining because it is with the higher officials.

"The issue we are facing after signing a contractual agreement is supplied. They don't want to supply because there is a price increment in the item. If they tend to profit more out of this, they

will be out of the game. If the contract is broken, there are legal ways to handle it" (9 years, participant 10)

"To you're amazement, there were complaints from the people around saying it is polluting the environment." (10 years, participant 11)

"Ministry of health doesn't have a good view of Black lion they give more emphasis to St. Paul hospital since it is theirs. They want its name to be called. They tend to say they don't care because Black Lion is the university's hospital." (12 years, participant 7)

"During the time I was a director, St. Paul's budget was added by 57% while Black lion added budget was 7%. It has more than 2000 students, around 5 schools, and approximately 1000 academic staff." (13 years, participant 6)

6. Transportation and delivery

Some products are delivered by their suppliers such as program medicines from EPSA. The challenges remains when products are out of stock from the supplier's side and the hospital has to pick small packages of product. The hospital doesn't have enough vehicles and sometimes it's not suitable to transport pharmaceuticals that need special handling. Using buses to saves energy and resources is also one of the strength mentioned in the transportation system of the hospital as the staff can use the public transport that is provided by the government for free.

"*There is a problem with transportation in this hospital. There is no transportation system assigned for pharmacy. Handling might be uncomfortable: if the items are not delivered by the EPSA delivery system our vehicles make the medicines prone to rain and sunlight. We have to beg them even to get the vehicle since everyone uses this one vehicle." (5 years, participant 17)*

"The hospital uses shifts, for example, if it transports supply today, it will be pharmaceutical tomorrow."(9 years, participant 18)

"we have branches in Hawassa, and Gondar where we exchange and re-distribute medicines. If there is overstock somewhere in the country, we use this method to overcome unavailability in other areas."(6 years, participant 9)

"We don't have cold chain transport system, we use cold boxes. We only have one ISUZU so it is challenging. If this one ISUZU gets tore, we are left bare handed. We have decided to add another by noticing it is cost ineffective to outsource." (6 years, participant 9)

"But since EPSA don't have medicine in bulk, if we request for 100 and they give us only 30 now and 30 in the next, it means we will go back 3 times to get it."(7 years, participant 12)

4.2.Discussion

Inappropriate disposal of waste is a major problem viewed in this study. This has not been only BLSH problem, a study done in South Africa, in waste management practices revealed that; the hospital does not adhere with the standards of waste management especially separation and segregation of wastes into different categories such as infectious and non-infectious medical wastes are not well-practiced (Abor, 2010). The same is true in Ghana, were medical waste-sorting and management are assessed, found weak management, and cross-contamination of hospital generated wastes when using open-fire pits and substandard incinerators for burning infectious waste (Adu, Gyasi, Essumang, & Otabil, 2020). A Nigerian study shows an improved waste management practice after creating awareness in an intervention program. (Awodele, Adewoye, & Oparah, 2016)

While BLSH facesa challenge in disposing of wastes through the incarnation, it has found its way to re-cycle wastes and sale some products for re-use purposes. Recycling is advantageous because its economically efficient as it can generate some income and it had been supported and recommended by WHO (Health & Regional, 2017). The concept of environmental sustainability in health care is not bound only to reducing energy consumption and waste management it extends to green procurement. The best way of avoiding waste is to consider its disposal before procurement(National institute of health, 2011).

Another way of achieving SHSCM is by influencing suppliers to considers environmental impacts and procuring environmentally friendly products such as recycled materials, low-energy consuming products, environmentally sustainable packaging, and transport (Health & Regional, 2017). This can be a good strategy where a bulk purchase is made in a centralized way like the Ethiopian pharmaceutical supply chain. Where the buyer can have negotiation power. Of course, this needs managerial commitment.

Lack of managerial commitment from senior management health facilities is also reported in Australian study which acts as a barrier for the successful implementation of SHSCM(Ahsan & Rahman, 2017).In this study, managerial commitment to implement SHSCM raised as a challenge, Getaneh also evaluate good governance activity in BLSH found similar findings; the managers don't engage employees, different stakeholders in decision makings and it have week customer handling (Getaneh, 2019). To implement SHSCM it is essential that sustainability is considered as a value at the highest level of organizations and that it forms part of the mission and vision of each organization's sustainability policies, using tools such as charts and codes of conduct, and training people. (Fritz, 2013)

One of the areas that didn't get enough attention is water and sanitation. Well managed water supply will have a positive outcome both indoor and outdoor environmental conditions (Saad, 2007). BLSH has managed to treat water that flows to sewerage but stills failed to avail water on all floors of the hospital.

