



**ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS**

**THE EFFECT OF LOGISTICS MANAGEMENT PRACTICES ON
ORGANIZATIONAL PERFORMANCE: A Case of ETHIOPIAN
PHARMACEUTICALS SUPPLY AGENCY**

**A Thesis Submitted to College of Business and Economics at
Addis Ababa University in Partial Fulfillment of the Requirement
for the Degree of Master of Business Administration**

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COLLEGE OF BUSINESS AND ECONOMICS
POST GRADUATE PROGRAM OF BUSINESS
ADMINISTRATION

This is to certify that this research titled as “The Effect of Logistics Management Practices on Organizational Performance in the case of Ethiopian Pharmaceuticals Supply Agency”. It is submitted to College of Business and Economics at Addis Ababa University in partial fulfillment of the requirement for the degree of Master of Business Administration in Management. The thesis written by Biruk Tafese is an authentic study carried out by his own effort under our guidance.

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I, the undersigned, declare that this study titled as “The Effect of Logistics Management Practices on Organizational Performance in the case of Ethiopian Pharmaceuticals Supply Agency” is the outcome of my own in-depth research. This study has not been submitted for a degree in any other university. It is submitted to College of Business and Economics at Addis Ababa University in partial Fulfillment of the Requirement for the degree of Master of Business Administration. All sources of materials used for the Research have been duly acknowledged, cited and referenced.

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LETTER OF CERTIFICATION

This is to certify that Biruk Tafese has carried out his study under my supervision on the topic of The Effect of Logistics Management Practices on Organizational Performance in the case of Ethiopian Pharmaceuticals Supply Agency. This work is original in its nature and is acceptable for Submission in partial fulfillment of the requirement for the award of MBA Degree in Management.

Prof. Ayele Trife Woldemichael (DR-ING) _____

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Date_____

DEDICATION

This work is dedicated to my God and members of the family who gave me strength to meet challenges at every stage of my life. This work is also dedicated to all people across the globe who passed away due to the pandemic corona virus (COVID-19).

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List of Acronyms

AIDS-Acquired Immune Disease Syndrome

ARV-Anti-retro Viral

ATO-Assemble-to-Order

COVID-19 - Coronavirus Disease-19

DC-Distribution center

EDI-Electronic Data Interchange

EFDR- Federal Democratic Republic of Ethiopia

ERP-Enterprise Resource Planning

EPSA-Ethiopian Pharmaceuticals Supply Agency

HSTP-Health Sector Transformation Plan

IPLS-Integrated Pharmaceuticals Logistics System

LIS-Logistics Information System

MOH-Ministry of Health

MTO-Make-to-Order

MTP-Make to plan

PAT-Principal-Agent Theory

RBV-Resource Based View

ROI-Return on Investment

SDP-Service Delivery Point i.e. facilities (Hospitals, Health center and health Posts)

SFD-Sourcing and Facilities Division

SPSS-Statistical Package for Social Sciences

TCA/E-Transaction Cost Analysis/Economics

TPL-Third Party Logistics

USAID-United State Aid for International Development

Abstract

Logistics as a business function plays important role in company's performance through the planning, implementation and control processes linked to material, information and financial flows. The main objective of this study was to examine the effect of logistics management practices on organization performance in the case of Ethiopian Pharmaceuticals Supply Agency. These included the managements of practices in customer service, warehouse and inventory, transportation, information flow and supply. During conducting this study the researcher applied Descriptive and explanatory research designs as well as quantitative research approach. The population of the study consisted of employees of the Ethiopian Pharmaceuticals Supply Agency working in operation processes. The operational areas included forecasting and market shaping, warehouse and inventory management, procurement (contract and tender management), distribution and fleet management, capacity building and operational research, laboratory quality control and Fund administration (Project/program and Revolving drug fund) from which the sample was drawn. The appropriate sample has been drawn through applying stratified random sampling. The primary and secondary data sources were used for this research. A self-administered questionnaire was designed to collect relevant information from the selected 148 respondents. Among this 140 questionnaires were returned and analyzed using Statistical Package of Social Science (SPSS) version 24. The percentage, mean and standard deviation of descriptive analysis were employed. The inferential analysis including Pearson correlation and multiple linear regressions were also employed. The study indicated that logistics management practices in Ethiopian Pharmaceuticals Supply Agency were frequently practiced. The study showed that logistics management practice contributed in the form of financial and market measures to the Ethiopian Pharmaceuticals Supply Agency organizational performance to a large extent. The investigation also brought out that there was significant and positive effect of logistics management practices on organizational performance in the Agency. The study further revealed that practices of customer service, warehouse and inventory management, transport management, information flow management and supply management have predicting power on organizational performance of the Ethiopian Pharmaceuticals Supply Agency. Moreover, the study revealed that the Ethiopian Pharmaceuticals Supply Agency faced logistics management challenges to a great extent. Some of the challenges were shortage of foreign currency, lack of collecting receivables, inaccuracy quantification and increasing logistics cost. The study recommended to enhance the logistics management practices and to deal with concerned government bodies to alleviate and overcome shortage of foreign currency, make effective collection of receivables and balance level of logistics service and cost.

