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Diploma Thesis

Supply Chain Management In Healthcare Industry:A Case Study



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Business Administration

Thesis title

Supply chain management in health care industry: A Case Study

Objectives of thesis

The primary objective of this study is to examine the use of supply chain management Practices in health care industry. Specific objectives seek to;

- Establish the supply chain management operational factors of supplies at Apollo Hospitals.
- Examine the impact of supply chain management of consumables and non-consumables on healthcare service delivery at Apollo Hospitals.
- Examine the cost savings that arises from implementation of supply chain management at Apollo Hospitals

Methodology

The case study has been chosen to allow the researcher to undertake a detailed analysis data gathered from respondents' experiences and knowledge of SCM concepts and practices in its natural Environment. Similarly, a literature review will be carried out as a part of the qualitative to offer a good theoretical understanding of SCM practices and concepts. The analysis of the results will involve both statistical analysis and descriptive analysis.

The proposed extent of the thesis

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Keywords:

Supply chain Management, Cost optimization, financial benefit, service delivery, patient care

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- Acharyulu, G. V. R. K., & Shekbar, B. R. (2012). Role of value chain strategy in healthcare supply chain management: An empirical study in India. *International Journal of Management*, 29(1), 91-97.
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- Ambe, I. M. (2010). Agile supply chain: strategy for competitive advantage. *Journal of Global Strategic Management*, 7, 5-17.

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Declaration

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Acknowledgement

I declare that this thesis " Supply chain management In Healthcare Industry : A case Study" with supply chain management In Apollo Hospital " developed independently under the guidance of the **supervisor Ing. Petr Prochazka, Ph.D., MSc** and the use of literature and other information sources that are cited in the work and listed in the references at the end of work. As the author of the referred thesis I also declare that I did not infringe the copyright of third parties in the context of its creation.

Řízení dodavatelského řetězce ve zdravotnickém průmyslu

Souhrn

Tento výzkum se zabývá řízením dodavatelského řetězce ve zdravotnictví v Indii za pomoci případové studie Apollo Hospitals; konkrétně se zaměřuje na stanovení provozních faktorů a finančních benefitů plynoucích z řízení dodavatelského řetězce. Studie také zkoumá dopad řízení dodavatelského řetězce na poskytování zdravotní péče a vyhodnocuje, jak může pohyb informací mezi různými odděleními nemocnice pomoci předcházet nedostatku zásob. Následující kapitola popisuje pozadí studie, definici problému, její cíle a výzkumné otázky. Věnuje se také použité metodologii.

Klíčová slova: řízení dodavatelského, Logistické, řetězce, řízení zásob, dodací lhůta, optimalizace nákladů, finanční výhody, péče o pacienty.

Supply chain management in health care industry : A case study

Summary

Current research examines supply chain management in health care in India using Apollo Hospitals as case studies. In particular, the research focuses on the identification of operational factors and the financial benefits of supply chain management. The study also examines the impact of supply chain management on healthcare delivery and evaluates how it can help between different hospital departments to help to prevent stock out. The following chapters describes studies, problematic statements, goals, and research questions. It describes the methodology to be used for study.

Keywords: Inventory management, Logistic, delivery time, cost optimization.

Financial benefits, patient care

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Chapter 1

1.1 Introduction

The present research examines Supply Chain Management in health **care industry in India using Apollo Hospitals** as a case study. In particular, the research seeks to establish the operational factors and financial benefits that arise from supply chain management. The study as well examines that impact of supply chain management on healthcare delivery, and evaluates how information movement among the various departments of the hospital can assist in preventing stock-outs. The following chapter details the background of the study, problem statement, the aims and objectives, and the research questions. It has well outlines the methodology to be used for the study.

1.2 Background of the study

Supply Chain Management is a vital concept that cannot be underestimated in our hospitals today where technology is advancing at a high rate. In the age of competition, there is no industry that can survive effectively without concentrating much on reducing expenditures at all cost. A research by Hall (2006) indicates that, the health care industry is experiencing a sharp increase in price in almost all of its goods and services. The alarming pace of cost creates the strong need to embrace supply chain management which would allow the healthcare industry to survive and function effectively in the age where technology is growing at a high rate.

Manias (2010) underlined that the main aim of the healthcare supply chain is to deliver

products and services in a timely manner, in order to achieve the set goals and objectives and meet the needs of the providers. It is vital to note that, the stakeholders in the healthcare supply can be categorized in three major groups which are producers, providers, and purchasers (Manias, 2010). In this regard, the producers include the medical devices, Pharmaceuticals, and medical and surgical supplies; purchasers include distributors and Wholesalers of medical services, while providers include hospitals, physicians, clinics, Pharmacies and nursing homes among others (Ambe, 2012). Over the past decades, most hospitals have faced the challenge of rising costs and this hinder them from achieving their goals and objectives of delivering quality care to patients (Burns, 2012). As a result, most lives are lost and thus, increasing the urgency of embracing solutions that would allow the healthcare industry to have adequate facilities especially in the era where technology is advancing tremendously (Kogan & Tapiero, 2007). In the 21st century, Ambe (2012) points out that most hospitals are looking for ways to increase their margins through cost containment and revenue enhancement, and often regard the hospital's logistical supply chain as a great opportunity to control cost, boost patients care and safety, and improve staff time. Hospitals are also embracing ways they administer their care in the most cost effective way thus, saving lives. Bhakoo, Singh & Sohal (2012) argued that, as hospitals embrace ways to improve their margins through cost containment, they need also to embrace the hospitals logistical supply chain and procurement as way to control cost. It is crucial to note that, hospitals need to provide patients with adequate medications, surgical products, and medical consumables. In essence, each of the mentioned categories of the product is handled differently in the

hospital and thus, requires a different practice of supply chain. Although each chain may require a different consideration, there are some aspects that are common across hospitals such as having a central inventory for medical consumables that allow healthcare providers to access products at ease thus delivering quality care.

Bhakoo, Singh & Sohal (2012) that supply chain management is a crucial aspect that cannot be ignored in the healthcare industry in that, it influences how the healthcare services are provided. As noted by Toba et al (2008), most of research on supply chain management has been from the traditional manufacturing industry. Nonetheless, there have been a number of attempts to research SCM application in the service sector. Therefore, the present study will focus on examining the impact of supply chain management on operations and financial performance on Apollo Hospitals.

1.3 Problem statement

Over the recent past, many scholars have stressed the important role played by SCM (*see*, Kaipia, 2008; Kelle, et al., 2012). They have pointed out that suitable SCM practices lead to operation cost reduction and competitive advantage. Whereas in the manufacturing sector SCM has a long history, in the healthcare industry, it seems to have been left behind in implementing SCM practices (Ambe, 2012). Indeed, as observed by Ambe (2010) inventory management and distribution within the healthcare sector has been normally viewed as an area of little value. Nonetheless, studies by Halldórsson & Svanberg (2013) have revealed that huge cost savings and profits can be generated by application of better distribution inventory management. Accordingly, improved supply

chain in healthcare facilities like hospitals can result in better inventory management, improved vendor relationships, effective work flows, and more satisfied patients (Chindove & Mdege, 2012). Annan et al (2013) observes that in many developing nations, including India, logistics and supply systems for public hospitals are normally centralized. Thus, many activities such as logistics planning, procurement, storage, forecasting and distribution are carried out by regional directors. Accordingly, the system has been established to be ineffective, because enough supplies are usually not delivered timely. This inefficiencies leads to poor cost management in inventory and poor healthcare delivery to the patients (Chindove & Mdege,2012).

In relation to costs, Rachmania & Basri (2013) notes that supply chain accounts for approximately 27% of the operational costs incurred by hospitals across the world. Thus, it is necessary to manage these costs in an effective way to ensure that the objectives of services and costs are met. For example, a review of Apollo Hospital financial statement shows that in 2015, the hospital spent about 30% of its funds on buying non-drug items. Studies indicate that considerable amount of the above costs could be saved by having an effective supply chain management and practices. It is against this background that the present study seeks to critical examining supply chain management in the health care industry, focusing on the main Apollo Hospital as a case study hospital.