The uncomfortable environment in BLSH has made the staff disappointed, a similar finding is reported by Tesfaye who assessed health care professionals' satisfaction in BLSH in ED reported that health care professionals are dissatisfied with low monthly income as well as the hospital workplace(Tesfaye, 2019).

As BLSH is the largest referral hospital in Ethiopia, it has to work with different stakeholders as well as build intra-organization relationships. The relationship inside the hospital reported as infrequent collaborative behavior in the overall Nurse physician collaboration scale (Tsegay, 2015). Not all relationships end up in collaboration, sometimes conflicts arise and this is observed with different partners. It is better to customize relationships with their relative importance and distribution of power because when there is an asymmetric power relationship the relations will be mostly like get abused and result in damages to one party. (Harvey & Speier, 2000) By prioritizing organization goals it's better to step aside conflicts and work for common objectives with different partners. Health care managers have an ethical responsibility to design and implement strategies and initiatives to build healthy relationships with the community as well as other partners to achieve their goals. (Bottero et al., 2015)

BLSH is giving tremendous service to the community, facilitate collaboration, and collecting feedback quarterly. This is considered as one of the ways of achieving social sustainability by creating accessible, integrated, and equitable services and meeting the user's health needs. (Bottero et al., 2015)

As a teaching hospital, BLSH is giving different opportunities for its staff to build an educated community. One of the strategies used was training and post-graduate classes. A study done in Ethiopian pharmaceutical supply agency shows that training of employees resulted in good procurement practice (Berhie, 2017).

The hospital is not self-administered regarding financially. Some of the participants recommend the autonomy of the hospital as they consider it'scaused the hospital to be trapped in a large number of loans and debts. Findings from different studies suggested that policies granting autonomy have had limited success (De Geyndt, 2017). Even if hospital autonomy had led to better human resource management and utilization there is no guarantee that it can automatically lead to system efficiency (McPake, Hanson, & Lake, 1999). One of the strategies Ethiopia planned to deploy is universal health coverage through health insurance. This might help hospitals to stand up by themselves and protect financial hardship (Lavers, 2019).

Lack of infrastructure had resulted in overcrowding of the hospital and unable to manage patient logistics. Information systems have contributed a lot to inventory management, patient recording system, and finance. An unintegrated information system has resulted to print out prescriptions and data's to move to the next department. This had been reported by Tefera G &Messele., as HCMIS have improved the warehouse and inventory management but system ownership and unintegrated information system remains to be a challenge (Tefera & Messele, 2020)

BLSH faces a shortage of suitable transport means, only one vehicle is currently used for transportation of goods and pharmaceuticals. The hospital uses public transportation for its employees which can be seen as one way of saving energy where a large number of people use one bus but still, there is a space for improvement in cold chain management and pharmaceuticals transportation. The use of inappropriate storage was also observed in other countries, a study done

in Thai hospitals reported that 46.7%-72% of delivery of cold chain products without controlled temperature boxes (Sooksriwong & Bussaparoek, 2009).

CHAPTER FIVE: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents conclusion and recommendation based on the result obtained from thematic analysis and the areas where the hospital can improve and further studies could be done.

5.1.Summary

BLSH is on early stage of environmentally sustainable supply chain while trying to use many means to reduce energy consumption yet it have to work hard in its waste management practice. The finiancial instability caused by poor cash collecting system is one of the challenge of economical sustainability for the hospital to grow and fulfill its goal. While different techniques such as consolidation, standardization and bulk purchase have been used as cost saving strategies the hospital should consider alternative means to be encomical sustainable. The hospital engage its employees in different professional development programs such as post-graduate class as well as different traings however the employess are not satisfied with the current work environment.

5.2.Conclusion

The research aimed to assess the current sustainable hospital supply chain management practice in BLSH concerning the three dimensions of SHSCM which economic, environmental, and social perspectives. Generally speaking, some of the sustainable hospital supply chain management practices are implemented in BLSH without putting them as a strategy. But environmental sustainability didn’t get enough attention and since the three dimensions of sustainability are interlinked the problem raised from an environmental perspective is resulting in social concerns from the community. The hospital doesn’t consider environmental issues while procurement as well as have weak waste management practice.

The in-depth interviews showed that the hospital is currently suffering from the currentcash collecting andcredit system.Resulting in the hospital to face financial problems. The information management system is used within the different departments of the hospital yet lack of integration between the systems is causing the hospital to be inefficiency. The hospital hasemphasized to build competent human resources by giving different opportunities to continue their education.Hospital staffs are not satisfied with the current work environment due to the lack of infrastructure and workspace within the building. The hospital tries to build a good relationship with different stakeholders, partners, and communities however sometimes it faces conflicts and misunderstanding.