Key words: *Logistics management practices (practices in customer service, warehouse and inventory management, transport management, information flow management and supply management) and organizational performance*

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

In today's world of diverse economic conditions and the ever changing micro and macro-economic variables of various organizations, logistics plays a key role in supporting organizations that strive for more efficient management systems and enhance their performance. Numerous researchers and scholars suggest that the ability to transport goods quickly, safely, economically and reliably is seen as vital to the success of businesses and to a nation's prosperity and capacity to compete in globalized economy. According to Haji Esmael et al., (2016), logistics is a vital element to improve both profitability and competitive performance of a firm. Not only this but also Muslimin et al., (2015) also states that logistics plays an important role in facilitating the flow of goods in and out of the company.

According to Stevenson (2009), logistics described as the part of a supply chain involved in forward and reverse movement of products, services, cash and information. Included also are the management of all transportation, material handling, warehouse and inventory, order processing and distribution, third-party logistics and reverse logistics in logistics activities (Stevenson, 2009). All the supply management processes which impact on logistics and customer satisfaction. The customer satisfaction leveraging on order processing, inventory management, transportation, handling, packaging and facility network design have greatly impacted by logistics (Chiarini, 2015).

Lloyd, et al., 2008) revealed that despite initiatives taken to increase access and the availability of anti-retro viral (ARV) in East African countries through the Global Fund to Fight AIDS, the medical supply management in the region's countries was found to be deficient. This was attributed to inadequate capacity to quantify needs, place orders and adequately keep records. Poor inventory management can be inferred from inaccurate stock records, inadequate and unsystematic monitoring of medical stock, stock out, inadequate storage space and condition and unclear procedures in terms of frequency of order and quantity. These incidents can be traced to inadequate know-how of inventory management and its actual management (Management science for health, 2012).

Logistical system is made up of logistics services, information systems and infrastructure. A logistics service is made up of activities such as warehousing and transportation that support the movement of materials and products from the point of origin to consumption, and vice versa.

The efficient management of key and supporting logistical processes helps reduce costs related to goods flowing through the supply chain system and those in the production and physical distribution as well as storage, inventories and transportation. On the other hand, the capacity for putting a product in a place and where a demand exists call for satisfying the clients' requirements before its competitors can do (Alarcon & Antun, 2013).

The emergent prominence of logistics arose from firms becoming globalized to increase access to new markets, realize superior manufacture efficiencies and tap technological competencies beyond their own geographical borders (Kilasi et al., 2013). According to Shang and Marlow, (2007), customer focused logistics strategy stresses on tailored logistics services to create maximum customer satisfaction, increase larger market share, enhance performance and accomplish business excellence.

1.2 Statement of the Problem

Nowadays, firms are encountered with growing competitive pressure, unpredictable market changes and dynamically varying regulations (Roth et al., 2013). In a global world of business, organizations look towards some of the many options available in the form of opportunities and strategies to deal with the challenges that will deny them the chance of being market leaders. According to Mundia et al. (2015), organizations are adopting various strategies to ensure that they remain competitive in the market. Enhancing logistical service capabilities will help reduce internal costs and improve competitiveness in the market and around the world (Boonpattarakon, 2012). Firms adopt different strategies to enhance their performance. According to Bagshaw (2017), logistics management can be one of those strategies decisive for companies to acquire superior performance.

According to management science for health (2012), in many countries, poor inventory management in public health institutions results in wastage of financial resources, poor availability of some essential medicines and stock outs. Stock shortages and stock outs of pharmaceuticals are among noticeable features of a poorly performing pharmaceutical logistic management practices. These problems significantly compromise the quality of

healthcare service delivery to patients (Management science for health, 2012).