1.4 Objectives

The primary objective of this study is to examine the use of supply chain management practices in health care industry. Specific objectives seek to:

- Establish the supply chain management operational factors of supplies at Apollo Hospitals.
- Examine the impact of supply chain management of consumables and non-consumables on healthcare service delivery at Apollo Hospitals.
- Examine the cost savings that arises from implementation of supply chain management at Apollo Hospitals.
- Determine ways in which the hospital can improve its supply chain management practices.

1.5 Research questions

To achieve the set objectives of this study, the underlined research questions have been formulated to guide this study.

- What are the supply chain management operational factors of supplies at Apollo Hospitals?
- What is the impact of supply chain management of consumables and non-consumables on healthcare service delivery at the hospital?
- What is the cost savings that arises from implementation of supply chain management at the hospital?
- What are the ways in which hospital can improve its supply chain management practices?

1.6 Significance of the study

The study is significant to the healthcare facilities, particularly Apollo Hospitals and policy makers because its findings will assist them to understand how they can improve on the efficiency of their SCM practices. More so, findings of the study will indicate ways in which information movement, operations and service delivery can be improved. Certainly, the findings of this study would assist the management of the hospital to review their current SCM policies and possibly amend them where necessary.

1.7 Methodology

In undertaking this study, the researcher will apply quantitative methodology where a case study will be used. The case study has been chosen to allow the researcher to undertake a detailed analysis from data gathered from respondents' experiences and knowledge of SCM concepts and practices in its natural environment. Apollo Hospitals is selected as a single case study, and its selection was informed by chain of the hospital, it a big significant chain with a 64 medical facilities spread across India, this implies that it does a huge purchases. Similarly, a literature review will be carried out as part of the qualitative to offer a good theoretical understanding of SCM practices and concepts. The analysis of the results will involve both statistical analysis and descriptive analysis.

Chapter 2

Literature review

The present chapter gives a critical review on supply chain management in health care industry. It looks at past empirical studies carried out by various researchers with the Objective comparing the findings of these researchers and establishing how these past studies relates to the present one.

2.1 Defining supply chain management

Menter et al., (2001) views supply chain management as a comprising of independent business entities that are integrated by upstream and downstream association in varying business processes and activities that result in goods or services to the customers. Supply chain comprises of a sequence of activities that a business applies in delivering value as a product, service or both to its customers (Heikkilä, 2002). Similarly, supply chain can be defined as an integrated material and information movement between customers, suppliers and producers. Therefore, supply chain management can be viewed as a business concept that tries to combine the interdependent activities as well as resources in a chain, starting from the manufacturer to the customers. Hence, SCM comprises various types of dependencies among and across firms in channels that run from suppliers to consumers. Lambert and Cooper (2000) argued that supply chain management within the healthcare industry is shows some unique attributes that makes it more complex to change information from the corporate world to healthcare industry directly. Sharing the same view, Halldórsson, and Svanberg (2013) observed that performance measurement applied in a healthcare environment appear to be challenging than that present in

industrial companies owing to the complex concepts such as “quality of care”.

Nonetheless, this cannot wholly be true since current concepts and SCM practices indicate that SCM in health services does not differ much from that applied in industries.

2.2 The impact of supply chain management of consumables and non-consumables on healthcare service delivery at the hospital

In the recent past, companies have realized that having an effective supply chain management can create a competitive advantage for them (Abu-kharmeh, 2012). Indeed, some of the leading companies have been able to differentiate themselves simply by managing better their supply chains as opposed to the specific products or services they offer. Annan et al. (2013) observes that unlike in the manufacturing industries, the healthcare delivery system is complex and this makes it hard for many people to fully understand how they operate. Zailani and Rajagopal (2005) has pointed that several studies have examined supply chain systems in terms of the material and logistics they should have, and concluded that effective system is able to ensure that the materials reach the consumers at the right time. This is an important element of enhancing desired results. For example, a study by Rajagopal found a direct link between supply chain management activities and performance improvement. Bhakoo and Chan (2011) analyzed healthcare systems and established that supply chain management systems were one of the main areas where it was easy to achieve cost reduction when efficiency is increased. This observation was shared by Lori et al., (2011) who also found that efficient supply chain system could lead to reduction in material and logistics costs. Lori et al.,(2011) noted that inventory management accounted for between 18% and 34% of

the net revenue of hospital. Accordingly, when a small saving in inventory management is achieved, it has a significant effect on the bottom-line of a hospital. As asserted by Manias (2010) economies like the United States, Canada and other developed economies applies SCM to manage their procurement of logistics.

Gansler et al (2004) gives an example of USA's Department of Defence (DOD) that has been able to reduce its costs by cutting on lead time in its logistics management by using SCM best practices. As explained by Manias (2010) lead time implies that duration taken to deliver a purchase order after it has been made. Likewise, the Office of Government of Commerce (OGC) in the United Kingdom gives an annual update on best SCM practices, which can be followed by the public sector. According to the OGC best practices of SCM include establishing precise consumption rates, maintaining economic lowest stock amounts, and having good relationships with suppliers. Ling and Ling (2012) agree that the relationship between a company and its suppliers could enable the company to have a competitive advantage. Abu-kharmeh (2012) notes that some firms have implemented a number of strategies that promote exchange of knowledge with their suppliers, and they have managed to enhance their operations increased their competitiveness (Ling and Ling, 2012). Still, for companies to attain competitive advantage in their respective industries, the management should strategically plan and direct resources in an effective way to meet the changing demands of external business environment (Manias, 2010).

Though SCM offers a great opportunity for companies, it comes with some challenges that faces both manufacturing companies and hospitals. These challenges could be different from one hospital to another based on the environment and the management.

Ling and Ling (2012) give importance to human aspect when he observes that 80% of supply chain problems are caused by people involved in the process either directly or indirectly. Bhakoo and Chan (2011) echo similar sentiments by stating that human actions and inactions contribute considerable to many of the SCM challenges. De Vries and Huijsman (2011) notes that organizational structure and culture, functional disagreements, lack of commitment from the management, resource limitations, lack of trust, and complexity of SCM are some of the challenges that face companies in their SCM. More so, Ambe (2010) found that limited education on how SCM works was a major barrier to effective implementation and operations of SCM.

Ambe (2012) established that within the healthcare industry, one of the common SCM challenge the fact that hospitals operate in a different way as opposed to normal businesses. On many occasions, it is hard to predetermine the group of patients hospitals get at each point and time and determine the supply consumption they will require (De Vries and Huijsman, 2011). Sinha & Kohnke (2009) agrees that the inability to establish the number of patients coming and going out makes it hard to determine the type of patients that will require health care at any given point. Ling and Ling (2012) underscores that this is a big consequence and pushes hospitals to hold a high amounts of safety stock resulting in storage challenges and in some cases expiration of the products. In addition, barriers such as complexity aspects of public procurement and related regulations also hinder effective implementation of SCM in hospitals. Ling and Ling (2012) in their study found that hospital faced a challenge in their SCM in relation to managing their stocks after they have been given to them. In many health care facilities

there are no systems to monitor how supplies are used after they have been delivered to departments. A related study carried out by Al-Saa'da et al., (2013) at hospital in Jordan, found that though all medical requisitions are made by the Administrator prior the store keeper gives supplies, there were no effective steps taken to establish the way the supplies are finally used in the departments. Likewise, Sinha and Kohnke (2009) found that some hospital lacked qualified or enough people to manage medical stores. The researchers concluded that such challenge is widespread in many hospitals and have negative impact on SCM (Sinha and Kohnke, 2009). They as well noted that this could impact the quality of healthcare delivered to the patients.

2.3 Integration of Supply Chain Management

Annan (2013) argued that for hospitals to ensure that they are regular and uninterrupted consumables, it is imperative for them to integrate all their logistical functions. This is because well integrated and coordinated logistical activities results in value for money. Abu- kharmeh (2012) underlines that supply chain integrations is a common way of directing resources towards operational competencies and improvement of efficiencies. Syazwan and Abu Bakar (2014) has noted that healthcare organization across the world are finding strategies to improve operational efficiencies, and in turn reduce costs, while maintain good patient care. Recent studies tend to focus mostly on integration components and processes at the database level, particularly in individual departments. Syazwan and Abu Bakar (2014) notes that business management is going through an era of inter-network Competition, and the success of any organization will depend on the ability of the management to integrate the network of their businesses. Chen (2013) agrees that the opportunity to apply processes integration within the functions of

health care facilities is viewed as an important aspect of creating competitiveness.

