Drug supply chain management practice and its influence on the performance of Amanuel Mental Specialized hospital

By

TIZITA REFERA

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Advisor

Matiwos Ensermu (MBA, PhD)

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DECLARATION

I declare that this thesis work entitled as **"Drug supply chain management practice and its influence on the performance of Amanuel Specialized Mental Hospital",** is my original work, prepared under the guidance of Matiwos Ensermu (MBA, PhD). All sources of materials used for the thesis have been all acknowledged. I further confirm that the thesis has not been submitted in part or full to any other higher learning institution for the purpose of earning any degree.

Declared by:-

Name: Tizita Refera

Sign:

Date: 30/05/2019

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LOGISTICS AND SUPPLY CHAIN MANAGEMENT

ENDORSEMENT

This thesis has been submitted to Addis Ababa University School of Commerce Graduate Studies for examination with my approval as a university advisor.

Matiwos Ensermu (PhD)

Advisor Signature Date date

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Drug supply chain management practice and influence on the performance of Amanuel specialized mental hospital

By Tizita Refera

College of commerce

Department of logistics and supply chain management

Approved by board of examiners

Advisor	Signature	Date
Matiwos Ensermu (PhD)	----------	----------
Internal examiner	Signature	Date
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External examiner	Signature	Date
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List of acronyms and Abbreviations

ASMH	Amanuel Specialized Mental Hospital
BPR	Business Process Reengineering
FMOH	Federal Ministry of Health
HEW	Health Extension Worker
IPLS	Integrated Pharmaceutical Logistics System
IT	Information Technology
JIT	Just In Time
PLMP	Pharmaceutical logistics master plan
PFSA	Pharmaceutical Fund Supply Agency
SC	Supply Chain
SCM	Supply Chain Management
USAID	U.S. Agency for International Development

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Abstract

Supply chain management that is correctly applied to the health institutions can contribute greatly to the availability of medicines which reaches to the end customers. Amanuel Mental Specialized Hospital is the only psychiatric specialized hospital in Ethiopia. So people are coming from all over the country for the treatment. The objective of this study was to assess the drug supply chain management practice and its influence on the performance of AMSH. The study employed both quantitative and qualitative study approaches. Quantitative data was collected from 70 employees using self administered questionnaire that was set in likert scale format, whereas, interview questions were also used to collect qualitative data from 7 key informants (chief executive officer, finance director, pharmacy director, clinical coordinator, drug supply manage rand store persons). Descriptive analysis method through statistical packages for social science (SPSS) version 21 software was used to analyze the data. The findings of the study showed that customer relationship, information and distribution management are well practiced in the hospital followed by inventory management. The rest facility and transportation management are practiced moderately. And the statistical finding of the result showed a significant influence of customer relationship and inventory management on organizational performance. So this study recommends working on customer relationship management and inventory management to improve the hospital performance in the case of customer satisfaction and cost reduction.

CHAPTER ONE

1 INTRODUCTION

1.1 Background of the study

In the global market place, in every business type in an organization, there is increased customer demand and competition. As a result, the organization should explore a new method to run their business and deliver what the consumer wants at the right time, right place, right quantity, and right condition in an affordable price. To meet the customer needs, organization should adopt supply and value chain management as a means of driving efficiency and delivering value (Treves, 2015).

Supply Chain Management (SCM) is "The management of upstream and downstream relationship with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole"(Christopher, 1998). Despite the supply chain management's goal being straightforward, the challenging part is decision making in order to design, plan and operate a supply chain in an efficient manner. One main concern is that centralized decision settings in a supply chain, are not always present in supply networks (Reiner, 2005).

With the world gradually evolving into a global economy, Africa is playing an increasing role both as a supplier and a consumer market for products from other parts of the world. So it is necessary for organizations to understand logistics and supply chain management practice in Africa. For firms that operate in Africa, it is crucial to understand to current state of logistics in the continent and has to differentiate the challenges in the system. Some of the challenges faced by countries in Africa are poor information, communication and consumption data, lack of quality assurance procedures and inadequate storage facility.

The pubic supply chain is very complex because of Ethiopia's large size and the expansive scope of the health program (USAID logistics hand book, 2011). The federal ministry of health has been working to ensure an efficient and high performing health care supply chain that will ensure access to affordable medicines for all the society. In the country supply chain challenges like inadequate quality and affordable essential drugs, poor storage conditions and weak stock management were faced by the organizations. To overcome these challenges pharmaceutical

fund and supply agency developed and implement the integrated pharmaceutical logistics system (IPLS) in 2009 (USAID/ DELIVER project, 2015).

On different literatures Supply Chain Management Practice defined in different ways. Among these, some of literatures defined it as follow: Li *et al*., (2005) define Supply chain management practice as an activity that takes place in an organization to promote effective management of its supply chain. Otto and Kotzab (2003) termed SCM practice as a special form of strategic partnership between retailers and suppliers. Alvardo and Kotzab (2001) viewed SCM practice in terms of reducing duplication effects by focusing on core competencies and using inter-organizational standards such as activity based costing or electronic data interchange and eliminating unnecessary inventory level by postponing customization towards the end of the supply chain.

Enhancing productivity, reduce inventory and lead time are the short term and increasing market share and integration of supply chain are long term objectives of SCM (Koh *et al.,* 2007).

Health status of the society is one main indicator of social development and progress. And the provision of the health care is a major challenge to human life (Jahanbani *et al.*2016). Among the few, accompanied with the new requirement of the society, the major challenge of the health care institutions is customer dissatisfaction and increased cost of the health care services. Because of these factors health care organizations are forced to adopt a new system in dealing with the increase in health service costing and gaining customers' dissatisfaction (Ali *et al.*, 2012).

SCM is one of the important functions that need to be performed efficiently in health care sectors. Efficient health supply chain performance is essential for assuring access to health supplies in particular medicines and thus for positive health outcomes (Mungu, 2013).

The fundamental success of SCM involves the effective coordination and integration of all the entities among the various supply chain partners for example supplier, distribution, inbound and outbound transportation, third party logistics company and information systems providers. Health care SCM differs from other application in terms of key elements as it tends to be misalignment high cost for health care providers and heavy dependency on third party (Lenin, 2014).

1.2 Background of the hospital

The Amanuel Mental Specialized hospital was established in 1938. It is the only psychiatry hospital in the country. Amanuel Mental Specialized Hospital/AMSH/ is one of the public hospitals administered under Federal Ministry of Health. AMSH is located in Addis Ketema sub city of Addis Ababa, Ethiopia. The hospital gives service averagely for 500 patients per day who are referred from different parts of the country. It also serves as a training institute for Psychiatry professionals to expand the service to the primary health care system of the country.

In AMSH one of the major services that give to the customer is the pharmacy unit. There are five pharmacies (community pharmacy, budget pharmacy, inpatient pharmacy, emergency pharmacy and ART pharmacy) that serve the inpatient and outpatient customers. It is the last service that is given to the outpatient customers. Medicine purchase is primarily from Pharmaceutical Fund Supply Agency (PFSA). The hospital also distributes medicines to other health centers, missionaries of charities like mother Theresa and Macedonian.

1.3 Statement of the problem

Well functioning supply chains to deliver medicines are critical for the provision of health services (Yadav, 2015). Research recently carried out by Munedzimwe (2014 cited in Bigdeli) found that for countries planning to increase the strength of the health systems, it is necessary to give a great attention to issues related to medicines. Public health supply chain is a complex network since it has contained a different health department medical stores and health facilities at various levels with service providers to ensure the availability of medicines to the people (John Snow, 2012). The causes of medicine stock out are too many as the supply chain for medicines is a complex process involving many stockholders (USAID: Delivery Project, 2011). In southern Africa, house hold surveys estimated that approximately 20% of patient's that visits to public health facilities are released without medicines due to stock outs and shortages (Wagenar et al., 2014).

Numerous researches were conducted to study the influence of the practice of supply chain management on organizational performance. From these researches like Lang L.Y. and Cheng L.T studied the effect of service supply chain management practice on the public health care organizational performance and found a positive relationship between them (Lang LY and Cheng

LT, 2012). Al Saada *et al.*, 2013 studied that supply chain management and its effect on health service quality.