Lack of effective pharmaceutical logistics management system affects not only the availability of essential drugs but also efficiency. The losses of 70% of the original expenditure were due to deficiencies in selection, quantification, storage, high prices, poor quality, theft and expiration of drugs, irrational prescribing and inappropriate use of medicines by patients (Management science for health, 2011).

As firms find themselves under growing pressure from both clients and stockholders to seek methods in which to reduce their costs while at the same time enhancing performance, they are forced to determine ways in which they may improve the efficiency and effectiveness of their practices. These forces are increasingly influencing the way in which firms and their customers view logistics practices.

According to the assessment report of the EFDR Ministry of Health (August, 2015), the sector's capacity in procuring and distributing pharmaceuticals, medical supplies, laboratory reagents and equipment through various programs has increased significantly in order to improving the uninterrupted availability of health commodities at affordable prices and in a sustainable manner. Enabling the health facilities to quantify/forecast their pharmaceuticals demand numerous capacity building activities have been undertaken. Though this is enabling the Ethiopian Pharmaceuticals Supply Agency to base its procurement on health facilities demand, there are still problems in record-keeping, quantified/forecasted data quality, timely requisition and consumption reporting.

The proper logistics management practices will impact on several aspects in the company, including production schedules, distribution effectiveness, customer satisfaction and firm performance. Specially, in pharmaceutical suppliers, the provision of complete health care necessitates the availability of safe, effective and affordable drugs and related supplies of the required quality. These are not achievable without efficient practices of the logistics activities. Pharmaceuticals denote a great percentage of the costs in the healthcare system. They account for 20–60% of spending on health in developing and transitional countries (Cameron A, et al., 2009).

To have a superior performance, firms must focus on the effective and efficient management of the logistics practices or activities. Firms will need to look towards such ideas of managing their logistics operations and practices because doing this will lead to cost reductions,

optimization of resource use and even improved quality service delivery. Logistics thus plays an important role in company's performance. Realizing the importance of logistics management is critical for competitive advantage because operational performance has a positive impact on companies' financial performance (Tilokavichai et al., 2012). Nowadays, the role of the "logistics function" in ensuring the smooth flow of materials, products and information throughout a firm's supply chains is a key element of business performance (Kilasi et al., 2013).

In the case of Ethiopian Pharmaceuticals Supply Agency, although it has the objective of being customer centric, offering the best quality of products, meeting world-class standards and building a financially sound agency, logistics has not been considered as a key source to meet the objective. As a result, the role of logistics has not received the attention it deserved in terms of considerable influence that it can contribute to meet the agency's objective. Even if Ethiopian Pharmaceuticals Supply Agency is a monopoly public agency and does not encounter stiff market competition, Government expects the Agency to avail a full range of affordable pharmaceutical products to the public at large and the same time curb recurrent delays and quality problems. This requires the Agency to be efficient and effective in its operation. For this, logistics can play an important role in its performance.

Studies related to pharmaceutical logistics management practices in Ethiopia in general are very limited. There have not been studies conducted on the effect of logistics management practices on organizational performance in the Agency. The study, therefore, will enhance the attention given to logistics and its role. This gap will be addressed by the following research questions in terms of logistics management practices. This involves practices in customer service, warehouse and inventory management, transportation management, information flow management and supply management. Furthermore, it is expected that this research work will offer useful guidance for measuring and implementing logistics management practices in the Agency. This also provides empirical evidence of the impact of logistics management practices on the Agency's competitive advantage and its performance.

1.3 Research Questions

The researcher bears in mind that the following research questions enhance the idea to conduct the study and get appropriate findings.

1. What is the state of logistics management practices of Ethiopian Pharmaceuticals Supply Agency?
2. What is the relationship between logistics management practices and organizational performance that exist in Ethiopian Pharmaceuticals Supply Agency?
3. What is the effect of logistics management practices on organizational performance of Ethiopian Pharmaceuticals Supply Agency?
4. What are the challenges of logistics management practices in the Ethiopian Pharmaceuticals Supply Agency?

1.4 Objectives of the Study

1.4.1 General Objective

- The General objective of the study is to examine the effect of logistics management practices on organizational performance of Ethiopian Pharmaceuticals Supply Agency.