5.3. Recommendation

- ☞ It's better if the hospital puts sustainable hospital supply chain management practice as one of its mission and plan to act on it. In this way, it can monitor and measure performance according to the action plan.
- ☞ Relationships with external stakeholders and partners should be strengthened and the hospital should use strategic relationship management.
- ☞ Even if the hospital is taking an alternative way to supply energy yet it has to consider a sustainable source of energy since it is a huge hospital and consumesa large amount of energy.
- ☞ As one of the responsibilities of the hospital is the protection of the environment through corporate social responsibility. It should consider taking part in creating an environmentally sustainable community by improving waste disposal methods and creating awareness regarding waste management with employees.

- ☞ The hospital should find a way to be economically sustainable as well as build a comfortable environment for the employees.

5.4.Limitation of the research

The first limit is connected with our interview method. Even if we proposed to do face to face interview due to COVID 19 pandemic most of the interviews were done through phone call. Another limitation lies in the interviewees, we thought we could get lots of participants directly involved in the SHSCM but again we interviewed managers and administrative staff. Further research could be done by involving quantitative and external factors.

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Annex

Assessment of sustainable hospital supply chain management practices-The case of Black Lion Specialized Hospital, Addis Ababa University

<table>
<tr><td colspan="5">PART 1: Details</td></tr>
<tr><td colspan="5">Date:</td></tr>
<tr><td colspan="2">Years of stay in the institution :</td><td>Participant #</td><td colspan="2">Interviewer</td></tr>
<tr><td>Sex of Participants:</td><td>F</td><td>M</td><td>Start Time:</td><td></td></tr>
<tr><td colspan="2">Age Group of Participants: 20-25</td><td>>25</td><td>End Time:</td><td></td></tr>
<tr><td colspan="5">Introduction and Consent</td></tr>
<tr><td colspan="5">Hello and thank you for taking the time to be here.
The purpose of this conversation is to contribute in understanding of the practice of sustainable hospital supply chain management in Black Lion Specialized Hospital, Addis Ababa University. I will interview different staffs of the hospital according to their position & responsibility. This research will help to find opportunities for improvement as well as good practices that already exists to strengthen for the future. The name of the participants will not be asked or used during the in-depth interview and in the analysis so the anonymity of the participants will be kept. Your participation here is completely voluntary, and if at any point you would like to leave or do not want to answer questions that is absolutely your choice. Also, the information will be completely confidential and not shared with anybody in a way that specific respondents can be identified.</td></tr>
</table>

The outcomes of this research will be presented to an audience for MSc thesis defense as well as will be communicated back to the hospital.

At every point, give participants a chance to ask any further clarification.

At the end of the explanation, clearly seek verbal consent from the participants for their voluntary participation and the interviewer will record the discussion.

Questionnaier

PART 2: interview questions

Section one: Strategic management and leadership

1. How do you establish a strategic plan for supply chain management? What is your experience with it?
    a. On establishing and controlling SCM priorities, plans, work teams, and performance measurement

        2. Have you consider developing a green and health policies and planned? If so, tell me about it?

    b. How dedicated is your organization in both human and financial resources to green initiatives?
2. Do you have executive support for supply chain management processes? Can you explain?
3. Have you ever use of indicators and measurement systems to assess total supply chain costs and performance? How do you assess the total supply chain costs?

4. Who involve in supply chain decision-making? Do you involve clinical staffs on logistics work teams?

Section two: Supplier management

1. How do you validate your suppliers? Do you have a pre-established supplier base rationalization system?
2. What is your experience regarding sharing information with suppliers related to material flow management (forecasts, planned consumption, inventory, costs, promotions, and performance)? (Could also include EPSA)
3. Have you included different dimensions of sustainable supplier arrangements like environmental, economic, and social?
4. Do you consider the selection of ISO 14000-certified suppliers? Please explain
5. What is your experience with suppliers to innovate and improve the availability of sustainable products?
6. What is your experience with the assessment of suppliers´ sustainability and ethical practices?
7. How common are knowledge sharing and transfer (improvements, special handling requirements, good practices, technical issues, management solutions, and new product planning and development) with your supplier?
8. How do you control your payments and monitor the status of your product flow (enhanced control of payments to suppliers focused on preventing delays)?