In the case of Amanuel mental specialized hospital it encounters some problems in implementing the drug supply chain management with respect to organizational performance. According to the SWOT analysis done in the hospital the major problems in the pharmacy departments in relation to the supply chain are the following. The work is not patient centered because there is plenty of paper work of the auditable pharmaceutical transaction service and this result work load on the professionals, most of the time essential medicines for the hospital is stock out, bin cards are not properly filled out, there is lack of qualified personnel at the supply position, inadequate storage space for the medicines, no standardized shelves for the medicines, there is forecasting, procurement and quantification problem for the medicines to be purchased, and finally there is no standard operating procedures for purchasing purpose. So this and other unmentioned problems mitigate efficient and effective supply chain management practice in the hospital. Therefore this study tries to explain the drug supply chain management practice and its influence on the performance of AMSH.

1.4 Research question

The vital research questions that were addressed in this study are:

1. What is the drug supply chain management practice implemented in Amanuel Mental Specialized hospital?
2. What are the drug supply chain management challenges that are faced by AMSH?
3. What is the relationship between drug supply chain management practice and the performance of AMSH?

1.5 Objective of the study

1.5.1 Genera objective

- The general objective of this study was to assess the drug supply chain management practice and influence on performance of AMSH.

1.5.2 Specific objectives

- To assess the current practice of drug SCM
- To assess the challenges of drug supply chain management of AMSH
- To Show the effect of drug SCM practice on hospital performance

1.6 Significance of the study

The study has a contribution for the health care institutions to practice supply chain management in an efficient and effective way. In addition to this it helps Amanuel hospital to differentiate the challenging part in applying the SCM. This will result for the continuous availability of medicines in the pharmacy at the right time in an affordable price. Lastly it helps the researcher for the partial fulfillment of the requirement for the degree of masters in logistics and supply chain management.

1.7 Scope of the study

Supply chain management covers a wide area and it was difficult to do the study in all areas that summarizes supply chain management in terms of time and finance. For this reason the scope of this study focuses on only the effect of drug supply chain management practice on the performance of Amanuel mental specialized hospital. The scope is delimited to the supply chain management practice of inventory management, transportation, quality of information sharing, facility management, distribution management and customer relationship management. In terms of the hospital performance the study is delimited to customer satisfaction and cost reduction only. Finally the area of the study is delimited to Amanuel specialized mental hospital only.

1.8 Limitation of the study

The major limitation of the study was the lack of cooperation of the respondents especially the key informants and their commitment to fill the questionnaires. The other limitation of the study was it doesn't include all the supply chain management participants such as PFSA and this factor limits the outcome of the research.

Since SCM practice covers a wide area, it was very difficult to cover all in this study because of time constrained. So it couldn't be applied to the complete chain of the hospital under investigation.

Finally since this study is limited to some of the components of the SCM practice and to one hospital only, it might be difficult to apply to other health institutions.

1.9 Definition of terms

Drug/ Medicine

Drug" means any substance or mixture of substances used in the diagnosis, treatment, mitigation or prevention of a disease in man or animal. This shall include narcotic drugs and psychotropic substances, pesticides, animal food additives, poisons, blood and blood products, vaccine, sera, radioactive pharmaceuticals, cosmetics and sanitary items, medical instruments and medical supplies. (EFMHACA Drug Administration and Control Proclamation No. 176/1999)

Supply Chain Management

It is management of upstream and downstream relationship with suppliers and customers in order to deliver superior customer value at less cost to the supply chain as a whole (Martin Christopher).

Supply Chain Management Practice

It is a practice of supply chain management that include supplier relationship management, customer relationship management, demand management, information and technology management. (Samuel K.)

Organizational Performance

It involves analyzing the company's performance against its objectives and goals. In other words organizational performance comprises real results or outputs compared with intended outputs.(https://marketbusinessnews.com/finincial-glossary-organizational-performance-defination-meaning/) (Accessed on Jan 2, 2019).

1.10 Organization of the study

This study contains five chapters. These chapters are constituted as follows.

Chapter 1: Introduction- In this chapter background of the study, back ground of the hospital, statement of the problem, research questions, general and specific objectives, significance of the study, scope of the study, limitation of the study and definition of terms are included.

Chapter 2: Literature review- this chapter of the study includes review of other author's articles, related literature about the subject matter and conceptual framework of the study.

Chapter 3: Research methodology- this chapter comprises study area and study period, research design, target population, method of data collection and research instrument, reliability test, method of data analysis and ethical consideration.

Chapter 4: Analysis, interpretation and discussion of the results- this chapter includes the analysis and interpretation of the respondent's response from the software package (SPSS) and discussion of the result.

Chapter 5: summary of major findings, conclusion, recommendation and suggestion- this chapter includes conclusion, recommendation and suggestions for further research.

Finally the study contains the reference and appendices.

CHAPTER TWO

2. LITERATURE REVIEW

The purpose of this proposal is to examine the pharmaceutical supply chain practice and effect on performance of Amanuel specialized mental hospital. The intention of this section is to review previous work in the area of health sector supply chain and its influence on performance of the public hospital. The reviewed literature covers supply chain management, pharmaceutical chain in developing country, pharmaceutical supply chain in Ethiopia, pharmaceutical supply chain in public hospitals, supply chain management practice and organizational performance, factors affecting the health care supply chain, challenges of supply chain management and conceptual framework of the study.

2.1. Theoretical Literature Review

2.1.1. Supply Chain Management

In the current globalization, customers to maintain their supply of materials they have to build relationship with their suppliers and practice effective supply chain management (Schoenfeldt, 2008).

Before emerging of the term supply chain management in the late 1980's and came into widespread use in the 1990's, management was used for business terms such as logistics and operations. Some definitions of supply chain are:-

- As Douglas, L. M., Stock J.R., Ellram L.M., 1998 stated that supply chain is the alignment of firms that bring products or services to market
- As Chopra and Meindl, 2001 SC consists of all stages involved directly or indirectly, in fulfilling the customer's request.
- As Ganeshan and Harrison, 1995 defines SC as a network of facilities and distribution operations that performs the function of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers.
- As Waters. D a SC is the series of activities and organizations that materials both tangible and intangible move to their journeys from initial suppliers to final customers.

In general supply chain is a network of partners who changes a basic good (upstream) into the final product (downstream) which has a value for the end-customers. Each participant in a SC is responsible for the process that converts inputs (materials and information) into an output (goods and services). And supply chain management is planning and controlling of all the business process from end customers to raw material supplier that link together partners in order to serve the needs of the end customer (Kot, 2013; Harrison and Hoek, 2013).

The main objective of SCM is optimizing the performance of the chain to add much value for the least cost possible to jointly link all the SC partners and cooperate with in the firm (Finch, 2006). In addition as Mentzer, 2001 explains the objective of SCM is to improve the long term performance of the individual firm and also as a whole the SC. Further the importance of SCM in boosting customer service; reduce operating cost (purchasing, production and total supply chain cost) improving financial position, improving quality of life, ensuring human survival, improving standards of living (http://www.scm.globe.com/five-supply-chain-drivers). (Accessed on Jan2, 2019)

In the case of the health sector SCM is important to decrease the cost of medication and equipment, in ensuring full supply, in preventing wastage, increase demand of quality health care and increasing the performance of the hospital in giving services to the patients resulting in turn in improved customer satisfaction (Lang LY and Cheng LT, 2012).

2.1.1.1 Drivers of supply chain management

Decisions are made regarding the five drivers of SC in order to get SC capabilities. And these drivers are developed and managed to emphasize responsiveness or efficiency.

The five drivers of supply chain are:-

- Production (what, how and when to produce)

Building organization with greater capacity, use of flexible manufacturing technique and producing smaller firms closer to the customer can make this driver responsive. A supply chain can gain efficiency by producing centralized large plants to get better economies of scale.

- Inventory (how much to make, how much to stock)

In this driver responsiveness can be gained by stocking high levels of inventory for a wide range of products and by stocking products at many locations. Efficiency can be gained by having small inventory of necessary items only.

- Location (where best to do what activity)

By establishing many locations that are close to its customer's responsiveness can be achieved. It can obtain efficiency by operating from only a few locations and centralizing activities in a common location.

- Transportation (how and when to move products)

Using flexible transport system responsiveness can be gained. It can obtain efficiency by transporting products in large quantities of same batch and doing it less often using transportation modes like ship, railroad and pipelines.