1.4.2 Specific Objectives

- i. To determine the status of logistics management practices in Ethiopian Pharmaceuticals Supply Agency.
- ii. To establish the relationship between logistics management practices and organizational performance in Ethiopian Pharmaceuticals Supply Agency.
- iii. To examine the effect of logistics management practices on organizational performance of Ethiopian Pharmaceuticals Supply Agency.
- iv. To determine the challenges of logistics management practices in Ethiopian Pharmaceuticals Supply Agency.

1.5 Scope of the Study

This study focuses on the effect of logistics management practices on organizational performance in Ethiopian Pharmaceuticals Supply Agency. The dimension of the study is also limited to the logistics management practices of customer service, warehouse and inventory management, transportation management, information flow management and supply management. Regarding organization performance, the study is delimited to financial,

availability and marketing measures.

1.6 Significance of the Study

The significance of the research can be seen from different standpoints. First, the study will have significance for Ethiopian Pharmaceuticals Supply Agency to realize the connection between logistics management practice and organizational performance which in turn will help the agency to put emphasis on its logistics management practice to enhance its organizational performance. Second, it is imperative for managers and leaders within the pharmaceuticals industry to recognize and acknowledge that the logistics management practices can positively and negatively affect the organizational performance and how their employees approach their logistics related practices. It intends to help the managers and leaders of the organization to identify the challenges that hinder the performance of the agency and to learn how to mitigate those problems. Third, it will give insight for people who wish to replicate the findings of the study on related areas. The finding and recommendation from this study provide means of designing appropriate strategies and directives that can support to address the deficiency of logistics management practices to improve organizational performance level.

1.7 Limitations of the Study

A longer time and enough resources would have helped to unearth more findings especially with Ethiopian Pharmaceuticals Supply Agency's branch offices located in different regions of the country to determine the relationship noted above. Despite the fact that, the researcher has recognized the need to cover all employees of Ethiopian Pharmaceuticals Supply Agency Head Office and its 19 branches, resource limitation, time constraints and unmanageable population size forced the study to focus on the Head Office of Ethiopian Pharmaceuticals Supply Agency. Accordingly, the respondents from whom the data has been collected was also limited to the employees who are working in logistics management operation processes of Ethiopian Pharmaceuticals Supply Agency Head Office.

During data collection there were problems related to corona virus (COVID-19) pandemic, Consequently, practicing social distancing, putting face mask on our mouth and nose, avoiding meetings, and staying at home are some of dos and don'ts regulation given by the Federal Government of Ethiopia to prevent the plague. Thus, a few respondents were not willing to fill and give responses.

1.8 Structure of the Research Outcome

This section provides a brief highlight of the structure of the study and it was organized in five parts.

Chapter One- Introduction: This chapter provides an overview to readers to understand what the research is all about. Hence, it is the introductory chapter which highlighted the background of the study: statement of the problems which occurred in the current context that prompted this study; objectives of the study to be achieved, significance of this research, scope and limitation of the study and definitions of key terms included the study.

Chapter Two- Literature review: Chapter two consists of a comprehensive review of information from secondary sources of data were available on the topics of interest. This includes concepts and theories of logistics and supply chain management, logistics management practices, organizational performance and other related issues. The secondary data refers to other researchers' publications such as books, thesis, academic articles and journals from online databases. Information that is related to the research topic was studied and used as a reference to formulate the conceptual framework, the research questions and finally the objectives. The empirical study of other researchers also demonstrated the relationship between related variables, which was used to develop the research hypotheses.

Chapter Three- Research Methodology: The third chapter discusses the methodology applied to conduct the research included here are research approach and design, sampling technique, sample size determination, methods of data collection, source and types of data and data analysis.

Chapter Four: This part provides analysis, interpretation of data, presentation and findings of the study. The discussion includes some statements by other researchers to support the results.

Chapter Five: Finally, the fifth chapter presents the summary of findings, conclusions and recommendations plus suggestions for future research.

1.9 Definition of key terms

Agency: Ethiopian Pharmaceuticals Supply Agency.

Inventory management practices: The process of having the optimal quantity of row

materials for transformation and finished products available to meet customers' inventory requirements.

Information flow: is the flow of data processed in different directions with variable contents between various data base (department) with in a company.

Logistic information system: refers to the computer based information system (IS) that supports all aspects of logistics management.

Transport management: refers to the efficient and effective management of activities involved in shipping of goods or finished products from suppliers to a facility or to warehouses and sales locations.