Section three: Purchasing management

1. What is your experience with supply standardization?

2. Do you use of purchasing groups/teams? How do you crate the groups? Who are involved?
3. Do you ever consider to alliances between other hospitals for the purchase of common items (aggregating purchasing volumes) to attain lower prices and avoid monopolies
4. Have you ever use of the life cycle analysis to assess the environmental impacts of procured items?
5. Do you consider the environmental and human rights impact of procured products?
6. Do you have a practice of purchasing of reusable, rather than disposable, products?
7. Do you eliminate, minimize, and substitute chemicals with safer alternatives?
8. How is your coordination between hospitals to increase buying power for economic, environmental, and ethical purposes?

Section four: Warehousing and inventory management

1. How do you determine the quantity to order and reorder points? How do you see the difference between the applications of information systems, in contrast to manual processes?
2. Do you have a collaborative arrangements with trading partners to manage inventory of functional products (non-critical medical supplies) with high and stable demand? Such as vendor-managed inventory, CPFR - collaborative planning, forecasting and replenishment, outsourcing
3. Do you use of hybrid stockless systems (high-volume products are delivered directly to points of care and low-volume products are delivered to the central store).
4. Is your store consolidated? How do you deployed centralized replenishment system for nursing units?

5. How do you deploy min-max inventory management?

Section five: Transportation and distribution management

1. How is your transportation and distribution management?
2. Do you consolidate external transport?
3. Do you promote of public transport use? How do you describe the status of public transport use within the hospital?
4. Do you use of alternative fuels and technologies?
5. Have you developed services to minimize travel (e.g., telehealth, home healthcare, and videoconferencing)?

Section six: Information and technology management

1. How do you use of information systems and technologies in interactions between hospital departments?
2. Do you have internal joint initiatives regarding product availability improvement and logistics cost reduction.
3. Have you deployed of an e-commerce system?
4. Do you use of track-and-trace systems (e.g., barcodes, Radio Frequency identification).
5. How do you collaborate among supply chain partners using pharmacy information systems?
6. Do you have automated central stores? If yes, tell me more about it?
7. Do you use of automated guided vehicle systems for the transportation of pharmaceuticals, meals, linen, waste, patient files, tests results, lab tests, blood samples, and non-stock purchases?

8. Do you have supplier relationship management system for the interaction between hospitals and their suppliers?

Section seven: Energy management

1. Do you implement initiatives for saving (e.g., conducting periodic audits, installing variable-speed drive fans for operating theatres, automatic lighting timers, and sensors, updating lighting to LED)?
2. Do you use of alternative technologies (e.g., cogeneration – combined heat and power).
3. Have you though to shifting to cleaner fuels?
4. Applying Lean Six Sigma approach to optimize a hospital linen distribution system.
5. Do you implement social marketing interventions (turning off machines, lights out when unnecessary, closing doors when possible)?

Section eight: Water management

1. Do you implement initiatives for saving (auditing usage, controlling leaks, installing flow restrictors and dual-flush toilets, use of drought-resistant plants, reclaiming water from services such as dialysis and sterilization, harvesting rainwater)?
2. Have you switched from film-based radiology to digital imaging?

Section nine: Food management

1. Do you serve locally grown and organic food?
2. How is your nutritional care pathway and standards?
3. How do you purchase sustainable products (rBGH-free, cage-free eggs, meat produced without hormones or antibiotics, certified organic and fair-trade coffee)?
4. Have you identify and working with small, local vendors to achieve healthy food goals?

5. How do you entertain foods with more sustainable choices (e.g., vegetarian meals) and those with less-sustainable options (e.g., high-fat dishes)?
6. Do you have a process to recycling (fat, oil, grease, cardboard, paper, batteries, plastic, aluminum, newspaper, and tin cans)?

Section ten: Hospital design

1. How is the hospital designed? Is it flow-through design (design for product, information, and people flow).
2. How is the nursing workstations designed? Do you see any gap for improvement?
3. Is the building built with considering sustainability criteria (using safer materials, local and regional materials, locating hospitals near public transportation routes, planting trees on-site, incorporating design components such as daylighting, natural ventilation, and green roofs)?
4. Do you apply sustainability healthcare-building assessment tools?

Section eleven: Waste management

1. How do you address overtreatment and implementing methods like social prescribing?
2. Have you developed any processes that use less material and improved technology?
3. How is your segregation?
4. Do you have any recycling of any materials you use in the hospital settings?
5. What other alternatives to incineration do you use to waste management?
6. Do you have set criteria and procedures regarding reverse logistics?
7. Take back programs of pharmaceuticals for patients and communities.
8. Applying Lean Six Sigma.