- Information (basis for making these decisions)

This driver is very useful to enhance the performance of the other four supply chain drivers. Responsiveness can be achieved by collecting and sharing accurate and timely data used by the other supply chain drivers. Organizations that make effective use of information to increase coordination internally and externally with their supply chain partners will gain the most customers satisfaction and will be most profitable (http://www.scm.globe.com/five-supply-chain-drivers). (Accessed on Jan2, 2019)

2.1.2 Supply chain management practice

SCM practice was defined in various ways by various authors.

Table 2.1: list of Authors and definition provided for SCM Practice

Donlon(1996)	A practice that include supplier partnership, outsourcing, cycle time compression, continuous process flow & information technology sharing.
Otto & Kotzab(2003)	As a special form of strategic partnership between retailers and suppliers
Alvarado & Kotzab(2001)	In terms of reducing duplication effects by focusing on core competencies & using inter-organizational standards.
Li et al(2005)	As a set of activities in an organization to promote effective management of the supply chain
Koh et al(2007)	As close partnership with suppliers & customers, JIT
Tan et al(1998)	Supply chain practice includes purchasing, quality & customer

	relationship
Ellram, Tate, Billington(2007)	Identified seven theoretical processes of service supply chain which include information flow, capacity & skills management, demand management, customer relationship management, supplier relationship management, service delivery management & cash flow
Chong et al(2010)	Categorized SCM practice into demand management, customer relationship management, supplier relationship management, capacity & resource management, service performance, information & technology management, service supply chain

Source: lee *et al,* 2011

From the above definitions, it can be concluded for SCM practices that are suitable to public health care are supplier relationship management, customer relationship management, demand management, information and technology management (Samuel k.k., 2012).

2.1.3. Pharmaceutical supply chain in developing country

Pharmaceutical SC is the integration of all activities mainly selection, quantification, procurement, warehousing and storage, distribution and serving customer. From the challenges that are faced by the developing countries concerning of the drug SC are of poor information, communication and consumption data, lack of quality assurance procedure and inadequate storage facility (Burn, 2013).

A study carried out in Kenya suggested that market price fluctuations was identified as the most challenging factors that could affect the level of essential drugs in the health facilities and it was indicated that the practiced procurement activity was not effective in reducing the cost of the drugs (Mungu , 2013).

Samuel K.K., (2013) also researched on Kenya medical supply agency and found poor infrastructure, bulky materials to be transported, uncertainty in terms of demand, lack of cold chain maintenance and lack of qualified personnel as major and least challenges of SCM. Additional challenges like lack of facility level data to decision makers at higher levels, delivery delay, stock out, irregular ordering cycle, wastage and expiry was found by the study carried out in Tanzania for applying the supply chain integration (USAID, 2011)

2.1.4. Pharmaceutical supply chain in Ethiopia

In Ethiopia the public health supply chain are very complex because of the country's large size and the expansive scope of the health program (USAID logistic handbook, 2011). In the 2004 national assessment, a number of challenges like missing entities in the SC which contribute to poor performance were identified in the existing public health supply chain. In addition having multiple levels which lead to long lead time, having non-value adding activities at every level of the sc which leads to confusion about roles, having fragmented procurement which leads to lack of coordination and having poor information sharing was identified as a big challenge. (USAID/DELIVERY, 2011) To address these challenges the Ministry Of Health undertook initiatives by developing the pharmaceutical logistics master plan and business process reengineering in 2005 and 2006. The PLMP ensures availing the right medicines of high quality at public health sector facility at the right time, in the right quantity in a reduced cost. BPR approach, with PFSA, by reorganization and consolidation of logistics function the country will try to improve efficiency and effectiveness of its SC. The process includes measuring cost, quality, service and speed to achieve performance (USAID, 2011).

Delivering high quality health care to patients requires health facilities and dispensaries to have a full supply of drugs to achieve a well functioning sc. Since 2006 the USAID/delivery project and delivery supported the FMOH in Ethiopia to improve its pharmaceutical sc and availability of medicines for its people. Over this period availability of essential drugs has increased.

In Ethiopia interventions like strengthen logistics system performance, increase national commitment to commodity security and building sustainable capacity were done. However IPLS is premature, the system helps to ensure better linkages between all functions, levels and actors in the sc and a single information system for pharmaceutical management rather than multiple and vertical system to improve the consistency, timeliness and completeness of data collection. (SC4CCM, 2013)

A supply chain in health care is defined as the sequence of physical and technical recourses required to deliver a good service to patients with complete satisfaction in a cost optimized manner. The aim of sc in health care is to find the vulnerabilities of among departments and propose measures to reduce them. It also uses to achieve targeted health outcomes and increases investments in global health by identifying weak areas. If a sc is efficient it will result in improved processes, efficient utilization of recourses, satisfied employees, effective treatment

and happy patients. The stakeholders in health care sc are manufacturers, purchasers, distributors and providers. Among this, hospitals and pharmacies are categorized under providers. The objective of hospital is to deliver health care to patients. And for this it needs high quality drugs in the pharmacy. In pharmacy sc, it is necessary to get accurate data on consumption of drugs since it is impossible to know the exact demand. Mostly in hospital pharmacy the person that manages the sc is the store keeper (Arora and Gigras, 2018).

2.1.5. Organizational Performance

It refers to how well an organization achieves its market oriented goals as well as financial goals. But both financial and non financial criteria can be used to measure organizational performance. Currently non financial indicators like service quality, reputation, capacity, market orientation, market development and others are used for organizational performance measurement. Increased productivity, reduced inventory, cycle time and market share, profit are short and long term objective of SCM for all sc respectively (Kaplan & Norton, 1998).

Organizational performance is also being studied from the perspective of SCM organizational performance which includes increased sales, organization wide coordination and SC integration. Improved coordination with customers, suppliers and departments, higher sales, higher accuracy in costing are the important items in measuring OP (koh *et al*, 2007).

In research recently carried out by Bigdeli (Cited in 2013 shou) showed that a key measure for the health care SCM performance is patient satisfaction. There will be a patient satisfaction when there is efficient health care and this will result in a better hospital performance.

Cost and customer service were identified among the five characteristics of the SCM. (Langley *et* al, 203). According to the theory of transaction cost analysis (TCA), the study of inventory (drug) management calls for an organization to keep all costs to a minimal level. Organizational supply chain can reduce cost through vertical integration which in turn result in cost reduction in inventory management and increase the service level of both internal and external customers and horizontal integration which result economy of scale from aggregation of supply and/or demand. In addition to this organizational performance is also related with cost reduction of the medicine. Pharmacy is one of the departments that consume half of the hospital budget for buying medicines. So the hospital must ensure uninterrupted supply of the medicines with an affordable price for patients. And this results a better patient satisfaction (Dorothy *et* al, 2015).

For this main reason for this research cost reduction and customer satisfaction are used to measure the performance of the organization in relation to the supply chain management.

2.1.6. Supply chain management practice and organizational performance

The SCM in hospitals includes the internal and external chain. While hospital storage and patient are categorized under the internal supply chain, manufacturers and distributors are included under the external supply chain. And the process of SCM in general in the health care sectors is the physical product, information and financial flow. While the physical product flow helps the management of the drugs and services for the treatment of patient care, information and financial flow are for effective products mainly medicines flow and improved organizational performance. Supply chain innovation, SC efficiency, efficient data management, reduction in medical error and speedy processing of patient care found to be positively related to organizational performance (Lee, *et al* 2011).

Different researchers have found a positive relationship between the SCM practices and organizations. According to Kim, covusgil and calantone (2006) found how SCM practices could enhance cost of leadership, customer service and product differentiation. Koh, et al (2007) also found the positive impact of SCM practice on small and medium enterprise performance. Also Khang, Arumu gam, Chong and Chan (2010) found the impact of SCM practice like leadership, IT adaptation, customer orientation and training on OP. Li et al (2005) found in their research the positive impact of SCM practice like quality management and supplier relationship management on organizational performance. And effective SCM practice results in improved organization market performance and financial performance (Callender, 2007).