Service delivery points: The health facilities namely Hospitals, health centers, health posts, pharmacies and drug stores.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2. Introduction

This section of the study contains both theoretical and empirical literature. Thus, this chapter presents history and advancement of logistics, overview of logistics and its definitions, concepts of logistics management practices and their effect on organizational performance, logistics management challenges and logistics and supply chain theories. Moreover, empirical review of the study related to the effect of logistics management practices on organizational performance which is expected to give comprehensive knowledge concerning the subject matter are discussed. Further, conceptual framework and hypotheses of the study were also presented.

2.1 History and Advancement of Logistics, Supply Chain Management and Logistics Management Practices

These subtitles are a summary presentation of the different scholarly work. The subtitles explains the history and advancement of logistics, definition and role of logistics in business, difference and interchangeable usage of supply chain and logistics managements, organizational performance, logistical management practices and challenges and key logistics processes.

2.1.1 History and Advancement of Logistics

Both logistics and supply chain management are not new ideas. From the construction of the pyramids to the relief of hunger in Africa, the principles supporting the effective flow of materials and information to meet the necessities of customers have changed little (Christopher, 2011). In 1898 logistics was discussed as, “a Strategy or art of handling troops in the theatre of war and tactics that of handling them on the battle field (Galindo, 2016). Initially Logistics was a military activity concerned with attaining soldiers and arms to the battle front (Kumar and Shirisha, 2014). The term, logistics was initially developed in the framework of military activities in the late 18th and early 19th centuries and launched from the military logistics of World War II (Tseng, 2004). Logistics had to do with procurement, maintenance and transportation of military facilities, materials and personnel (Ronald, 2007). Currently it is seen as an essential part in company’s production process to carry raw-materials. This raw-material is taken to the next operation, not to market goods and finished

goods to market and customer (Kumar and Shirisha, 2014).

The possible root of the term is the Greek *logistikos*, meaning ‘skilled in calculating’. Military definitions usually integrate the supply, movement and quartering of troops in a set. Today, a number of researches have been approved to relocate logistics applications from military to corporate activities (Tseng, 2004). During the Second World War, many considerable developments happened in areas such as science, technology, strategies and supply chain management. After the war, continued development has been attained in the region of logistics (Chang, 1998).

Before the 1960s business logistics was not an academic subject. An essential component of logistics, namely the trade-off between transport and inventory costs was officially recognized in economics at least as early as the mid-1880s. According to American experience the growth of logistics could be divided into four periods (Kumar and Shirisha, 2014). Logistics historical development before the 1950s exhibited that it was under dormant states. Production was the principal function of the managers and logistics in business was once viewed as a “necessary evil” during this period. During the 1950s to and 1960s, applying new ideas of management in company was a propensity. During this period the military was the only organization using the term logistics. In mid of 1960s organizations began to look at the principles of military logistics as a means of improving distribution network. Many researches and applications of logistics appeared from the 1970s onwards. Due to rise in petroleum price in 1973, the effects of logistics activities on enterprises grew. The significance of logistics system on planning and business of the time has been increased due to slow growth of market, pressure of high stagflation, relating of transportation control and competition of the third world on goods and materials. In the early 21st century the new thoughts of logistics are logistics alliance, Third Party Logistics (TPL) and globalized logistics. Logistics flow is a significant part of business activities in sustaining competitiveness; however, to conduct and manage a big organization is cost consuming and not economical. Consequently, alliance of international businesses could save operation costs and cooperation with third party logistics (TPL) could specialize in logistics area (Kumar and Shirisha, 2014).

Parallel to the outcomes in the prominence of distribution, logistics and the supply chain have been the outcomes in the number of related names and different definitions that are used. Some of the different names that have been applied to distribution and logistics encompassed

physical distribution, logistics, business logistics, materials management, procurement and supply, product flow, marketing logistics, supply chain management, demand chain management and more (Rushton, 2010). It has been only in the recent past that business organizations have come to identify the vigorous impact that logistics management could have in the accomplishment of competitive advantage. The six phases of logistics developments are workplace logistics, facility logistics, corporate logistics, supply chain logistics and global logistics (Halldorsson Arni et al., 2007). They are discussed below.

i. Workplace Logistics

Workplace logistics is the movement of material at a single workstation. Restructuring the movements of an individual working at a machine or along assembly line is the critical objective of workplace logistics.