Section twelve: Staff and community behavior

1. How do you hire/train your supply chain professionals?
2. What do you do to encourage critical thinking within the community to understand, adopt and promote sustainability initiatives?
3. Do you entertain education of staff and community on sustainability? If so, how?
4. How is your joint collaboration with the community for disease prevention and environmental health?
5. How is your collaboration with stakeholders to address environmental problems and develop plans to improve sustainability?

Section thirteen: Other practices

1. Could you describe your quality management practices (quality policy, employee training, product/service design, supplier quality management, process management/operating procedures, quality data and reporting, employee relations)?

2. How is your patient flow logistics (cross-functional or cross-organizational teams, information technology support, format standardization for information sharing, meetings focused on both medical and inter-organizational integration issues, and application of lean and agile approaches)?

ክፍል 1: ዝርዝር			
ቀን:			
በመስራቤቱየቆዩበትአመታት :		የተሳታፊቁጥር፡	ቃለመጠ
የተሳታፊፆታ:	ሴ	ወ	የተጀመረ
Age Group of Participants: 20-25		>25	ያለቀበት

መግቢያእናፍቃድመቀበያ

ሰላም!! በመጀመሪያጊዜዎትንሰጥተውእዚህቦታስለተገኙአመሰግናለው።

የዚህጥናትአላማበጥቁርአንበሳልዩሆስፒታልስለዘለቂታዊየሆስፒታልአቅርቦትትስስርአመራርልምድለይየተሻለግንዛቤለመፍ

የተለያዩየሆስፒታሉሰራተኞችበዚህቃለ-መጠይቅተሳታፊሲሆኑባላቸውየስራድርሻእናሀላፊነትየተለያዩጥያቄዎችይቀርበላቸዋ

ይሄጥናትለመስራያቤቱመሻሻልያለባቸውንነገሮችለማግኘትምቹአጋጣሚየፈጥራልእንዲሁምወደፊትተጠናከረውመቀጠል

የተሳታፊዎችስምበቃለ-መጠይቅጊዜአይጠየቅምእንዲሁምበትንተናጊዜየተሳታፊማንነትአየገለፀም።በዚህጥናትየሚሳተፉት

እንዲሁምበማንኛውምሰዓትቃለ-መጠይቁንማቋረጥወይምጥያቄውንመመለስካልፈለጉመቆምምወይምጥያቄውንአለመ

የቃለ-መጠይቁሙለመረጃከትንተናበፊትሙሉበሙሉበሚስጥርየሚያዝእናየተሳታፊውማንነትበሚያስለይመልኩለማንም

የጥናቱውጤትተመልካችባለበትለድህረምረቃመሟያየሚቀርብይሆናል።

ክፍል 2: ቃለ-መጠይቅ

1. **ዘዴያዊአመራር**

1. እንዴትነውዘዴያዊእቅድለአቅርቦታትስስርአመራር (strategic plan for supply chain management) የምታወጡት? ምንድንነውያሎትልምድከዚህጋርበተያያዘ?

- ለምሳሌለአቅርቦታትስስርአመራር(SCM) ቅድሚያለሚሰጡነገሮችቅድሚያየምትሰጡት?

በዚሁጋርበተያያዘእንዴትነውእቅድየምታወጡት? በጋርየመስራቱስነገርአለወይ? አፈፃፀምንምንይህልትገመግማላችው?

2. በሆስፒታሉከአረንጓዴአቅርቦትትስስርአመራር(green supply chain management) ጋርበተያያዘያወጣችሁትፖሊሲአለ? ወይምያቀዳችሁትነገርካለ? እስቲበደንብያብራሩልኝ?

- መስራያቤቶትለአረንጓዴአቅርቦትትስስርበሰውኃይልምሆነበበጀትየተደገፈምንያህልተነሳሳሽነትአለ ው?

1. 3. በሆስፒታሉለብቻውየአቅርቦትትስስርአመራርአመራር(supply chain management) ክፍልአለ? በማንነውእስከዛሬይሄስራስትሰሩየነበረው?

4. በሆስፒታሉየአቅርቦታትስስርአጠቃላይወጪእንዲሁምሲስተሙንለመለካትምሆነለመገምገምየተደረገጥረ ትአለ? እንዴትነውይህንንእየገመግማቹሁትያላችሁት?

5. በአቅርቦትትስስሩለይውሳኔየሚሰጠውማንነው? ክሊኒካልሰራተኞችበሎጂስቲክስለይምንያህልይሳተፋሉ? በጋራየመስራቱስነገርምንያህልየተለመደነው?