Chen (2013) view SCM as a tool that can be used by hospitals to integrate and manage their activities by creating collaborative organizational relationships, enhanced business processes, and high degree of information sharing to form high performing systems that offer member organizations with a competitive advantage. Bhakoo and Chan(2011) gives similar views by stating that organization that integrate are able to work together by creating partnership to increase their competitive advantage of their supply chains. Abu-kharmeh (2012) agrees that supply chain literature is stressing the importance having integration in improving value and cutting down costs. Toba, Tomasini, and Yang (2008) in their study established that they were a clear relationship between supply chain management and operations.

McKinsey & Company.(2013) established that supply chain integration can be facilitated through information technology that directly affects financial performance the companies.Indeed,integration of SCM is aimed at adding value at every phase of the process from the point when the products are demanded to the point when they are acquired. ICT tools for example Enterprise Resource Planning (ERP) is increasingly being used in hospitals to better effect.

2.4 Supply chain management practices in health care industry

As noted by Al-Saa'da et al., (2013) healthcare industry is a broad one that comprises of not just clinics and hospital, but also pharmaceutical companies, medical suppliers, distributors,government agencies, regulators, insurance companies, technology vendors, medical supplies and logistics. These many players within the industry are the ones that cause the complexity in SCM in health industry. In a study carried out by Rachie et al

(2010) focusing on the aspect of reverse logistics and particularly recycling of medical products, they argued that SCM resulted in considerable financial and operational benefits. Similarly, a study carried by Kumar et al (2008) on the evaluation and enhancement of the recycling of pharmaceutical products in the Manchester Royal Infirmary (MRI), it was found that management in many hospitals focus on reducing operational costs, particularly in relation to acquiring supplies at lower prices. However, Kumar et al (2008) argues that this is merely part of the entire cost. As such, to gain cost reductions, healthcare facilities should assess their processes and related costs by removing activities that do not add value.

A study undertaken by Meijboom et al (2011), established four main problem sets in hospitals; communication, waiting times, integration and patient safety. Their findings were founded on a literature review on a comparison of patient experience in different countries. The researchers state that the biggest problem in healthcare SCM and the weakest point happen between providers. Accordingly, SCM can successfully be applied to reduce these problems. Several issues that include medical records of patients and provider performance have to be examined and improved.

Chen (2013) investigated the issue of inventory management in healthcare supply chain management. He noted that hospitals required maintaining an effective inventory of medical products and supplies to meet immediate demands; however this policy whereas it is essential, may result in increased costs. To deal with this, Chen (2013), states that there should be integration between hospital-supplier. According to Smith, Nachtmann & Pohl (2012), it is important for health care industry to manage its resources effectively and ensure that quality services and cost objectives are met. Over the years, this research continue to outline that the supply chain linked with the pharmaceutical goods has been critical in most hospitals in enhancing a high standard of care of patients and creating a strong platform for adequate supplies of medication. In terms of cost, this research affirms that the supply accounts for the 25-30 percent of the operational cost of hospital.

Therefore, understanding how resources are managed in the healthcare industry is vital in improving quality services. Reducing healthcare costs has been a requirement for many hospitals, particularly when payers start to claim for high reimbursement amounts to cost and quality performance. As a result, VanVactor (2011) believes that, many organizations have looked at measures that would reduce its budget so that it can meet the high demands posed by employees. However, most hospitals that intend to achieve better results of quality services and maintain competent employees have examined their healthcare supply chain management. In healthcare, Ilie & Popa (2013) affirm that managing the supply chain is a complex process having in mind, there must be a strong relationship between the clients and suppliers to deliver excellent customer services at an affordable price. This implies that, most healthcare organizations face the challenge of meeting the health needs while still maintaining the cost outlined. This study continues to highlight that, the healthcare supply chain management is unique since each stakeholder has its interests and thus, each of them may have different goals in the supply chain. For instance, providers may want to utilize a specific product because they are equipped to work on it, whereas hospital executives may go an extra mile of purchasing the most affordable quality products that meet the needs of patients. From this analysis, it is evident that since the supply chain goals and objectives may not always align with the organization's healthcare providers, the healthcare supply chain management may be fragment and inefficient. Arguing from this point of view, Ma Gloria (2015) argues that, healthcare organizations should take into account the interest of every stakeholder to settle on specific goods 'budgets. Every individual should be embraced when making decisions as this increases a strong sense of belonging and boost customers 'services. Over the years, questions have emerged on what healthcare supply chain management

entails (Machado, Scavarda & Vaccaro, 2014). The research helps readers to understand the process that occur in the hospital set-up with an aim of creating insights about the healthcare supply chain management. Now, according to this research, hospitals ‘providers often use many items such as syringes, gloves, papers, computers, prescription drugs, and papers just to name a few. Staffs involved in the healthcare supply chain management are responsible for providing organizations with products the healthcare providers need in delivering quality care. Now, this research creates a strong ground to understand that managing supply chain does not only entails providing adequate gloves but ensuring that the hospital deliver quality services thus, promoting quality life. It is crucial to note that, the supply chain starts when the items are manufactured and sent to the distribution centers. Depending on the nature of the product, hospitals can either purchase inventory directly from the distributor or manufacturer (Fibuch et al, 2015). Organizations may also decide to team up and purchase a product as a group, which in this case would reduce the cost. When this process is done, medical products are then sent to healthcare organizations, where products are stocked to be used by providers and patients. At this point, organizations ensure that healthcare providers have adequate facilities to deliver quality care and thus, working towards improving quality care. Another crucial aspect of healthcare supply chain management entails the regulatory agencies that regulate if the medical resources are fit for consumer use. As a result, this ensures that the healthcare industry achieves the overall goal of promoting quality care at affordable price. In their study, Kim & Kwon (2015) established that most healthcare providers tend to believe that they cannot control their cost and production schedule, unlike managers in

other industries. As a result, this causes the healthcare industry to rank behind in providing quality services in a more efficient way, which negatively affects the result of treatment and services provided by healthcare providers. To Bohme, Childerhouse, Deakins & Towill (2014), logistics and supply systems in many developing nations such as, India are normally centralized. As a result, most activities such as forecasting, storage, procurement, and planning are conducted by the regional directors. The system is ineffective because regional directors fail to deliver services in a timely manner thus, hindering effective quality care.

Accordingly, this causes poor cost management in inventory and poor quality services to patients. A research by Singh & Kumar (2016) indicates that India is the world second largest populated country, increasing from 760 million in 1985 to over 1.3 billion in 2015. With this in mind, it is clear that the existing healthcare facilities are not adequate to meet the needs of the population that is increasing at a high rate. Although the state and central government have responded to this concern by offering universal healthcare services and free treatment at government hospitals, most hospitals are understaffed and lack adequate products to meet the population of the country. As technology increasingly plays a crucial role in healthcare, the healthcare industry opts to embrace the change that by its nature is costly. Most experts believe that, the Indian healthcare infrastructure is not fully equipped to keep with pace of the growing demand of the population (Behzad & Moraga, 2011). Although the country offers free treatment in government hospitals, most people choose private healthcare facilities due to the accessibility of specialist doctors and efficient treatment. Typically, healthcare in India is limited by various factors such

as poor health, lack of adequate human workforce, and dysfunctional physical infrastructure.

2.5 Cost savings that arise from implementation of supply chain management at the hospitals

Lambert, et al. (2006) has argued that cost reduction is usually the main objective of implementing SCM. However, Lambert, et al. (2006) points that though it can be achieved; it is not easy to measure whether cost reductions have been achieved owing to the nature of the industry. In spite of government pressure on healthcare facilities to reduce costs, many a times this is not attained due to behaviors of managers who prefer quality products and services, rather than lowering of prices. It has been argued by Lian and Laing (2005) that there is a considerable difference between private and public sector in terms of procurement practices. Lian and Laing (2005) note that public sector facilities nearly entirely depends on transactional –based strategies. The restrictions put by public policy on procurement practices lead to sub-optimal results. Bhakoo and Chain (2011) enumerate that the global manner of suppliers is as well a critical point when considering adopting healthcare SCM. As such, cooperation and trust among partners is necessary for successful SCM.