ii. Facility Logistics

Facility logistics is the movement of materials between workstations within the four ramparts of a facility (that is, inter-workstation and intra-facility). The facility could be a factory, terminal, a warehouse or a distribution center. Facility logistics has been more usually referred to as material handling. The roots of facility logistics or material handling are in the mass production and assembly lines that prevailed in the 1950s and 1960s. Today, the term material handling has fallen out of favour because of its associations with non-value adding activities. In the 1960s material handling, warehousing and traffic were grouped together to make use as physical distribution; procurement, marketing and customer service were collected together to become business logistics.

iii. Corporate Logistics

As management structure progressive with information systems, the ability to integrate and synthesize departmental functions (material handling, warehousing and others) into activity areas like physical distribution and business logistics in the 1970s permitted the first application of right logistics within a company. Corporate logistics became a process within the common objective developing and maintaining a profitable customer service policy while controlling and reducing total logistical costs. Corporate logistics is the flow of material and information between the facilities and processes of a corporation, namely inter-work stations in the facility and intra-corporate. Corporate logistics is some times associated with the phrase physical distribution that was popular in the 1970s.

iv. Supply Chain Logistics

Supply chain logistics is the movement of resources, information and money within firms (inter-workstation, inter-facility, inter- corporate and intrachain). There is a lot of misperception surrounding the terms logistics and supply chain management. The supply chain is the network of services (warehouses, factories, terminals, docks, stores, and homes), vehicles (trucks, trains, planes and ocean vessels) and logistics information systems (LIS) linked by an enterprise's suppliers and its customers. Logistics is what happens in the supply chain. Logistics activities (customer response, warehouse and inventory management, supply and transportation) connect and activate the objects in the supply chain process. It is unfortunate that the phrase supply chain management has been so readily and commonly accepted to the flow of material, information and money in logistics network. Actually, there are some links in the chain.

v. Global Logistics

Global logistics is the movement of supplies, information and currency among countries. Global logistics flows have increased dramatically during the last several years due to globalization of the world economy, expanding use of trading blocs and global access to websites for buying and selling merchandise. Global logistics is much more complex than domestic logistics due to the multiplicity of hand offs, players, languages, documents, currencies, time zones and cultures that are inherent in international business.

vi. Next-Generation Logistics

There are many theories regarding the next phase of logistics development. Various logisticians believe that collaborative logistics, logistics models built with constant and actual optimization plus communication among all supply chain partners will be the next phase of evolution (Halldorsson Arni et al., 2007).

2.1.2 Definition and Role of Logistics in Business

There was no true concept of logistics in private industry as stated before. Instead, departmental silos comprising material handling, warehousing, machining, accounting, marketing and others were usual (Halldorsson Arni et al., 2007). Nowadays, the word logistics means, in a comprehensive sense, the process of managing and controlling the flows of materials, energy, information and other resources as facilities, services and people. It includes the incorporation of information, transportation, inventory, warehousing, material handling, security and packaging (Galindo, 2016). Logistics is the management of the flow of

goods, information, service and other resources between the point of origin and the point of consumption in order to meet the requirements of consumers (Sakchutchawan et.al, 2011).

The process of quantification/forecasting, implementing and controlling the efficient and effective flow and storage of materials involved through logistics. The movement of materials, services and associated information from point of origin to the destination is the process of logistics for the purpose of conforming to customer requirements. It includes the management of raw materials flow to finished goods through a company (Ristovska et al., 2017). Logistics is strategically significant in many businesses as it is crucial to achieving competitive advantage (Kenyon and Meixell, 2007). This definition covers inbound, outbound, internal and external movements. Logistics comprises the management of order processing, inventory, transportation and the combination of warehousing, materials handling and packaging, all assimilated throughout a network of amenities (Bowersox et al., 2002). Its overall objective is to support procurement, manufacturing, and market distribution operational requirements, and to contribute to maximum current and future profitability through the cost effective fulfillment of customer orders (Tilanus, 1997). Within an organization the challenge is to establish functional competency into a combined operation concentrated on servicing consumers (Bowersox et al., 2002).

2.1.3 Logistics and Supply Chain Management

The term ‘supply chain management’ is now frequently used. The general logistics notion advocates the benefits of viewing numerous components of logistics as an integrated whole. Supply chain management is similar. The supplier and the end user in the process or the upstream (supply side) and downstream (demand side) partners in the system are also included in the supply chain management. This is the main difference between supply chain management and traditional logistics. Though some of these elements have also been recognized as key to the successful planning of logistics operations, there are four distinct differences claimed by supply chain management over the more classic view of logistics (Alan Rushton, Phil Croucher and Peter Baker, 2014). These four are the following:

- The supply chain is viewed as a single entity rather than a series of fragmented elements such as procurement, manufacturing and distribution. This is also how logistics is observed in most forward looking businesses. The actual change is that both the suppliers and the end users are encompassed in the planning procedure, thus going outside the boundaries of a single company in an attempt to design for the supply chain as a whole.