From this analysis, many researchers identified different supply chain management practices

- Donlon:- outsourcing, cycle time compression, continuous process flow, IT sharing and strategic supplier partnership
- Tan et al (1998):- quality, purchasing and customer relationship management
- Alvardo and Kotzab (2001):- electronic data interchange and postponement strategy
- Li et al (2005):- information flow, postponement strategy, customer relationship management, strategic supplier partnership, internal operation practices and information quality

- Koh et al (2007):- outsourcing, cycle time compression, continuous process flow, IT sharing, customer partnership, JIT supply, few suppliers, holding safety stock and sub-contracting, e-procurement.
- Ellram et al (2007):- information flow, capacity and skill management, demand management, customer relationship management, supplier relationship management, service delivery management and cash flow
- Chong et al (2010):- information and technology management, information flow, customer relationship management, strategic supplier partnership, training and internal operation practices.

From the above analysis five SCM practices can be differentiated. These practices are information and technology management, customer relationship management, supplier relationship management, demand management and capacity and recourse management (Lang L.Y & Cheng L.T, 2012).

2.1.7. Challenges of health care supply chain management

Health care SC is very complex, fragmented, diverse and dynamic. The major challenges for the health care SCM is in achieving improved performance and service (Lenin, 2014). In an organization material management is the department that is responsible for the success of SC. And this material management in the health care includes the procurement, distribution and inventory control. According to Schneller and Smeltzer (2006) the second largest hospital expenditures material cost and supply cost and it account for 30% of the operating cost. The major problem of the tradition health care SC is each stage of SC operates independently.

Many researchers identified health care SC challenges at different area. Heinbuch (1995) tries to describe the health care cost reduction challenge through material management function. As Beier (1995) studies that there is a poor implementation of inventory management practice technique. Brennan (1998) also suggested that the use of integrated delivery network to achieve improved speed and quality of the service. Also it was identified that redesigning the inventory management process will result a good benefits for the hospitals.

With regard to the information technology (IT) - Schneller and Smeltzer suggested the e-procurement system for reducing purchasing costs. Burns (2002) suggested constantly evolving technology of products, high cost for physician's preference items and lack of IT infrastructure.

Additionally Mckone Sweet et al (2005) found that inappropriate application of SCM practices results in the lack of executive support, misaligned incentives and conflicting goals, limited education on SCM practices and lack of data collection and performance measurement (Callender,2007).

2.2. Empirical literature review

Certain previous researches have given a great attention to the relationship of supply chain management practice with organizational performance from different perspective of overall supply chain. Some of these research findings are discussed below.

A study conducted in Lesotho showed that hospitals that have standard operating procedures for drug supply chain management system were only 17% and 53% of the facility had stock record card which are bin and stock cards for medicines, medical supplies and equipment. All the facility does not have separate room for damaged and /or expired items which shows that there is poor storage management system of the facilities. The study also shows that there is poor management and supervision of the logistics management issues in the facilities. (Pharasi B, 2007)

According to the national survey conducted by PFSA in 2015, the availability of unfilled bin cards are high at hospitals (greater than 90%) and health centers was around 80%. This study showed that the accuracy of balances on bin cards by facility level showed at hospitals accurate balance range from 29% to 70% for different items. The study also showed that there is a variation in use of report and requisition form. (Paul *et* al, 2015)

According to the IPLS for health extension workers training midline evaluation report in 2012 showed that 95% of the health posts were resupplied primarily from health centers compared to only 66% of the health posts and at mid line only 13% of health posts also received products from woreda health office. The report also shows that at midline there was an increased trained staff in IPLS which was 70% at health post and 54% at health extension worker. (IPLS for HEWs, 2012)

According to a study conducted in Iran for drug supply chain management and implementation of health reform plan in teaching hospitals pharmacies showed that supply chain management system of medicines are near standards with the result of hospitals met standards for preparation

of medicines with 77%, for dimensions of drug storage with 74%, for taking medications with 74% and for drug distribution with 62%. (Jahanbani *et* al, 2016)

According to the study held in 2004, for the impact of SCM practice on competitive advantage and organizational performance data were collected from 196 organizations and the relationship proposed in the framework and the result indicates that higher levels of SCM practice can lead to enhanced competitive advantage and improved organizational performance. (Li *et* al, 2006)

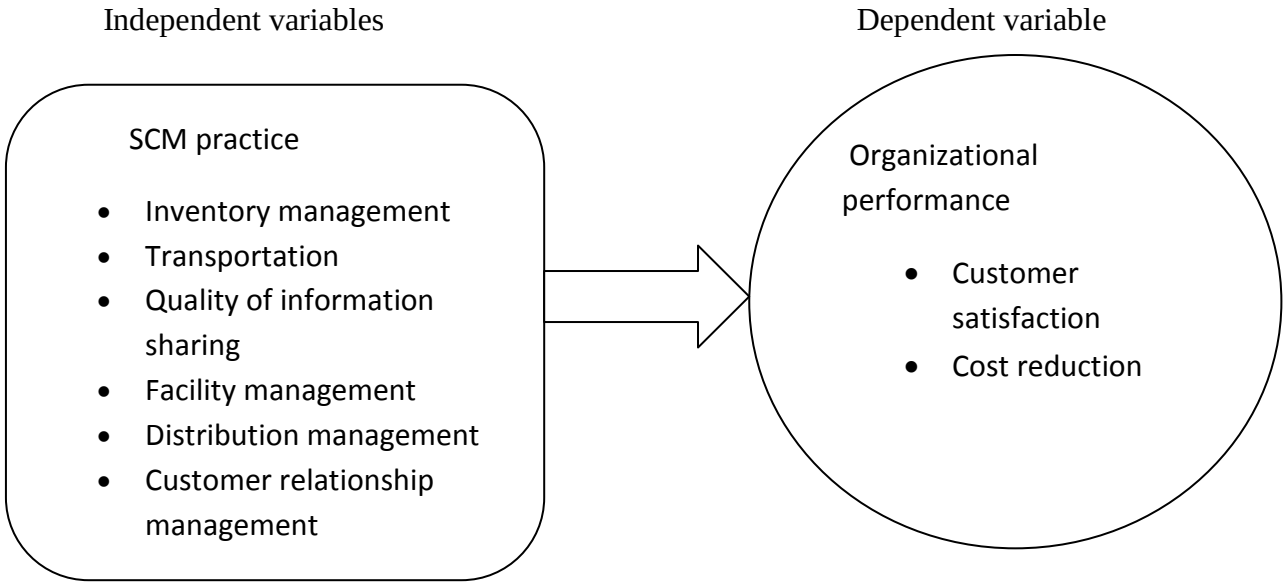
According to the study conducted in Jordan on supply chain management and its effect on health care service quality in private hospitals that there is a significant effect of supply chain management dimensions (relationship with suppliers, specification and standards, and delivery, after sales service) on the quality of health services. In addition the result also showed that there is no difference between supply chain management and the quality of health services due to gender, qualification, age or experience. (Raeeda Jamal Al-Saa'da *et* al, 2013)

According to the stud in 2017, the effect of supply chain management on performance in selected private hospitals in Nigeria showed that supply chain management has no strong and direct impact on hospital performance but has indirect impact on performance through competitive advantage. The study also concluded that an efficient supply chain management will result in more patient satisfaction and better competitive advantage. (Rotimi A. Gbadeyan ***et*** al, 2017)

According to Lang Ling Yap and Cheng Ling Lan in their study in the effect of service supply chain management practices on the public health care organizational performance found that a total of 5 dimensions of service supply chain management practices (information and technology management, demand management, customer relationship management, supplier relationship management, capacity and resource management) were determined to have a significant and positive direct relationship with organizational performance. In addition to this alliance network was found to have the mediating effect on the direct relationship. (Lang Ling Yap and Cheng Ling Lan, 2012)

2.3 Conceptual framework of the research

Fig 2.1. Conceptual framework



Source: - Wijetung W.A.D.S 2017, Dorothy oballah, Dr Esther waiganjo and Elizabeth wangu 2015

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. Study area and study period

The study was conducted in Amanuel mental specialized hospital located in Addis Ababa. It is governed by a board under the Federal Ministry of Health (FMOH). The hospital serves an average of 500 emergency and outpatient clients daily. The hospital has 600 beds with an annual patient attendant rate of 110,000 in 2016. It is a huge hospital in the country where a large amount of budget is utilized. The study was conducted from, Nov 5, 2018 to May 30, 2019 for 7 consecutive months.