Ferrer & Medhekar (2012) in their study agreed that cost saving is one of the benefits that emerge from embracing supply chain management in healthcare industry. Ferrer & Medhekar (2012) acknowledge that supply chain management entails the active management of supply chain activities to boost customer value and attain sustainable competitive advantage. Supply chain management allows hospitals to develop and run

their services in the effective and efficient ways thus, promoting quality care. Now, this research continues to affirm that supply chain covers various segments such as production, logistic, product development, and the information needed to coordinate the mentioned activities. Healthcare supply chain management entails obtaining managing supplies, obtaining resources, and delivering products and services to patients and providers in a timely manner. Promoting efficiency in supply chain management helps in overcoming the challenge of reducing the cost that often emerge when there is no effective management. It is crucial to note that, human beings are complex and understanding how to manage them is crucial towards achieving the set goals and objectives. Supply chain management ensures that every chain is delivering its goods and services in an efficient and timely manner thus, promoting quality life. For instance, the supply chain management ensures that healthcare providers are using the necessary tools and services that foster quality health in a timely manner. As a result, the hospital reduces cost often associated with medical errors and delay treatment.

Supply chain management also improves competence in that every individual involved in the supply chain embraces the necessary skills and abilities required to deliver efficient results. As supply chain management boost competence, it also reduces cost used in the healthcare often associated with recruiting additional workers (Dellana & Kros, 2014). Often, most hospitals around the world complain of not having adequate staff while the problem is rooted in the poor management of the supply chain. When every individual understand the roles and responsibilities he ought to play, then it becomes easier to deliver goods and services in a timely manner thus, saving cost often associated with the

delayed treatment. In his research, Acharyulu & Shekbar (2012) outline that supply chain management is a crucial aspect in the modern society where technology is advancing at a high rate. The world is globalizing at a high rate and the healthcare industry cannot survive effectively without reducing its expenditures at all cost. It is vital to note that, technology comes with cost but its results save time and resources. Supply chain management ensures that the hospital is using the right technology at any given chain flow thus, saving the cost that would emerge from using the wrong technology.

According to Dellana & Kros (2014) supply chain management helps every stakeholder to understand his goals and objectives in align with achieving the desired results in the healthcare industry. The management also ensures that every stakeholder embraces technology in the right way thus, boosting communication, reducing errors that emerge from manual work, and improve quality care. Achieving these results enable the healthcare industry to save cost that often emerge from poor communication, medical errors, and lack of competence on how to perform healthcare services.

Bhakoo, Singh & Sohal (2012) asserts that many hospitals in the modern society are looking for ways to boost their margin through revenue enhancement and cost containment, and often they embrace the hospital's supply chain as the most convenient opportunity to control cost, boost patients' care, and improve services delivered on time. Supply chain management enables hospitals to administer their care efficiently thus, saving lives. The supply chain management allows hospitals to provide patients with adequate medications, enough surgical products, and medical consumables. The management determines how goods are distributed from the manufacture, healthcare providers, to patients and thus, every step

involved in the chain flow can either delay or facilitate an efficient healthcare. The healthcare SCM starts when manufacturers produce the medical products and further send them to the distribution center (Burns, 2012). Medical products are further distributed to the healthcare organization where goods are stocked to be used by providers to patients. At this point, the organization ensures that the products are kept safe thus, eradicating issues that may emerge on misplacement of products thus, saving cost that may arise from such actions. The supply chain management also ensures that patients are given the right treatment in a timely manner thus, reducing errors that may emerge from administering the wrong treatment, which eventually may enhance a huge cost. From the ongoing discussion, it is evident that supply chain management ensures that effective decisions are made from the manufacturers to healthcare providers in providing quality treatment and care to consumers. When effective decisions are made it facilitates a smooth running of the healthcare delivery, which in turn determines how healthcare is delivered. With this in mind, it is important for the healthcare industry to embrace the supply chain management in their operation as they create a strong ground for every stakeholder to understand its goals and objectives in meeting the health needs of patients. Technology is advancing at a high rate and this increases the need to embrace ways to reduce unnecessary cost that would hinder effective healthcare operation (Mehralian, Zarenezhad & Rajabzadeh, 2015). Embracing technology in the modern era is a great towards a successful supply chain management, which birth great results on how health care is delivered.

2.7 Ways in which hospitals can improve its supply chain management practices

There is a number of ways that healthcare facilities can apply to create effective supply chain. According to Chen (2013), hospitals should keep an efficient inventory of medical suppliers including drugs to meet emergency situations. Similarly, Chen (2013) argues that use of technology in the supply chain is important since it enhances the effectiveness of the supply chain.

CHAPTER THREE

Methodology

3.1 Introduction

The present chapter presents the methodology that will be used in achieving the set objectives of the research. It details the research design and approach that was used. The chapter will also briefly give the profile of Apollo hospital that has been selected for this research. Also, it explains the sample population, sampling techniques and data collection method. It will also explain data analysis to be used and ethical issues observed in undertaking the research.

3.2 The hospital

The research is based on case study approach of Apollo Hospitals in India. Apollo has a bed capacity of more than 10,000 beds spread across 64 hospitals, over 2200 pharmacies and more than 100 primary care and diagnostic clinics. In addition, there are 115 telemedicine units operating in 9 countries. Apollo Hospitals as well provides insurance services, offers global consultancy, and 15 academic institutions with a vibrant research foundation focused on global clinical tests, stem-cell, genetic research and epidemiological. The hospital selected for this study was Chennai that was established in 1983, which has become a leading medical institution in the world. The hospital management was informed of the study in advance through an email, which they agreed to.

3.3 Target population

According to the findings of Cohen, Manion, & Morrison (2007), a population is a complete set of individuals in a specific environment with similar characteristics whom the researcher is interested in. In this research population the selected target population for the research was employees working in Apollo Hospital. The hospital has a total of 800 employees from different special and technical backgrounds. Owing to the fact that the primary activity of the hospital is provision of healthcare, majority of the employees work in clinical department. They comprise of doctors, nurses, clinical officers and laboratory staff.

3.4 Study approach

Cohen, Manion, & Morrison (2007) observes that when a researcher undertakes to complete a research, he/she should select the appropriate methodology approach to successfully achieve the set objectives of the study. Cohen, Manion, & Morrison (2007) adds selecting the right methodology results in accurate findings. Basically, there are two types of methodology approach that a researcher can use, qualitative and quantitative. The choice between the two approaches solely depends on the type of research being undertaken. The researcher opted for quantitative approach. This approach was selected because it allows the researcher to apply questionnaire in gathering from many participants. Creswell (2003) agrees questionnaires are methods of data collection that encourage gathering of data via conducting oral interviews, written interviews also called questionnaires while maintaining consistency of the methods of data collection throughout the exercise. Choosing this approach was also greatly influenced by its ability

to test the current state of affairs on various hypothesis developed in the past. The test questions and tests were structured such that one test question about how supply chain in the hospital is carried out was asked to many participants in the same way and the variations in their responses measured for analysis. More so, use of questionnaires enabled the researcher to use descriptive analysis is designed to generalize findings made in the sample to the whole population. This, in turn, makes this method cheaper in terms of the cost of research and also faster in that less time is used in the survey and research.

3.5 Sampling

Creswell (2003) described sampling simply as the entire process of choosing a sample of the population as a representative of whole population in study and the findings generalized to represent the whole population. Therefore, the 263 participants were carefully selected as the unit to represent the entire population bearing in mind the difference in background. Researchers greatly differ on what are the main components that enhance the quality of a sample and an opinion held by many researchers notes that to get a more reliable sample you have to make the sample size large enough. Ernest (1994) noted that the quality or accuracy of findings from a sample wholly depended on the variations in background of the population, the nature of data being sought and the availability of the resources for the data. From the two lines of thought, the researchers were able to deduce that the sample size must be drawn from a good size of the population while also respecting the differences in population backgrounds and making this perception represented. Sampling was done through purposely sampling of the hospital employees as the researcher did select hospital staff based on their place and

position at the hospital.