አቅራቢአያያዝ (Supplier management)

1. ማንኛውንምግዜከመፈፀሞትበፊትእንዴትነውአቅራቢዎንየሚመርጡት/የሚያረጋግጡት? ቀድሞየተሰራአቅራቢዎችንየሚገመግምስነ-ስርዓትአላችሁ? እንዴትነውእስቲይህንየምታደርጉት?

2. ከአቅራቢዎቻቹሀጋርእስቲእንዴትነውስለእቃዎችእንቅስቃሴመረጃዎችንየምትጋሩት? ለምሳሌስለ

forecasts መረጃ፥ inventory እንዲሁምየ costs እና performance

የመገምገምመረጃዎችከአቅራቢዎችጋርየተለመደነው?

3. ከአቅራቢዎቾጋርየዘላቂያዌአቅርቦታትስስርሶስቱምሶሶለይስምምነትአላችው? ለምሳሌእነዚህአካባቢያዊ፥

ኢኮኖሚያዎእንዲሁምማህበራዊሁለንተናንየጠበቁእቃዎችአቅርቦታለይ?

እንዚህነገሮችንእንዴትነውየምታስኪዱዋቸው?

4. እቃዎችንምሆነፋርማሲቲካልስአቅራቢዎቻችውየISO 14000

ምስክርእንዳላቸውአቅራቢዎቻችውንበምትመርጡበትጊዜታያላችው?

እንዴትነውአቅራቢዎቻችውንየምትመርጡት?

5.

ከአቅራቢዎቻቹጋርምንአይነትልምድአለየእቃዎችንተደራሽነትእንዲሁምዘላቂነትያለውየአቅርቦትትስስርለመ

ፍጠርምንአይነትእንቅስቃሴአለ?

6. የአቅራቢዎቻችሁንዘላቂያዊነትለመገምገምምንድንነውልምድችው?

እንዲሁምአቅራቢዎቻችሁበሀቀኝነትእንደሚያገለግሉዋችውእንዴትትገመግሙታላችሁ?

7. ከአቅራቢዬቻችውጋርየመረጃእናተሞክሮልውውጥምንያህልየተለመደነው?

ለምሳሌልዬየሆነአያያዝየሚፈልጉእቃዎችለይ፥ጥሩየሆኑልምዶችንየመለዋወጡስነገር?

እንዲሁምአንዳንድቴክኒካልየሁኑነገሮችንየመለዋወጡነገርምንያህልየተለመደነው?

8. ክፍያዎችንምሆነያዘዛችሁትንእቃያለበትንሁኔታበምንአይነትመንገዶችነውየምትከታተሉት?

ለምሳሌየታዘዙእቃዎችእንዳይዘገዩምንአይነትዘዴዎችንትጠቀማላችው?

የእቃግዢአመራር (Purchasing management)

1. አቅራቢዎችንበምንመስፈርትትለካላችው?

2. የግዢቡድንአላችሁ? እንዴትነውእነዚህንቡድኖችየምታደራጅዋቸው?

ማንማንይሳተፋልእነዚህቡድኖችውስጥ?

3. ከሌሎችሆስፒታሎችጋርየጋራግዜመፈፀምአስባችውታውቃላችው?

በጋራበመግዛትየዋጋቅናሽንለማግኘት?

4.

የምትገዝዋቸውንየእቃዎችንእንዲሁምመድሃኒቶችኡደትከመጀመሪያውእስከሚወገዱደረስበአካባቢለይየ

ሚያመጡትንተፅእኖለማየትትሞክራላችው?

5.

የምትገዝዋቸውእቃዎችእንዲሁምመድሃኒቶችበአካባቢእናበሰውልጅለይሊያመጡየሚችሉትንተፅእኖግንዛ

ቢውስጥትከታላችው? እንዴት?

6. ተጠቅመውከሚጣሉእቃዎችይልቅበድጋሚልንጠቀምባቸውነገሮችንየመግዛትልምድአላችው?

7. በሆስፒታልውስጥያሉኬሜካሎችንእንዲሁምማሽነሪዎችወደተሻሻሉ፥

ደህንነትወዳላችውዘመናዊማሽኖችየመቀየርልምድአለ?

መጋዘንእናእቃዎችዝርዝርአመራር (Warehousing and inventory management)

1. በየጊዜውማዘዝያላባችውንየእቃወይምየመድሃኒትብዛትእንዴትነውየምትወስኑት? የ information

systems ኢንቨንቶሬአመራርለይከእጅከሚሰራ(manual) አሰራርእንዴትታወዳድሩታላችው?