- Supply chain management is very much a strategic planning process, with a particular emphasis on strategic decision making rather than on the operational systems.
- Supply chain management provides for a very different approach to dealing with inventory. Traditionally, inventory has been used as a safety device between the distinct components within the pipeline leading to bulky and expensive stocks of products. Supply chain management targets to change this perspective so that inventory is used as a last option to balance the integrated flow of product through the channel.

The use of integrated information systems is an essential activity to the success of effective supply chain management. This integrated information system is part of the whole supply chain rather than merely acting in isolation for each of the separate components. These enable visibility of goods demand and stock levels through the entire length of the pipeline. This has only become an option with the current advances in information systems technology (Alan Rushton, Phil Croucher and Peter Baker, 2014).

2.2 Logistics Management

Logistics management activities typically include inbound and outbound. These comprised transportation and fleet management, warehousing and inventory management, materials handling, order fulfillment, logistics network and supply/demand planning. To varying degrees, the logistics activities also include sourcing and procurement, manufacture planning and scheduling, wrapping and assembly and customer service. Logistics management integrates logistics operations with other activities including marketing, sales, production, finance and information technology (CSCMP, 2010). It is treated as a part of the supply chain management that deals with management of products in an efficient way. The objective of the logistics management is to provide the right product in the right quality at the right time in the right place at the right price with the information to the ultimate consumer (Ristovska et al., 2017).

2.3 Logistics Management Practices

Logistics practices can be divided into key and support activities (Ballou, 2007) as cited in (Serdaris et al., 2014). Key Activities are central to the operation of every organization. These activities involve transportation, inventory management, customer service, information flows and order management. Support practices include warehousing, materials handling, purchasing, packaging, production/operation management and maintenance of information

systems. Customer service, inventory management, transportation, storage and materials management, packaging, information processing, demand predicting, production planning, purchasing and facility site are the crucial elements of the logistics system. Other activities could include tasks such as after-sales parts and service support, maintenance activities, return goods handling and reprocessing action (Reddy and Jayam, 2016).

The point is that every organization, be it manufacturer or service provider, for-profit or non-profit, has customers that it needs to reach. By integrating the suitable functions into a customer-centric logistics system, the firm can established a sustainable advantage that is very problematic to be imitated by a competitor (Reddy and Jayam, 2016).

2.3.1 Customer Service Practices

According to Rushton (2010), customer service is inextricably linked to the practice of distribution and logistics. Within this process there are many impacts that may be pertinent to customer service. These range from the ease of ordering to stock obtainability to delivery consistency. There is the need to balance the level of service delivered with the cost of that provision (Rushton, 2010). The crucial worth of logistics is to accommodate client requirements in a cost-effective way. In basic customer service programs, the focus is characteristically on the operational aspects of logistics and ensuring that the organization is accomplished of the seven rights to its customer: the right amount/quantity of the right product/goods at the right time at the right place in the right condition at the right price/cost with the right information (Bowersox et al., 2002). According to Bowersox et al., (2002), for a logistician a customer is any delivery location. Usual destinations range from consumers' homes to retail and wholesale trades to the receiving ports of manufacturing plants and delivery centers. In some cases, the customer is a different company or individual who is taking possession of the product or service being delivered. In many other conditions the customer is a different facility of a similar firm or a business partner at some other site in the supply chain (Bowersox et al., 2002).

According to Christopher (2011), the consistent provision of time and place utility referred to as customer service. Customer service is also defined as Products don't have value until goods are in the hands of the consumer at the time and place demanded. There are clearly several features of customer service ranging from on-time provision to after-sales support. Basically the role of customer service should be to enhance 'value-in-use' meaning that the

product becomes worth more in the eyes of the customer because service has added value to the core product (Christopher, 2011).