3.7 Survey questionnaires

Ernest (1994) explains that a questionnaire is a method of data collection from a relatively large group to describe current events and characteristics of a population at a given time. Therefore, a questionnaire hopes to collect a big volume of data from a varied population and gain results that are reliable within a short period of time and using relatively few resources. Questionnaires give high quality of information that is accurate because the interpretation of the questions is accurate as there are no misinterpretations due to varied spoken accents (Creswell, 2003).

3.8 Data collection technique

As mentioned earlier, questionnaires were used to collect data from the participants at the hospital. The process of data collection took a total of two weeks. Questionnaires were sent to the participants in advance and they were constantly reminded through Short Code Messages. The questionnaire was made of a total of five sections. The respondents were accorded one week to complete the questionnaire starting from 18 September, 2017 to 25 September 2017. After the completing the questionnaires the respondents returned the questionnaire to the researcher who checked them to ensure that they were correctly filled.

The questions asked included (see appendix):

- Gender
- Marital status
- Education status

- Department
- Years of experience
- Position in the organization

The participants who took part in the survey those aged above 20 years with an education level of at least primary education and should be employed in an organization.

3.9 Data analysis

Data analysis for the present study was done using descriptive quantitative research that has been carried out. As such, a statistical application (Statistical Program for Social Sciences (SPSS) was applied in measuring and analyzing quantitative data. similarly, data grouping on the basis of data collected for instance supply methods used and type of drug bought. The questioned from the questionnaires were summarize in tables and graphs for easy understanding of the findings. Descriptive analysis was as well used to explain the various findings.

3.9 Data Validity and Reliability

In order to maintain data validity and reliability the researcher scrutinized to ensure that data collected was free of errors. This involved sorting, editing and cording the data for reliability that eliminated discrepancies and possible omissions that could have hamper the process of making conclusion. Maintaining data validity and reliability is necessary as it helps the researcher to get factual findings that are able to fully answer the aim and objective of the research.

3.10 Ethical consideration

Ethical consideration is necessary when undertaking any study because it involves

confidentiality and privacy of participants. Accordingly, the researcher adhered to the ethical code of the university as well as scientific ethic that guides a research. To this end, the researcher adhered to these ethics by informing the participants about their rights to opt out of the study through emails send with the questionnaires. Similarly, the participants were informed that the findings of the study were only meant for the research, and the information collected was handled with a lot of confidentiality as a way of protecting personal information. Lastly, the questions in the questionnaires were formulated in a way that does not ask private or sensitive information of both the organization and the participant.

CHAPTER FOUR

Data Analysis and Presentation

Introduction

The main aim or objective of a research is to find out the relationship between the written facts and the respondents' opinions from the field and relating of the two corresponds. In this chapter, the data collected from the field was sampled, keyed in, analyzed and presented as seen below. The results are presented in form of pictures and figures. The pictures and figures basically contain graphs and tables with the analyzed data. This chapter is presented into categories with which the data was collected and manipulated for instance; the demographic data analysis followed by the main research questions analysis sections. The main objective is to look into the supply chain management in health care industry peering into the factors, impacts, cost profit and remedies of the same.

4.0 Demographic information

Under this section, the general data analysis including gender, education level, and position in the organization, age, and experience of work are presented. This set of data was considered as it could assist the researcher to determine the relationship between the general information in the organization and the major objectives of the study for instance if there is any relationship between the level of education and the effective of supply chain management in the organization.

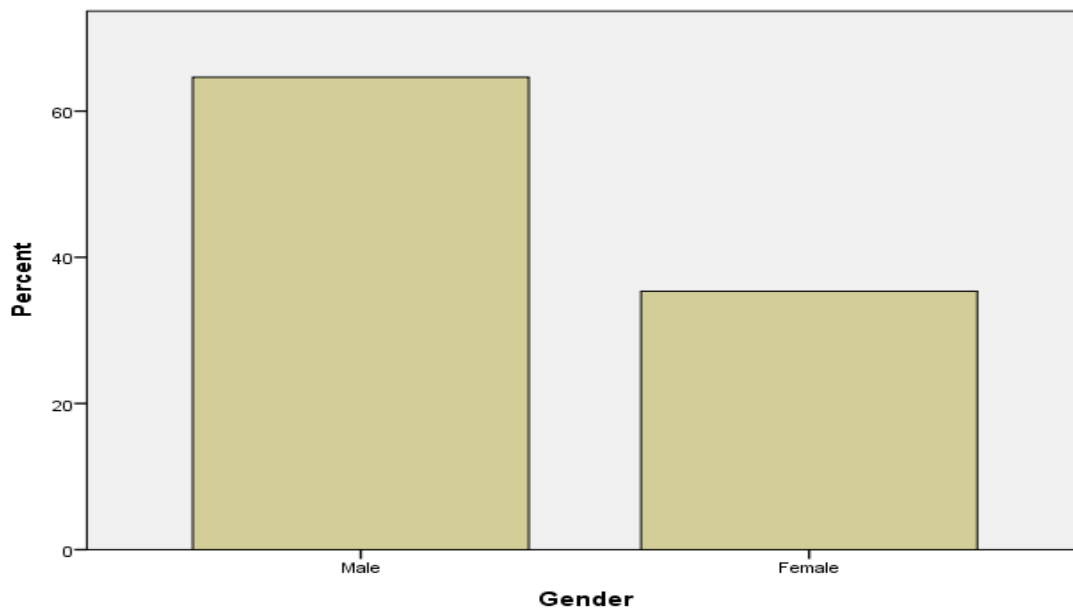
4.0.1 Gender

Data on the gender of respondents was collected as either male or female where male were represented by 1 and female by 2 for the ease of analysis. The results showed that 170 respondents were male and 93 respondents were female. These represent 64.64% and 35.36% respectively of the respondents who answered the questionnaire. This is probably because the ratio of male medical practitioners to female practitioners in the Apollo hospital is higher thus the huge difference. The table below shows the presentation of the above information in an easily understandable form.

Respondents' Gender

Gender		Frequency	Percent	Valid Percent	Cumulative Percent
	Male	170	64.6	64.6	64.6
Valid	Female	93	35.4	35.4	100.0
	Total	263	100.0	100.0	

The above information was also presented in a bar chart as shown in figure below.