2.

ከአቅራቢዎችጋርበጋራበመወሰንየሚያስፈለጉትንእቃዎችበስምምነትለረጅምጊዜያማቅረብእንዲሁምመረጃ

ንመለዋወጡምንያህልየተለመደነው? ለምሳሌ vendor-managed inventory, CPFR?

3. ትልልቅለሆኑእቃዎችወይምማሽነሪዎችባታውለይየማስገጠምነገርአለ?

መጋዘንውስጥከማስገባትበቀጥታቦታውለይ?

4. ከዋናውመጋዘንወደተለያዩዲስፒንሲንግዩኒትእንዴትነውበየጊዜውየምታቀርቡት?

5. እንዴትነው min-max inventory management የምታካሄዱት?

ከመድሃኒትውጪያሉሌሎችእቃዎችስአመራርምንይመስላል?

የማጓጓዓዣእናስርጭትአመራር (Transportation and distribution management)

1. የማጓጓዣእናስርጭትአመራርበሆስፒታልምንይመስላል?
2. የውጭትራንስፖርትንበጋራየመጠቀምአሰራርአለ?

   የፐብሊክትራነስፖርትእንደምሳሌመውስድይቻላል?
3. የፐብሊክትራንስፖርትበሆስፒታሉምንያህልተቀባይነትአለው?

   እንዲሁምምንያህልታበረታታላችው? በአሁኑሰዓትየፐብሊክትራንስፖርቱንእንዴትይገልፁታል?

አማራጭየሀይልምንጮችንወይምቴክኖሎጂዎችንሆስፒታሉይጠቀማል?

ታካሚዎችሆስፒታሉንየሚጎበኙበትንጊዜለመቀነስሌላአማራጮችተጠቅማችዋል? ለምሳሌ telehealth, home healthcare, and videoconferencing?

የመረጃእናቴክኖሎጂአመራር (Information and technology management)

1. የመረጃእናየቴክኖሎጂሲስተምበሆስፒታሉእንዴትይጠቀሙታል?

2.

እቃዎችንእናመድሃኒቶችንተደራሽለማረግእንዲሁምሎጂስቲክስወጪለመቀነስየጋራተነሳሽነትአለበመረጃ

እናቴክኖሎጂክፍሉ?

3. ኢ-ኮሜርስለመጀመርምንአይነትእንቅስቃሴአለ?

4. እቃዎችንተከታትሎየደረሱበትንለማወቅየምትጠቁሙትሴስተምምንድንነው? (e.g., barcodes,

Radio Frequency identification ለመጀመርምንአይነትተነሳሽነትአለ?

5. ከሌሎችየአቅርቦትትስስርአጋሮችጋርበመረጃመረብትስስርየሚያገናኝሲስተምአላችው?

አሁንስእንዴትነውከሌሎችአጋሮችጋርየምትገናኙት?

6. እስቲስለዋናውመጋዘንእናውራእና automated ነው? ካልሆነ፥ለማረግምንአይነትስራእየተሰራነው?

7. በሆስፒታሉመድሃኒቶችን፥የላብራቶሪውጤት፥ምግብንእንዲሁምቆሻሻንለማስወገድ automated

ሲስተምትጠቀማላችው? እስቲእነዚህንነገሮችንእንዴትነውየምታስተዳድሯቸው?

8. ከአቅራቢዎቻችውጋርያላችውንግኙነትየምታስተዳድሩበትምንአይነትሲስተምአላችው?

የሀይልአመራር (Energy management)

1. ሀይልንለመቆጠብምንአይነትተነሳሽነትአለ? ለምሳሌሀይልቆጣቢአምፖልማረግ

2. ሌሎችአማራጭሀይልትጠቀማላቹ?

3. አካባቢንየማይጎዱየሀይልአማራጮችንመጠቀምአስባችውታውቃላችው?

4. ማህበራዊአስተዋፆበሰራተኞንእንዲኖርምንታደርጋላችው? ለምሳሌማሽንበማያስፈልግበትጊዜማጥፋት?

የውሃአመራር (Water management)

1. ውሃንለመቆጠብምንአይነትተነሳሽነትአለ? ለምሳሌየሚፈስየውሃቀዳዳንመድፈን፥

የዝናብውሃንመጠቀም፥ውሃንበድጋሚመጠቀምየመሳሰሉት

2. ከ film-based radiology ወደ digital imaging ተቀይሯል?