3.2 Research approach

There are three types of approach in research, quantitative, qualitative and mixed and accordingly their selection depends upon how the researcher wants to do his /her study. Qualitative research is a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. Quantitative research is a means for testing objective theories by examining the relationship among variables (Creswell, 2009). In this study mixed method approach was employed because it allows more rich insights in to the research objectives. (Yin, 1994) In addition to this according to Creswell using both methods is advantageous because the overall strength of a study is greater than either qualitative or quantitative research. The quantitative approach answers questions related to the supply chain management practice and the qualitative part describe issues related to the supply chain management practice in relation to the organizational performance.

3.3 Research Design

The study was to assess the drug supply chain management practice and its influence on the performance of AMSH. So a descriptive research type was employed which helps to use both qualitative and quantitative data analysis.

An institutional based cross sectional study design was employed to assess the relationship between SCM practice and the hospital performance. Both of the variables (dependent and independent) were measured by using a single questionnaire.

In addition to this, an explanatory type of key formats interview was employed. This research focuses on the influence of drug supply chain management practice on the performance of the hospital.

3.4. Target population and sampling

All pharmacy professionals who are working in the stock management departments, higher officials were interviewed and all inventories documents which involved in the transactions were included in the study. The case institution has around 800 clinical and administrative employees. Out of this 70 employees who are working in the pharmacy were chosen for the study because the sampling method was a census sampling technique which is a complete enumeration of the population. In addition to these 7 higher officials was interviewed. In general 77 people were involved in the study.

3.5. Methods of data collection and research instrument

The method of data collection depends mainly upon the nature, purpose, and the scope of research which was conducted. Data was collected through primary and secondary sources that answered and fulfilled the objective of the study. A self-administered questionnaire with a 5 point likert scale (5- strongly agree to 1- strongly disagree) was employed that was adopted from other researchers (Gbadeyan *et al*, 2017 and Oballah *et al,* 2015) to collect information from pharmacy personnel and data abstraction format was used to collect necessary information from documents used in the transactions of inventories and data abstraction formats was developed from different literatures. In addition to these, key informant interview was done for higher officials of the hospital.

3.6. Data analysis

The data that was collected was analyzed and interpreted by using both qualitative and quantitative techniques. The raw data was coded and entered into epi info version 7.0 then transported to SPSS v-21 for the analysis. And mean, frequency, correlation analysis (Pearson) and regression analysis were done in order to check the factors which affect the drug supply chain system. The data collected by open ended questions were analyzed qualitatively.

3.7. Validity and Reliability test

3.7.1. Validity Test

To achieve validity questionnaires included a variety of questions on the knowledge of the respondents. To ensure content validity, the questionnaires were developed after rigorous review of related supply chain management literatures. The survey was tested by an advisor and pretest study was carried out on the pharmacy professionals who were working out of stock management department and didn't participate in the main study. All questionnaires were distributed to the subjects by trained data collector.

3.7.2. Reliability Test

Statistical investigations (Cronbach's alpha) were done in order to check the reliability of an instrument to capture intended objective of the study. The Cronbach's alpha value for all constructs SCM practice was greater than 0.7 that was considered to be acceptable. Summary of the reliability test of SCM practice and organizational performance is on the table below.

Table 3.1 Reliability Cronbach's alpha

Variables	Reliability Cronbach's alpha
Customer relationship management	0.808
Information management	0.730
Inventory management	0.714
Storage management	0.740
Distribution management	0.756
Transportation management	0.768
Organizational performance	0.865
SCM challenges	0.705

Source: own survey, 2019

3.8. Ethical consideration

A formal letter was obtained from Addis Ababa University, School of Commerce, Department of Logistic and Supply chain management. Ethical clearance was obtained from research and training Directorate of the hospital in order to do a research in the hospital.

During the study, respondents were informed about the purpose and the benefit of the study along with their full right to refuse or completely reject in participation. The respondents` was informed their response would be kept confidential and their identity shall not be exposed.

CHAPTER FOUR

4. DATA ANALYSIS, INTERPRETATION AND DISCUSSION

4.1. Introduction

As discussed in the other chapters, this research tries to assess the drug SCM practice and its influence on the performance of Amanuel Specialized Mental hospital. So the findings of the study are presented and discussed in this chapter. Data were collected using primary data and secondary data. And also there was a key informant interview of few staffs. The primary data was questionnaire which was developed in five scale ranging from five to one i.e., 1 is strongly disagree, 2 is disagree, 3 is not sure, 4 is agree and 5 is strongly disagree. A total of 69 questionnaires were distributed to the respondents and 64(92.76%) questionnaire were obtained valid and used for analysis. And the collected data were analyzed and discussed using SPSS Version 21 statistical software.

4.2 Respondent's profile

Table 4.1 analysis of educational level, position, work experience and age of the respondents

Educational qualification	Frequency	percentage
Diploma	6	9.4
Degree	53	82.8
Masters	5	7.8
Position		
Director	1	1.6
Dispenser	45	70.3
DSM	4	6.3
DIC	3	4.7
CPS	6	9.4
Store manager	5	7.8
Work experience(years)		

1.5	12	18.8
2.5	23	36
3.3	18	14.1
5	12	18.8
9.5	7	11
14	1	1.6
Age	28.78 (SD 4.33)	

Source: own survey, 2019

Out of 69 pharmacy professionals that were involved in the research, only 64 professionals respond for the questionnaire that was distributed. So the respondent rate was 92.76% which is an acceptable rate to do the analysis.

From the response rate 92.76%, most of them 39 (60.9%) are male and the rest 25 (39.1%) are female with the mean age of 28.78 (SD 4.33).

Educational level: - Most of the respondents 53(82.8%) have first degree, 6 respondents 69.1% have diploma and the rest which is 5 (7.8%) are professionals with second degree. From all the respondents 58 (90.6%) are professionals with first and second degree.

Position: - 1 respondent (1.6%) is directorate director of the pharmacy, 45 respondents (70.3%) are dispensers, 6 respondents (9.4%) are CPS providers, 4 respondents (6.3%) are DSM officer, 3 respondents (4.7%) are DIS providers and 5 respondents (7.8%) are store manager. From the position of the respondents, most of them 70.3% are dispensers that have a direct relationship with the final consumer which will tell us more about the customer satisfaction.

Work experience: - from the total respondents, 12(18.8%) respondents fall at a work experience of 1.5 years, 23 (36%) has a work experience of 2.5 years, 18 (14.1%) has a work experience of 3.3 years, 12 (18.8%) respondents have 5 years work experience, 7 (11%) has a work experience of 9.5 years and the remaining respondent has a work experience of 14 years. From this the majority of the respondents have a work experience of 2.5 years. This shows that most of the respondents have enough exposure for the hospital and knowledge about the subject matter under study.

4.3 Reliability test

Table 4.2 Reliability test of SCM practice

Cronbach's alpha	Cronbach's alpha based on standardized items	No of items
0.793	0.816	31

Source: own Survey, 2019

To assess the internal consistency of each factor obtained, a reliability test was conducted. The Cronbach's alpha coefficient for the 31 items is between 0.793 and 0.816, and this suggested that each item has relatively high internal consistency. A reliability coefficient of 0.70 and above is considered to be acceptable (Julie pallnt).

4.4 Response on supply chain management practice, challenges of SCM and Organizational performance

4.4.1. Response on Supply Chain Management Practice

31 questions were adopted to help gather information about the drug supply chain management practice. And these practices include customer relationship management, inventory management, facility management, distribution management, and quality information sharing and transportation management.