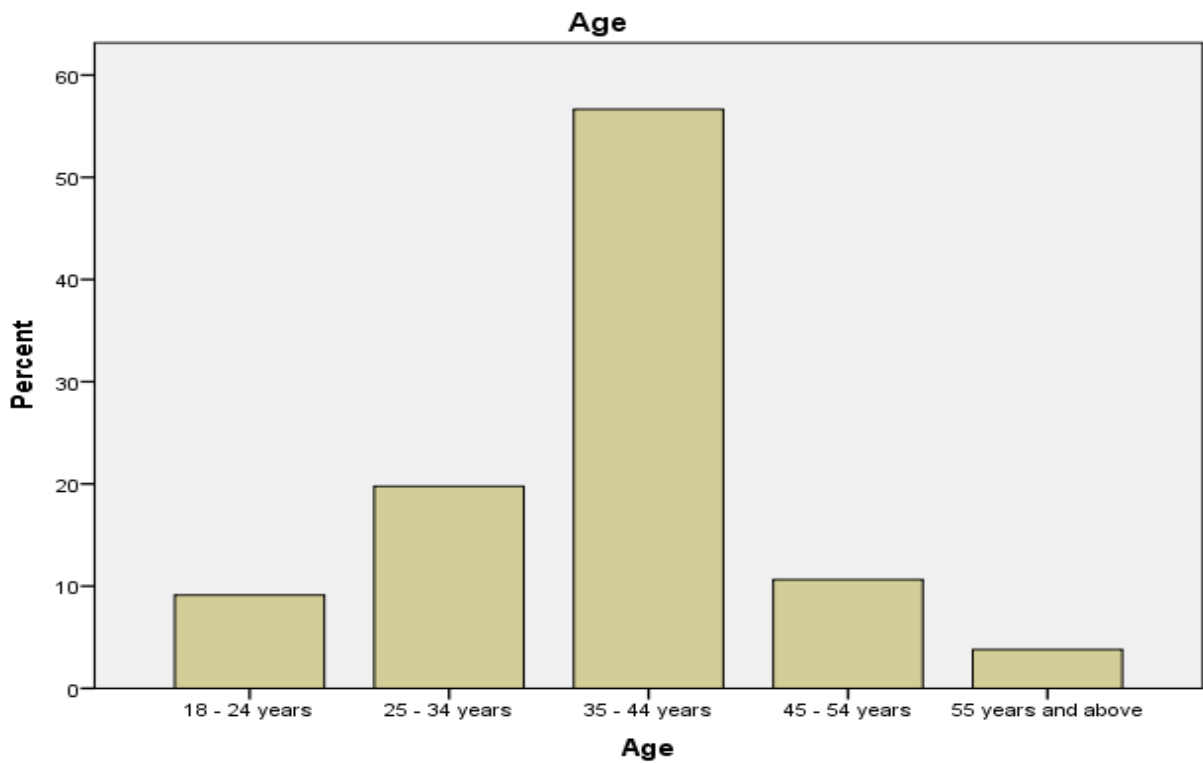


4.0.2 Age

The researcher then went ahead to look at the respondents' age. The researcher wanted to know the age of most medical practitioners in the hospital. This piece of information is important since it can determine a person's experience as age and experience in line. The results were as shown in the table below. The highest percentage of the employees was those from 35 to 44 years old. This is probably because the employees considered are of a higher education level and thus it takes time to attain such qualifications hence the projection of the number of employees and their age. The least was those with 55 years and above. This period, most employees are retrenched and just a few are left to issue advance and help in decision making process of the organization. The table below shows the presentation of the above information in an easily understandable form

Age	Frequency	Percent	Valid Percent	Cumulative Percent
18 - 24 years	24	9.1	9.1	9.1
25 - 34 years	52	19.8	19.8	28.9
35 - 44 years	149	56.7	56.7	85.6
Valid 45 - 54 years	28	10.6	10.6	96.2
55 years and above	10	3.8	3.8	100.0
Total	263	100.0	100.0	

The above information was also presented in a bar chart as shown in figure below.



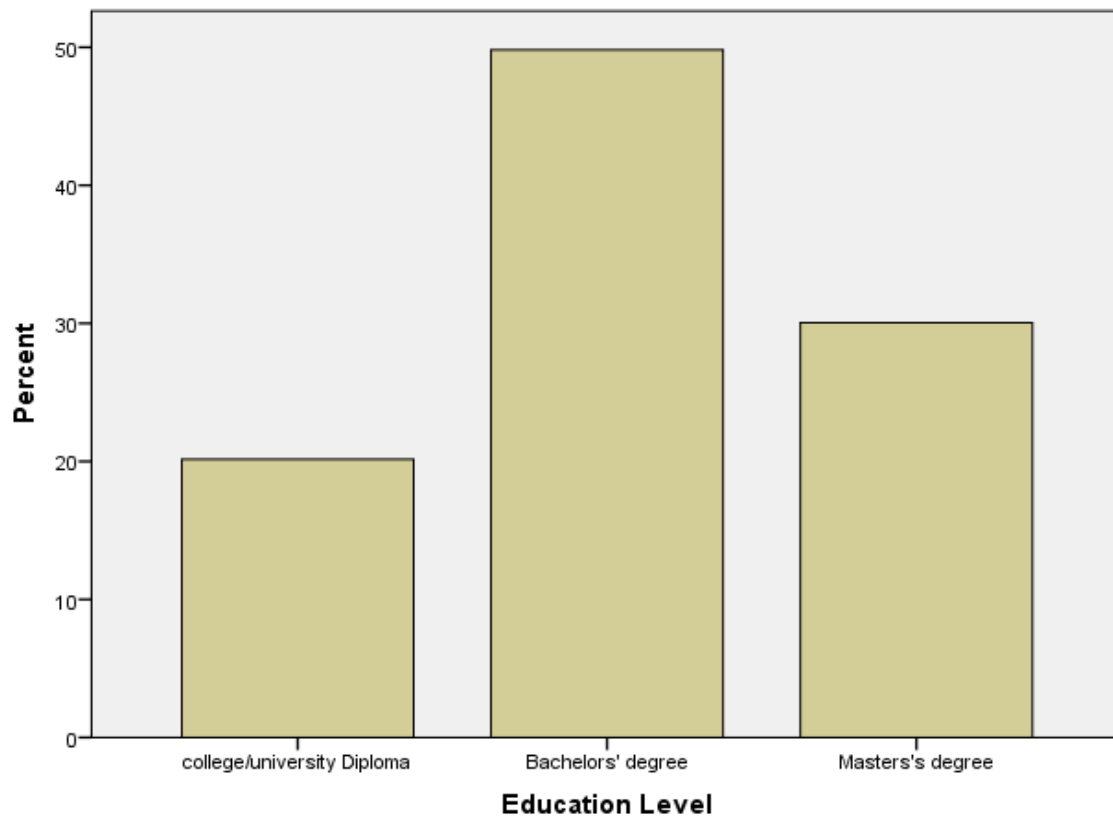
4.0.3 Education level

The researcher further went ahead to look into the education level of the respondents. This information is critical as there is a relation between the education level and the means of management of an organization for instance, the supply chain management for the hospital. The researcher therefore analyzed the set of data collected and the results were as shown in the table.

Education Level	Frequency	Percent	Valid Percent	Cumulative Percent
college/university Diploma	53	20.2	20.2	20.2
Valid Bachelors' degree	131	49.8	49.8	70.0
Masters' degree	79	30.0	30.0	100.0
Total	263	100.0	100.0	

The biggest number of participants was that of respondent with a bachelor's degree education level. This is probably the highest number as most of the employees and qualifications are always required to have this level of education except the few job opportunities that they always require either a college/university diploma or a master's degree.

The information above was as well presented in a pictorial form of a graph as shown below.



4.0.4 Work experience in the hospital

When collecting the general information, the researcher also wanted to determine the work experience of the respondents who provided the information. Work experience in the organization can affect the effective way of supply chain management as an employee or a manager with a higher experience has the organizational needs on his or her fingertips. This piece of information was as well important to the research objectives of the study.

The data was collected and analyzed as showed in the table below.

Work experience	Frequency	Percent	Valid Percent	Cumulative Percent
1 to 5 years	105	39.9	39.9	39.9
6 to 10 years	66	25.1	25.1	65.0
Valid 11 to 15 years	40	15.2	15.2	80.2
over 16 years	52	19.8	19.8	100.0
Total	263	100.0	100.0	

From the table above, it is evident that most employees in this hospital are those with a work experience below 5 years. Followed by those with 6 to 10 years' experience. This is because the organization frequently employs new and young workers who are fresh from the universities. This is to impact the new knowledge in the organization and to create a huge relationship between the experienced and the less experienced which explains the huge number of those with over 16 years' experience.

The information was as well reflected in the pictorial graphical form shown in the figure below.



4.0.5 Work Category

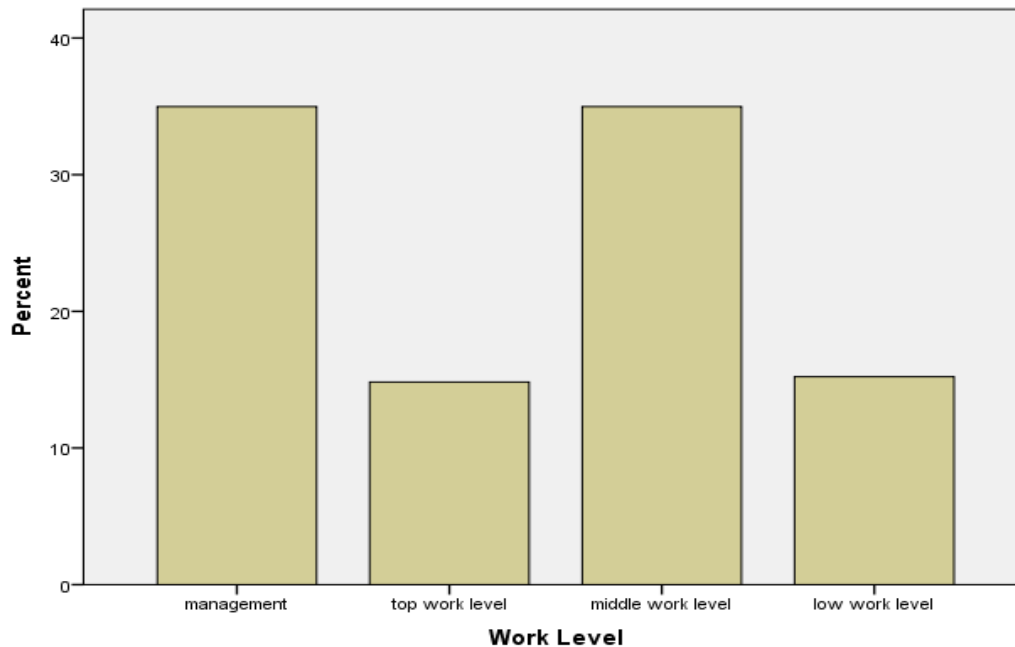
Finally, under the demographic information, the researcher collected data about the category with which the employees fall under in the organization. The employees were to fall under either, management level, top work level, middle work level and the low work level.