የምግብአመራር (Food management)

1. ምግቦቹከየትመጥተውይስተናገዳሉ? ሀገርውስጥየሚበቅሉ organic ምግቦችንታቀርባላችው?

2. ለታካሚዎቻችውየምትሰጡትየምግብእንክብካቢምንይመስላል?

ደንብአውጥታቹበዛመልኩነውየምትንቀሳቀሱት?

3. ዘላቂያዊነትያላቸውንምግቦችእንዴትነውየምትገዙት? (rBGH-free, cage-free eggs, meat produced without chormones or antibiotics, certified organic and fair-trade coffee)?

4. ከትንንሽየከተማሻጮችጋርበጋራየመስራትነገርአለ? ከነርሱመቀበል?

-አትክልቶችንእናጤናማየሆኑምግቦችንለማቅረብምንአይነትአሰራርአለ?

5. ነገሮችንበድጋሚየመጠቀምልምድአለ? ለምሳሌምግብማቅረቢያዎችን, ፕላስቲኮችን?

የሆስፒታልዲዛይን (Hospital design)

1. ሆስፒታሉእንዴትነውዲዛይንየተደረገው? ምንአይነትነገሮችንግምትውስጥገብተዋልሲሰራ?

2. የነርሶችየስራቦታ፥የፋርማሲዲስፒንሲንግዩኒትእንዲሁምሌሎችዩኔቶችበበቂሁኔታተገንብተዋል?

መሻሻልያለበትነገርአለትላላችው?

3.ሆስፒታሉዘላቂያዊነትንመሰረትአድርጎነውየተገነበውተላላችው?

ለምሳሌለትራንስፖርትአመቺበሆነቦታነውየተገነቡት? ነፋሻእናለታካሚምቹሆነውነውየተሰሩት?

4.ሆስፒታሉዘላቂያዊእንዲሆንምንአይነትስራእየተሰራነው? ለምሳሌሆስፒታሉንመገምገም?

የቆሻሻአመራር (Waste management)

1.ውስንነገሮችንበመጠቀምየተሻለአሰራርንለመፍጠርተሞክሮአለ?

2.

ቆሻሻንበመለየትለምሳሌበድጋሚኡደትውስጥገብቶየሚያገለግልንመለየትእንዲሁምመረዛማንነገሮችንመለ

የትእንዴትይከናወናል?

3. በድጋሚየምትጠቀሙበትማንኛውምእቃአለ? እስቲበደንብአብራሩልኝ?

4. ቆሻሻንአቃጥሎከማስወገድውጪሌላየቆሻሻማስወገጃመንገዶችንትጠቀማላችው?

እስቲምንአይነትመንገዶችንእንደምትጠቀሙንገሩኝ?

5. Reverse logistics ይህም re-distribution ጨምሮለማካሄድየምትጠቀሙትምንአይነትምንገዶችንነው?

የሰራተኞችእናየማህበረሰቡባህሪይ (Staff and community behavior)

1. የአቅርቦትትስስርሰራተኞችንእንዴትትቀጠራላችው? የማስልጠኑስነገርመንያህልየተለመደነው?

2. በማህበረሰቡውስጥዘላቂያዊአስተሳሰቦችንለመፍጠርምንመሰራትአለበትብላችውታስባላችው?

3. ሰራተኞቻችውዘላቂያዊነትንእንዲማሩምንአይነትጥረትታደርጋላቹ?

4. ከማህበረሰቡጋርበጋራበሽታንየመከላከልእንዲሁምአካባቢንየመጠበቅስራእንዴትትስራላችው?

5.

ከተለያዩአካላትጋርበጋራአካባቢያዊችግሮችንበዘለቂያዊሁኔታለመፍታትምንአይነትስራዎችመሰራትአለባች

ውትላላችው? በሆስፒታሉስምንአይነትስራዎችእሰራሉ?

ሌሎችልምዶች

1. የ quality management practices በተመለከተማብራርያልትሰጡንይችላሉ? ለምሳሌ quality ፖሊሲ፥ ሰራተኞችንማሰልጠን፥ስራዎችንዲዛየዕንማረግ፥ operating procedures መቅረፅ፥የ operating proceduresንምቅረፅ፥ኪሊቲ data and reporting ሲስተምመዘርጋት፥ የሰራተኞችየርስበርስግኑኙነትንማጠናከር?

2. የታካሚዎቻችውእንቅስቃሴሎጅስቲክስምንይመስላል? በስራኡደትውስጥያለጊዜወሳጅእናአላስፈላጊፕሮሰሶችንለመቀነስምንእንቅስቃሴአለ?