Table 4.3 analysis of the extent of SCM practice implementation

	N	Min	max	mean	Standard deviation
The staff members are technically competent in performing their task	64	1	5	3.89	.856
The service provided by the hospital are able to meet patient's expectation	64	1	5	3.42	.956
The hospital staff and patients have good interpersonal relations	64	1	5	3.69	.957
The hospital offers to the patients' good facility, comfort and clean environment	64	1	5	2.63	1.062
The hospital offers appropriate choice of treatment for the patient	64	1	5	3.45	.975
The hospital maintains a good level of trust with patients	64	1	5	2.63	1.062
The service which is provided for the patient has low risk of infections and other harmful side effects	64	1	5	3.13	1.062
The hospital service is effective and efficient	64	1	5	3.25	1.084
Information exchange between the store keeper or DSM officer & dispensers is timely	64	1	5	3.64	1.029
information between store keeper &/or DSM officer is accurate	64	1	5	3.69	.814
Information between store keeper &/or DSM officer is complete	64	1	5	3.67	.837
Information between store keeper &/or DSM is reliable	64	1	5	3.64	.784
Inventory management is visible for everyone	64	1	5	3.66	.895
All Inventors have a long shelf life	64	1	5	2.95	.983
Inventory management system is computerized	64	1	5	2.98	1.279

There is Loss &/or wastage of drugs because of inventory management problem	64	1	5	3.25	1.155
Purchase of medicines with near expiration date	64	1	5	3.14	1.067
the store is enough for all the medicines (up to date)	64	1	5	2.94	1.283
The location of the store is easily accessible for all the hospital staff	64	1	5	2.98	1.175
Capacity and flexibility of the store is enough	64	1	5	2.88	1.215
Vital and essential medicines are distributed to the dispensaries	64	1	5	3.75	.947
Medicines are distributed to the dispensaries easily	64	1	5	3.48	1.008
Medicines are distributed to the dispensaries timely	64	1	5	3.42	1.020
Medicines are transported from the suppliers in a timely manner	64	1	5	2.95	1.147
Only vital & essential medicines are transported from the supplier	64	1	5	2.72	.881

Source: Own Survey, 2019

The above table shows the five component of drug supply chain management practice of ASMH with their mean score and standard deviation.

From the customer relationship management, the competency of the staff members (pharmacist) in performing their task is found to be the leading practice with mean of 3.89 (SD .856). Following is the good interpersonal relation between the staff and patient with mean of 3.69 (SD .957). These two activities are greatly practiced in ASMH. The hospital offers appropriate choice of treatment for the patient with mean of 3.45 (SD 0.975), service provided by the hospital are to meet patient's expectation and the hospital maintains a good level of trust with patients with equal mean of 3.42 (SD .957 and .813 respectively), the hospital has efficient and effective service with mean score of 3.25 (SD 1.084) and the service which is provided for the patient has low risk of infection and other harmful side effects with mean score of 3.13 (SD 1.062). The hospital offering to the patients' good facility, comfort and clean environment is practiced moderately with mean score of 2.63 (SD 1.062). These findings show that the hospital has relatively good customer relationship management.

According to the respondents, the hospital has a great extent of timely information exchange between the store keeper &/or DSM officer with mean of 3.64 (SD 1.029), has accurate information exchange between the store keeper &/or DSM officer with mean 3.69 (SD .814), has complete information exchange between store keeper &/or DSM officer with mean 3.67 (SD .837) and has a reliable information exchange between the store keeper &/or DSM officer with mean 3.64 (SD .784).

The hospital has a visible inventory management system for every one with mean 3.66 (SD .895), there is a moderate loss &/or wastage of drugs because of inventory management problem with mean value of 3.25 (SD 1.155), the hospital purchases medicine with near expiry date with mean score of 3.14 (SD 1.067). According to the respondents ASMH has loss &/or wastage of drugs because of inventory management problem with mean of 3.25 (SD 1.155), it purchases medicine with near expiry date with mean of 3.14 (SD 1.067), the shelf life of the inventories is moderate with mean of 2.95 (SD .983), has moderately computerized inventory management system with mean of 2.98 (SD 1.279). But the hospital has a visible inventory management system for every one with mean of 3.66 (SD .895). In general the inventory management system is poorly practiced in ASMH.

The hospital has a moderate store for the medicine with mean 2.94, moderately accessible store for all the hospital staffs mean of 2.98 and has moderately enough capacity and flexibility with mean score of 2.88.

The hospital distribute greatly vital and essential medicine to the dispensary with mean 3.75, medicines are distributed to the dispensary easily and timely with mean of 3.48 and 3.42 respectively.

The hospital moderately transport medicines from the supplier timely with mean of 2.95 and moderately vital and essential medicines are transported from the suppliers with mean 2.72.

In general these findings indicate that the customer relationship management, distribution management and quality of information sharing are well practiced in the hospital and the others i.e. inventory management, facility management and transportation management are moderately practiced in the hospital. It needs to be improved.

4.4.2. Response on challenges of supply chain management

Table 4.4 analysis of the extent of Challenges of SCM

	N	Min	max	mean	Standard deviation
Poor infrastructure	64	1	5	3.69	1.125
Uncertainty in terms of demand	64	1	5	3.45	.958
Uncertainty in terms of supplies	64	1	5	3.72	.917
Lack of cold chain maintenance	64	1	5	3.23	1.020
Lack of training on supply chain management	64	1	5	3.72	1.105
Lack of qualified personnel	64	1	5	2.66	.996
Lack of porter	64	1	5	3.30	1.16
Payment delay to the suppliers	64	1	5	3.08	.860
Lack of cooperation between the store keeper and dispensers	64	1	5	2.42	.851
High cost of medicines	64	1	5	3.42	1.166

Source: Own Survey, 2019

The hospital has poor infrastructure with mean 3.69 (SD 1.125), there is uncertainty of demand and supply with mean of 3.45 (SD .958) and 3.72 (.917) respectively, the hospital lack cold chain with mean 3.23 (1.020), there no training on supply chain management with mean 3.72 (SD 1.105), has no porter with mean 3.30 (SD 1.16), there is payment delay to the supplier with mean 3.08 (SD .860) and the medicines are of high cost with mean score of 3.42 (1.166). But there is no lack of cooperation between the store keeper and dispenser with mean of 2.42 (SD .851) and there is no shortage of qualified personnel with mean 2.66 (SD .966).

4.4.3. Response on organizational performance

Table 4.5. Analysis of extent of organizational performance

	N	min	max	mean	Standard deviation
Inventory management practice contribute greatly to the performance of the hospital	64	1	5	4.05	.983
Inventory management practice helps in inventory planning and scheduling	64	1	5	4.03	.975
long procurement procedure affect inventory management and performance of the hospital	64	1	5	3.92	.981
Insufficient fund towards inventories contribute greatly to the poor performance of the hospital	64	1	5	3.67	1.113
Inadequate trained staff in the inventory management section at Amanuel hospital contribute the poor performance of the hospital	64	1	5	3.61	1.121
Improved customer service can be realized with proper inventory management in the hospital	64	1	5	4.06	.990

Source: Own Survey, 2019

Based on the findings on the table above the performance of the hospital has a mean score of greater than 3.5. This implies that almost all of the respondents agreed to the fact that inventory management practice greatly contribute to the performance of the hospital.

4.5. Correlation analysis

Correlation analysis between components of SCM practice and organizational performance

This section presents the correlation analysis between the independent variable and dependent variable. Correlation analysis is used to describe the strength and direction of the linear relationship between the two variables. There are two types of co relation analysis i.e. Pearson product moment correlation coefficient and spearman rank order correlation. A correlation coefficient has a value ranging from -1 to 1. Values with a coefficient of +1 indicate that the two variables are perfectly positively related so as one variable increases the other also increases by a

proportionate amount. On the other hand a coefficient of -1 indicates a perfectly negative relationship as one variable increases the other decreases and a coefficient of +1 indicates a perfectly positive relationship as one variable increases the other also increases. A coefficient of 0 indicates there is no linear relationship. The rest values which is between -1 and +1 shows a relationship according to the table below.

Table 4.6. Correlation Coefficient

Strength of association	Coefficient r	
	positive	negative
Small	0.1 to 0.3	-0.1 to -0.3
Medium	0.3 to 0.5	-0.3 to -0.5
Large	0.5 to 1	-0.5 to -1

Source: Andy Field, 2006

For this research Pearson correlation test is used because it has a normal distribution otherwise spearman correlation test would be used.

4.5.1. Correlation analysis between constructs of SCM practice and Organizational performance

Table 4.7. Correlation analysis between constructs of SCM practice and OP

		Op	distribution	Facility	inventory	transport	info	Crm
Op	Pearson Correlation	1	.219	.206	.306*	.156	.162	.279
	Sig. (2-tailed)		.082	.103	.014	.218	.201	.026
	N	64	64	64	64	64	64	64
*. Correlation is significant at the 0.05 level (2-tailed).								
**. Correlation is significant at the 0.01 level (2-tailed).								

Source: Own Survey, 2019

The results of the correlation matrix between each constructs and organizational performance analyzed as follows.