The data collected was revealed in the table below.

Work Level	Frequency	Percent	Valid Percent	Cumulative Percent
Management	92	35.0	35.0	35.0
Top work level	39	14.8	14.8	49.8
Valid Middle work level	92	35.0	35.0	84.8
Low work level	40	15.2	15.2	100.0
Total	263	100.0	100.0	

It is evident from the table that the highest number of employees is at the middle work level and at the management level. This is because generally most workers are normally at the middle work level in an organization. There were many respondents at the management level as the study targeted managers since they are the ones who could provide the most appropriate set of information that best suits the study objectives and questions.

The figure below shows a graph representing the piece of information presented in the above table.



4.1 Supply chain management operational factors of supplies

Alongside the demographic information captured, the researcher towards attaining the main goals and objectives of the study looked at the supply chain management operational factors of supplies within the hospital. Under supply chain management operational factors, there are various issues involved for instance; ensuring time delivery, alert customers on product delivery and proactive and systematic in terms of supply chain. The researcher's quest was therefore to determine the supply chain management factors in the hospital. Data on various factors under the same was collected and keyed in where the respondent was to rate by either strongly disagreeing, disagreeing, agreeing or strongly agreeing. This was in a form of a like scale where a strong agreement with this factor represented a 4 while strong disagreement represented a 1. A mean was determined where

all the summations including all the factors score according to the respondents' replies were done. The figure below shows a summary of all the mean value of the results.

Descriptive Statistics	N	Range	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
supply chain management operational factors mean	263	3.00	2.3878	.05312	.86148	.742
Valid N (list wise)	263					

In the table above, the mean score of all the supply chain management factors of the hospital operations is (mean = 2.39). This means that most respondents said that supply chain management factors are not well done and thus disagreeing with the factors presented to them by the researcher. The quality of service under the supply chain management in the hospital is therefore not to the standard level required according to the data collected and analyzed. There was a standard error of (S.E = 0.053). This implies that the mean is not so far away from the real value from the field. The standard error measures how far the mean is from the true facts in the field. The lower the standard error the more accurate the mean is. There was a standard deviation of (S.D = 0.86). The range as shown in the table above simply means the difference between the highest entry and the lowest entry. In this case the highest entry was 4 which meant, strongly agree while the lowest entry was 1 which meant, strongly disagree thus, a range of (range = 3).

4.2 The impact of supply chain management of consumables and non-consumables on healthcare service delivery

Service delivery in any organization, for instance a hospital, in this case, depends on the availability of necessary products required to give the services. Supply chain management in an organization determines whether products needed to satisfy the process of service delivery are available as required and in time. This thus determines the final service delivery to the patients by the medical practitioners. In this section, the researcher wanted to determine the impacts of supply chain management of both consumable and non-consumable products on the service delivery quality to the patients. Just like in the previous section, the researcher came up with a set of impacts that can result from the supply management process affecting service delivery. The respondents were to respond by strongly disagreeing, disagreeing, agreeing or strongly agreeing. This was in a form of a Likert scale where a strong agreement with the factor represented a 4 while strong disagreement represented a 1. After the collection of data, the researcher sampled and analyzed it by finding the mean value of all the impacts as per the respondents' data. The table below shows a summary of the data collected and analyzed in this section.

Descriptive Statistics	N	Range	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Impacts of supply chain management on service delivery mean	263	3.00	3.2779	.05470	.88704	.787
Valid N (listwise)	263					

The mean of all the effects of supply chain management on health service delivery was (mean =3.37) which means that most respondents agreed to the fact that most impacts of Supply chain management, at some point affect the quality of service delivery in the hospital. The standard error of the mean was (S.E = 0.055) which means that the actual mean was not far from the real factual data from the field, the lower the standard error, the more reliable and accurate the mean. The results in the above table had a standard deviation of (S.D = 0.89) which means the dispersion of the respondents' values were that far from the mean. The lower the standard deviation the more close the collected data are to the mean and the more accurate the data is. just like in the previous section, the range as shown in the table above simply means the difference between the highest entry and the lowest entry. In this case highest entry was 4 which meant, strongly agree while the lowest entry was 1 which meant, strongly disagree thus, a range of (range = 3).

4.3 Cost savings that arises from implementation of supply chain management

A proper supply chain management in an organization like in a hospital helps greatly in determining how cost effective acquiring of products can be. The main goal of an organization is to maximize on the profit and minimize on the cost. This study thus further went ahead to look into some of the ways with which some proper means of supply chain management can lead to a cost saving strategy. Just like the previous sections, the respondent was to either agree or disagree depending on the question asked. The table below shows the results obtained from the research.

Descriptive Statistics	N	Range	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Cost savings that arises from implementation of supply chain management mean	263	3.00	3.0095	.05384	.87311	.762
Valid N (list wise)	263					

The mean was (mean = 3.01) meaning that most of the respondents agreed that indeed cost saving arises from proper supply chain management methods. The researcher thus made a conclusion that profit maximization arises from the use of proper supply chain management. The standard error was below (S.E = 0.05) meaning that the study obtained a reliable mean score. The standard deviation revealing the dispersion of data from the mean

value was (S.D = 0.87) thus the data was not widely dispersed. This still proves the accuracy of the data collected.

4.4 Ways in which hospital can improve its supply chain management practices

A research is not complete if a researcher does not look into the ways with which a problem can be remedied. This study thus finally looked into some of the ways that the hospital as an organization can use to improve the supply chain management practices. Most respondents replied that by ensuring that the appropriate protocols are followed when carrying out these practices, the supply chain management will be improved. Some of the stated processes to be streamlined in order to come up with appropriate chain management practices include, proper tendering, purchase of the quality product, avoid mismanagement of funds and acquiring the most appropriate products and avoiding the unused products that are still in stock. These were the most frequent answers from the respondents thus reported.

4.5 Hypothesis testing and descriptive analysis

After collecting and sampling the data into different categories, the researcher went ahead to test the study's hypothesis and to determine whether it is a true or null hypothesis

Using a special statistical package (SPSS), the researcher correlated the main variables for the purposes of identifying the goals of the study and in order to certain the hypothesis; supply chain management factors have an impact on the service delivery of the hospital.

The table below show the result of the Pearson's correlation carried out.

Correlations		Impacts of supply chain management on service delivery mean	supply chain management operational factors mean	Cost savings that arises from implementation of supply chain management mean
Impacts of supply chain management on service delivery mean	Pearson Correlation Sig. (2-tailed) N	1 263	.734** .000 263	.328** .000 263
supply chain management operational factors mean	Pearson Correlation Sig. (2-tailed) N	.734** .000 263	1 263	.350** .000 263
Cost savings that arises from implementation of supply chain management mean	Pearson Correlation Sig. (2-tailed) N	.328** .000 263	.350** .000 263	1 263

** . Correlation is significant at the 0.01 level (2-tailed).

Focusing on the goals and objectives of the study, as well as the hypothesis, the two factors; supply chain management operational factors and impacts of supply chain management on service delivery will be interpreted. In the table, the highlighted values represent a 73.4% of correlation between the two major variables. it is a positive correlation meaning that an increase on the operational factors leads to the increase on the impacts on service delivery. This is proven to be statistically significant since the significant value (P = 0.00) is below the determining value of 0.01. a true hypothesis is thus adopted that indeed the supply chain management operational factors have an impact on service delivery in the hospital being studied.