As shown in the above table there is a positive correlation coefficient between customer relationship management and organizational performance with a coefficient value of 0.279 and a significant value of 0.026. This indicates that there is a small positive correlation between these two variables that is significant at the level of 5% significance level. There is also a positive correlation coefficient value of 0.306 between inventory management and organizational performance with significance value of 0.014. And this indicates that there is a medium positive relationship between these two variables which is significant at the 5% significance level.

The other three supply chain management practices that are information management, distribution management, transportation management and facility management have no significant correlation with organizational performance.

This means at 95% confidence level ($p<0.05$), the highest correlation is signified by inventory management ($r=0.306$) followed by customer relationship management ($r=0.279$).

4.5.2. Correlation between SCM and organizational performance

A Pearson correlation test was conducted between SCM and the results are shown in the table below.

Table 4.8. Correlation analysis between SCM and OP

		Op	scm
op	Pearson Correlation	1	.255*
	Sig. (2-tailed)		.042
	N	64	64
scm	Pearson Correlation	.255*	1
	Sig. (2-tailed)	.042	
	N	64	64

Source: Own Survey, 2019

As shown in the above table there is a positive correlation coefficient between supply chain management and organizational performance with coefficient value of 0.255 and significance value of 0.042. These shows that there is a small positive correlation between them that is significant at the 5% significance level.

4.5.3. Correlation analysis between SCM challenges and OP

Table 4.9. Correlation between SCM challenges and OP

		op	challenge1
Op	Pearson Correlation	1	-.163
	Sig. (2-tailed)		.197
	N	64	64
challenge1	Pearson Correlation	-.163	1
	Sig. (2-tailed)	.197	
	N	64	64

Source: Own Survey, 2019

From the above table the correlation coefficient between supply chain management challenge and organizational performance has a value of -0.163 and significance value of 0.197. This shows that there is a small relationship between them and as the supply chain management challenge increases, the organizational performance decreases and the vice versa is also true but the correlation is not significant at 5% significant level.

4.6. Regression analysis

Table 4.10. Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.134[a]	.18	.002	.46433	.018	.101	1	62	.0292

a. Predictors: (Constant), scm

b. Dependent Variable: op

Source: Own Survey, 2019

From the above table the coefficient of determination was found to be 0.18 that indicates the supply chain management accounts for 18% only. This suggests that 82% of the variation is not explained by supply chain management practice.

ANOVA[a]

Table 4.11 Anova

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.244	1	.244	1.130	.0292[b]
	Residual	13.367	62	.216		
	Total	13.611	63			

a. Dependent Variable: op

b. Predictors: (Constant), scm

Source: Own Survey, 2019

The above table indicates that the significant level is 0.0292 which is less than 0.05. This shows that the model was statistically significant at the 5% level of significance.

4.6.1. Multicollinearity test of the independent variable

Table 4.12. Multicollinearity of independent variable

Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
CRM	.882	1.134
Info	.862	1.160
transport	.719	1.391
inventory	.787	1.271
Facility	.819	1.221
distribution	.766	1.306

Source: Own Survey, 2019

The above table shows that the collinearity between independent variables has no Multicollinearity problem since the value of tolerance is greater than 0.1 and the value of variance inflation factor (VIF) is less than 2.5.

4.7. Annual pharmaceutical expenditures of AMSH

Amanuel Mental Specialized Hospital had total recurrent annual budgets (in Birr): 25,031,723.75 in Fiscal year 2010/11 (2003 E.C) and 193,532,815.68 in fiscal year 2017/2018 which showed increment in successive years as shown in table 1.

Table 4.13**:** Annual budget allocations of ASMH from 2010/11(2003 E.C) -2017/2018(2010 E.C)

Fiscal year	***Approved budget (in birr)***	***Utilized budget (in birr)***
2010/11(2003E.C)	25,031,723.75	23,074,932.28
2011/12(2004 E.C)	28,207,9321.01	25,740,964.11
2012/13(2005 E.C)	29,905,100	29,350,105.07
2013/14(2006 E.C)	37,582,008.50	36,368,527.68
2014/15(2007 E.C)	45,219,847.49	44,635,252.43
2015/16(2008E.C)	66,929,771.63	64,758,095.44
2016/17(2009E.C)	149,909,000	122,742,867.86
2017/18(2010 E.C)	193,532,815.68	182,820,838.75

Source: Getachew Asfaw, 2018 unpublished paper.

A proportion of pharmaceutical expenditure with hospital budget utilization is asymmetric from year to year from 2010/11 (2003 E.C) to 2017/2018 (2010 E.C) as shown in table 2.

From the above table the approved budget for the hospital is increasing for every consequent year. And also the utilized budget by the hospital is also increasing every year. This shows that the hospital is using its allocated budget properly and its performance is increasing every year.

Table 4.14: Annual Pharmaceutical Expenditure of ASMH from 2010/11(2003 E.C) - 2017/18(2010 E.C)

Fiscal years	Hospital utilization (in birr)	Pharmaceutical utilization (in birr)	Pharmaceutical utilization versus hospital budget utilization
2010/2011 (2003 E.C.)	23,074,932.28	3,307,984.74	14.3
2011/12(2004 E.C)	25,740,964.11	7,941,055.98	30.8
2012/13(2005 E.C)	29,350,105.07	9,462,340.90	32.2
2013/14(2006 E.C)	36,368,527.68	8,854,858.80	24.3
2014/2015(2007 E.C)	44,635,252.43	7,320,497.48	16.4
2015/16(2008E.C)	64,758,095.44	14,046,614.41	21.7
2016/17(2009E.C)	122,742,867.86	25,963,558.19	21.1
2017/2018(2010 E.C)	182,820,838.75	39,999,223.10	21.8

Source: Getachew Asfaw, 2018 unpublished paper.

4.8. Qualitative Findings

In-depth interviews were held with a chief executive officer, clinical director, Finance head, pharmacy head, drug supply manager and store managers of the hospitals. From 7 key informants interviewed (chief executive officer, finance director, pharmacy director, clinical coordinator, drug supply manager and two store persons) 6 of them were males. Majority of them were in the age group of 27 to 39 years with a master's degree. Their work experience ranged from 5 to 11 years.

As per the key informants, all of the participants agreed that supply chain management have an effect on organizational performance. Some of the points rose how poor SCM could affect organizational performance were:

- Decrease patient satisfaction
- Decrease patient trust on the service provided
- Unavailability of vital and essential medicines

- Make the hospital unable to meet the standard of the services rendered.
- Make the hospital ineffectively and inefficiently utilization of the resource
- Make the hospital ineffectively and inefficiently utilization of the allocated budget

As per the key informants, the major problems affecting the Supply chain system of the hospitals were:

- The use of both a manual and electronic pharmaceutical record system which includes bin and stock cards. However, the bin cards were not updated strictly.
- High work load by store keepers.
- Absence of bin cards in dispensaries of the hospital.
- Max-Min inventory control management was not properly practiced in the hospital.
- There was no specific time to order, quantity to order or how much stock to hold.
- Inadequacy of storage space.
- Limited capacity of PFSA to supply the requested quantity in the required time.
- Shortage of staff and lack of commitment and initiation by the staffs.
- Vital and essentials medicines frequently stock-out.

As one of the key informant response hospital performance is measured not only by the drug supply chain management practice in the hospital but also by other factors that are mentioned in the Ethiopian Hospital Reform Implementation Guidelines (EHRIG) which contains 7 chapters (hospital leadership and governance, patient flow, medical record management, pharmacy service, laboratory service, nursing care standards and infection prevention). Based on the results that are found from these units, they can set the hospital performance as poor, medium or great by giving percentage of the cumulative department that are found in the hospital. The pharmacy service is one point from the above point and the drug supply chain management has a great influence on the pharmacy performance more than the hospital performance. But this doesn't mean that it won't affect the hospital performance. Since almost one fourth of the hospital budget is held for the procurement of medicine, medical supplies and medical equipment, it has to utilize its allocated budget to avail the necessary vital and essential medicine throughout the year for the customer in return increases the pharmacy service which directly has relation with the organizational performance.

4.9. DISCUSSION

This study assessed the influence of SCM practice (customer relationship management, inventory management, facility management, information management, distribution management and transportation management) on the organizational performance in the case of AMSH. A mixed type of quantitative and qualitative data collection method was used in addition to document reviewed. Questionnaire were developed and distributed to the employees of AMSH pharmacy professional staffs. Then according to the respondents and the questions asked, result of the descriptive analysis implies that the hospital implements customer relationship management, information management and distribution management among the SCM practice in a good way. Two of the practice i.e. facility management and transportation management are implemented in a moderate way. And the last one, inventory management, is practicing poorly. And there is a very visible supply chain management challenges in the hospital. But almost all respondents agreed that inventory management practice is very important for the hospital performance.

The correlation analysis result shows that there is a positive correlation between CRM and inventory management with organizational performance which was significant at the 5% significance level. But there was a small positive relationship between the other constructs of SCM with OP which was insignificant either in the 5% or 1% significance level. The SCM challenge is negatively correlated with OP which was insignificant at the 5% significance level.

The inferential analysis also shows that there is a positive relationship between SCM and OP with significance value of 0.0292. But it only accounts for 18% which the rest, 82%, was explained by other factors. The study that was done by Aboneh, 2017 on a similar type of organization also found a positive correlation between some of the constructs of SCM and OP which was significant. It also matches with Dorothy *et al,* 2015 with the result of a positive relationship of inventory management with the organizational performance.

CHAPTER FIVE

5. SUMMARY OF MAJOR FINDINGS, CONCLUSION, RECOMMENDATION AND SUGGESTIONS

5.1. SUMMARY

- The demographic characteristics show that the majority of the respondents are male (60.9%) and the mean age of the respondents is 28.78. all of the respondents including the key informants are well educated having degree and diploma. In addition the results of the study reveal that the respondents have a work experience of less than five years and majority of the respondents are dispensers that have a direct contact with the last consumer.
- From the descriptive analysis result, CRM has a mean of 3.26, information management has a mean of 3.66, inventory management has a mean of 3.19, facility management has a mean of 2.93, distribution management has a mean of 3.55 and transportation management has a mean of 2.84. From this information management and distribution management followed by CRM and inventory management is practiced well in the hospital. And facility management and transportation management are practiced moderately. Although the respondents rate highly of their CRM, secondary document show that there is almost no available concrete evidence found that show the hospital measure and analyze their customer satisfaction level.
- From the correlation analysis result there was significant positive correlation between the two variables which are CRM and inventory management with OP that is significant at the 5% significance level. But the other four independent variables (facility management, information management, distribution management and transportation management) have no significant correlation with OP.
- From the regression analysis result, the SCM practice has a positive and significant relationship with organizational performance. But the supply chain management only accounts for 18% only which the rest is explained by hospital leadership and governance, patient flow, medical record management, pharmacy service, laboratory service, nursing care standards and infection prevention.

- The standard deviation result shows a higher value indicating the higher variation in the respondent's responses.
- Poor infrastructure, limited capacity of PFSA, lack of training on SCM, shortage of staff, high cost of medicines and outdated service by the store keepers are the major mentioned SCM challenges of the hospital.

5.2. CONCLUSION

The study tried to describe the drug supply chain management practice and its influence on the performance of the hospital in the case of ASMH.

The results obtained in this study contribute to the hospital to focus on the component of the SCM practice which are CRM and inventory management to build up their OP since they were found to be significant and have influence on OP.

The best SCM practices should be benchmarked from other hospitals that have reached at a higher stage to respond to customer satisfaction and cost reduction and these findings were mentioned in the qualitative study part as a factor which could affects organization performance of the hospital. The hospital should also be aware, understand the SCM practice and its purpose because the main challenge of this hospital is lack of understanding the SCM implementation. Generally the values of the results of this study are a better understanding of the existing SCM practice and challenges in the case hospital.

Finally further study is necessary to give a strong conclusion regarding the influence of the SCM on organizational performance by controlling the different limitation of this study.

5.3. RECOMMENDATION

Based on the findings of the study and conclusions drawn from them, the following recommendations and suggestions are made for the hospital to take actions.

- The hospital should improve their CRM to a higher level by evaluating their customer satisfaction in a timely basis and giving on the job training to increase the ability and commitment of the pharmacy professionals.
- The hospital should further increase their inventory management by using up-to-date technologies, by applying maximum minimum inventory control system and by giving training and supportive materials to assist the staff in forecasting and procurement of vital and essential medicines.
- The hospital should give short term, long term trainings and available materials on SCM implementation to equip the DSM officer and store managers by the knowledge of different concepts of SCM practice.
- The hospital should work closely with stakeholders like PFSA in order to get vital and essential medicines in an affordable price. And also the hospital should arrange procurement method from other private suppliers if vital and essential medicines are stock out from PFSA.
- Finally all the stakeholders should work together equally for a better implementation of SCM practice to gain a customer satisfaction and cost reduction.

5.4. SUGGESTION

- Further study should be done by increasing the number of independent variables to get a more strong result.
- Further research should be done to a large sample to integrate a greater number of statistical analysis techniques, to improve the reliability and validity of the instrument and to generate a more significant finding.

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Appendix

This questionnaire is designed for the purpose of collecting data on the drug supply chain management practice and influence on the performance of Amanuel specialized mental hospital. I kindly ask you to fill this questionnaire by putting '√' sign in the appropriate cell.

Section A: Demographic profile

1. Gender Male ☐ Female ☐
2. Age …….
3. Educational level…….
4. How many years you have worked for the organization? ……
5. Your position in the organization……..

Section B

Supply chain management practice according to the hospital

	Strongly disagree	Dis-agreed	Not sure	Agree	Strongly agree
Customer relationship management					
The staff members are technically competent in performing their task and facilities provided by the hospital are able to meet patient's expectations					
The hospital staff and patients have good interpersonal relations					
The hospital offers to the patients' good facility, comfort and clean environment					
The hospital offers their patients appropriate choice of treatment					
The hospital maintains a good level of trust with patients and risk of infections and other harmful side effects are minimal					
The hospital service is effective and efficient					
Quality of information sharing					
Information exchange between the store keeper or DSM					

officer & dispensers is timely					
information between store keeper &/or DSM officer is accurate					
Information between store keeper &/or DSM officer is complete					
Information between store keeper &/or DSM is reliable					
Inventory management					
Inventory management is visible for everyone					
All Inventors have a long shelf life					
Inventory management system is computerized					
There is Loss &/or wastage of drugs because of inventory management problem					
Purchase of medicines with near expiration date					
Facility management					
the store is enough for all the medicines (up to date)					
The location of the store is easily accessible for all the hospital staff					
Capacity and flexibility of the store is enough					
Distribution management					
Appropriate medicines are distributed to the dispensaries					
Medicines are distributed to the dispensaries easily					
Medicines are distributed to the dispensaries timely					
Transportation management					
Medicines are transported from the suppliers in a timely manner					
Only Important medicines are transported from the supplier					

Section C: Regarding the challenges of supply chain management

	Strongly disagree	disagree	Not sure	agree	Strongly agree
Poor infrastructure					
Uncertainty in terms of demand					
Uncertainty in terms of supplies					
Lack of cold chain maintenance					
Lack of training on supply chain management					
Lack of qualified personnel					
Lack of porter					
Payment delay to the suppliers					
Lack of cooperation between the store keeper and dispensers					
High cost of medicines					

Section D: Organizational performance

1. The last year (2010 E.C) allocated budget for pharmaceutical purchase? .....
2. The last year (2010 E.C) utilized budget for pharmaceutical purchase? ……

Effect of inventory management on organization performance

	Strongly dissatisfied	Dis satisfied	Not sure	Satis fied	Strongly satisfied
Inventory management practice contribute greatly to the performance of the hospital					
Inventory management practice helps in inventory planning and scheduling					
long procurement procedure affect inventory management and performance of the hospital					
Insufficient fund towards inventories contribute greatly to the poor performance of the hospital					
Inadequate trained staff in the inventory management section at Amanuel hospital contribute the poor performance of the hospital					
Improved customer service can be realized with proper inventory management in the hospital					

Section E: Key in format interview

1 Do you think that medicine supply chain can affect the hospital performance? Yes or No
2 If yes, in what way it affects hospital performance
3 If no, why it doesn't affect the hospital performance?
4 How do you explain hospital performance?
5 What are the challenges of medicine supply chain of the hospital?
6 What do you think that improve hospital medicine supply chain?

THANK YOU