4.6 Multinomial logistic regression

For more inferential statistical analyses, the researcher went ahead and performed a multinomial logistic regression where the two main variables that correlated in the previous analysis were used; the dependent and independent variable. The results were obtained as seen in the table below.

Likelihood Ratio Tests

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	30.315 ^a	.000	0	.
Supply chain	113.511	83.196	9	.000

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

The chi square revealed that the relationship between the two variables was 83.2% with a significant value of 0.001 meaning that the above test can said to be statistically significant following the significant value which was 0.005. the hypothesis can therefore be proven that indeed supply chain management factors have an impact on the service delivery in the hospital. The significance of this analysis is to proof the significant of the collected data including the relevancy of the data to the field and how it can be used to represent the actual information.

CHAPTER FIVE

DISCUSSION OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

Chapter five of this study gives an overview of the general findings of the effects of supply chain management factors on the service delivery of the Apollo hospital. The chapter gives an in- depth discussion of the study findings in relation to the research objectives and questions, theoretical framework and literature review. Conclusions are then drawn from the study and recommendations made for policy and further research in fulfillment of the fourth objective of the study on suggesting possible ways of responding to and justifications of better means of supply chain management of the hospital to ensure proper channeling of products.

5.1 Discussion of findings

The main objectives of this study were to determine the main impacts of supply chain management factors on the health service delivery of the Apollo hospital. There were various factors brought up relevant to the research topic. All these could help the researcher in collecting the possible and most relevant data for the research. All the data were analyzed as seen in the previous chapter . the researcher thus in this chapter discusses the finds of the research according to the objectives of the study.

5.1.1 Impacts of supply chain management factors on the health service delivery in the hospital.

From the literature previous, past researches and studies done on the impacts of supply chain management of any organization's output in terms of service delivery and products.

Most researchers witnessed that poor supply chain management practices and methods for instance in a hospital environment here various products are required for the purpose of smooth running. The researcher thus went ahead to collect relevant data from the staff members of the hospital as the respondents and collected all the relevant data to the study questions. The researcher formed a hypothesis (H_1 : supply chain management factors have impacts on the health service delivery in the hospital), which was tested after the data collection and analysis. The hypothesis formed the basis of the research and could tell if the research findings are in line with the other previously done studies related to the research. After the data analysis, the researcher found that the two major variables of the study were statistically correlated to each other. A true hypothesis was landed at after the results revealed that there is a correlation between the two variables. An increase in how the supply chain management is done in the hospital leads to an increase in the service delivery capabilities to the patients and other clients as well. Just like the previously done studies, the researcher proved that indeed some factors that fall under supply chain management in any organization impacts on the level and quality of service delivery. Some factors under supply chain management in an organization like time and resources of product delivery, shipment factors, product alert and product information to the consumers are some of the factors that fall under supply chain that affect the availability of both consumable and non-consumable products that impact the quality of service delivery.

In conclusion, the research was summarized by confirming that indeed there must be proper methods and factors of supply chain management in an organization for it to

deliver best services. This was in line with almost all the sources in the literature review that the researcher consulted before the research. The reliability of the data collected was checked, for instance, by determining the standard errors and standard deviations which confirmed that the data was reliable to the actual reality in the field and with very minimum errors. The findings thus can be considered by any future researchers or organizations that might be in need of such information.

5.1.2 Cost savings resulting from better supply chain management and remedies

It was an obligation of the researcher to look into some of the cost saving benefits that result from better means of supply chain management in an organization. This could reveal to the target audience of the research the importance of transparency when dealing with the management process of supply chain. Factors like saving on resources including capital and time, ease in monitoring and regulating security issues of the products, and ease in tracking the products from the supplier to the destination are some of the cost saving benefits that the researcher looked at. All these were found to be indeed true as most respondents strongly agreed that they result from proper means of supply chain management. The researcher also wanted to find out, according to the respondents, better remedies that can be considered in order to improve the cost saving which results from proper supply chain management factors.

Respondents replied by saying that this can be made better through; proper management of funds in the organization for instance, the organization should make sure that they are accountable and all their accounts balance according to the expenses, the management also be able to channel most capital towards acquiring most used products and minimizing

their cost on constant unmoving products. Proper methods of procurement and determining suppliers should also be considered during the process of supply chain management. Other small factors like proper transportation and security and monitoring if also are considered, the supply chain management will be successful thus best quality of service delivery.

5.1.3 Conclusion and recommendation

The study has looked at supply chain management in health care industry with specific focus on Apollo Hospitals, a global facility that provides services to many people across different countries. The research centered mainly on the formulated objectives; to establish the supply chain management operational factors of supplies at Apollo Hospitals; to examine the impact of supply chain management of consumables and non-consumables on healthcare service delivery at Apollo Hospitals; to examine the cost savings that arises from implementation of supply chain management at Apollo Hospitals; to determine ways in which the hospital can improve its supply chain management practices. To achieve these objectives, a literature review was undertaken that was followed by a primary study of Apollo Hospital.

From the above research, data collection, analysis and findings, the research concludes that indeed supply chain management factors in a hospital have an impact on the quality of service delivery to the target audience. Therefore, it is recommendable that alongside Apollo Hospital, all other organizations should consider the above named remedies to proper supply chain management factors. The researcher would also recommend that in case of future studies on the same, the researchers should look into factor that lead to

insecurity of the entire process of supply chain, and how to improve the supply chain management factors in any organization. most previously done studies focuses on poor methods applied during the process of supply thus living the above research gap.

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APPENDIX 1:

QUESTIONNAIRE

Please fill in the questions by checking in (✓) the correct answer. Please answer all questions

All the data collected will be used only for the purpose of the study.

PART A: Demographic profile

1. Gender

Male	
Female	

2. Age (Tick where appropriate)

18-24 years	
25-34 years	
35-44 years	
45-54 years	
Over 55 years	

3. Education level (Tick where appropriate)

College/University	
2 Diploma	
Bachelor's Degree	
Master's Degree	

4. How many years have you worked for the organization? (Tick where appropriate)

1-5 years	
6-10 years	
11-15 years	
Over 16 years	

5. Please indicate the category you fall under. (Tick where appropriate)

Top Management	
Middle level	
Low level	

Part B: Supply chain management operational factors of supplies at Apollo

Hospitals

Rate the following of supply chain management operational factors of supplies at Apollo

Hospitals where: Strongly disagree =1, disagree=2, Not sure=3, Agree=4, Strongly agree=5

The following supply chain management practices are practiced at Apollo Hospitals :

	1	2	3	4	5
1 We are proactive and systematic in the supply chain					
2 Track and trace products in the supply chain					
3 Alert customers on product availability					
4 Alert customers on status of shipment					
5 Timely delivery					
6 Reduce lead time					
7 Alert customers on late shipment					
8 Monitor carrier's activities					
9 Monitor regulatory and security issues					
10 We have ability to make mid-course corrections					

Part C: The impact of supply chain management of consumables and non-consumables on healthcare service delivery at the hospital

Rate the performance of effective supply chain management at Apollo Hospitals where:

Strongly disagree =1, disagree=2, Not sure=3, Agree=4, Strongly agree=5

Supply chain management has led to:

	1	2	3	4	5
i. Timely delivery of pharmaceuticals and non-pharmaceuticals					
ii. Perfect order fulfillment					
iii. Good line item fill rate					
iv. Lower order fulfillment lead-time					
v. Faster supply chain response time					
vi. Faster response to customer complaints					
vii. Lower cost of goods sold					
viii. Value added productivity					
ix. Reduced returns processing costs					
x. Faster cash to cash cycles					
xi. Lower inventory days of supply					

Part D: Cost savings that arises from implementation of supply chain management at the hospital

Rate the cost savings that arises from implementation of supply chain management at the hospital where; Strongly disagree =1, disagree=2, Not sure=3, Agree=4, Strongly agree=5

	1	2	3	4	5
The products are delivered on time thus time resource is saved					
It is economical to monitor regulatory and security issues					
It easier to alert consumers on the shipment period					
It is more efficient to track and trace products in the supply chain					
A reliable supply chain makes it easier and economical to transport the products to destination					

Part E: Ways in which hospital can improve its supply chain management practices

Out of your work experience, state some of the ways with which the hospital can adopt in order to improve its supply chain management practices.

Any other comments

Thank you.

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