Customer services in logistics comprise product availability, lead time to acquire the product, states of the product when received and correctness of filling an order (Reddy and Jayam, 2016). Selling a product is sometimes easier than physically getting it to customers in today's global marketplace. Organizations must agree on the best method to store, handle and move their products and services, so that they are available to customers in the right varieties, at the right time and in the right place. Corporeal distribution and logistics effectiveness will have a considerable impact on both customer satisfaction and organization costs. A poor distribution system can destroy an otherwise good marketing exertion (Kotler et al., 2005).

2.3.2 Warehouse and Inventory Management Practices

Warehousing is an essential part of all logistics system. Warehousing is part of a firm's logistics system that stores products namely raw materials, parts, goods in process, finished goods at and between point of source and point of destination of items being stored (Meng, 2006). The word distribution center (DC) is occasionally used, but the terms are not same. Warehouse is the more generic term. A warehouse management system is a critical component of an effective overall supply chain management and plays a critical role in assuring high levels of customer service and overall logistics performance. Warehouse management involves determining on the site of the warehouse with the lowermost cost that will deliver easy access to its clients and suppliers (Goksoy, 2013).

One of the main challenges in handling a supply chain is that demand can alter quickly. The firms can be responding quickly when demand changes through their warehouses (Bartholdi and Hackman, 2014). A storage activity is required production and consumption cycles match rarely. The storage function overcomes variances in desired quantities and timing (Kotler et al., 2005).

Efficient and effective warehouse management and great productivity rates depict the company as an entity that values the customers because if the company is running on wasteful warehouse and suffering from destitute productivity levels, it could be sending wrong message to its clients. Inefficient warehouse management can lead to shipping delays, processing mistakes and extra problem that could negatively influence on the rate of customer satisfaction (Bagshaw, 2017). Warehousing delivers time and place utility for any

good through well-organized management of space and time (Ackerman, 1997). Fronting the challenge of providing customers with an increasing variety of products and reducing holding time of resources and parts, the concentration of warehousing has shifted from inert storage towards strategically located warehouses providing timely and economical inventory replenishment for customers (Faber, 2015).

According to Tsige (2013), the five functional areas of warehouse include receiving, staging for cross-docking, reserve, forwarding and shipping. The major specific warehouse activities are receiving, relocate and put away, order picking, cross-docking and shipping. The most significant component of warehousing is order processing which commonly refers to the workflow combined with supplying products ordered by a client. The primary objective of most warehouses is to smooth the flow of products from suppliers through the supply chain to the end customer while meeting the customers' demand in a timely and cost-effective manner (Sayeed, 2013).

The receiving activity comprises unloading of individual products from the dealers or clients, bring up-to-date inventory record and examination to check whether there are any quantity and quality differences. Transfer and put away comprise the transfer of incoming goods to storing areas. The main activity of most warehouses is order picking. This is the procedure of obtaining the right products in the right quantity from the right storage sites in answering to specific customer requirements. Cross-docking activity is when the received goods are directly moved to shipping region. In the cross-docking operation, products might also have a short stay on the staging area with and without order picking activity. Finally, shipping is carried out to move the picked order items to the next destination. The standby area (also known as overstock region) is for bulky products that will stay in the warehouse for extended period of time. Moreover, the major activities of a warehouse are to stock products in order to make a variety for clients, to assemble customer orders, establish transport to the clients and ship orders timely in the way required by the client. Some of the significant roles of warehouse are to make or break bulk (Tsige, 2013). Consolidation centers, cross docking centers, transshipment, product fulfillment centers, returned goods depots, some other roles like customer support, installation and repair services (Sayeed, 2013).

According to Tsige (2013), four material flows are possible in a warehouse. The first flow is the cross-docking activity, in which products are either stored in a staging area for a while or directly moved to shipping area. A product stored in the reserve area comparatively for longer

period and order picking activities are done is the second flow of material in the warehouse. The third flow is when products are first stored in standby area and then transferred to the onward area. In the last type of flow received products are directly transferred into onward region so that the respective order amalgamation can be carried out (Tsige, 2013).

Inventory is the stock of any item or material used in a company. The set of procedures and establishes that monitors levels of inventory and controls what levels should be kept, when stock should be replenished and precisely how large orders should be is done by an inventory system (Augustine and Agu, 2013). According to Babatunde & Arogundade (2008), inventories are the soul of any manufacturing organization. They refer to the stock of items used within the production system such as basic raw materials, supplies of components or work-in-progress and finished goods. Appropriate coordination of manufacture activities based on the predictable demand, obtainable inventory profile, and lead-time, given capacity and other associated variables is of highest prominence (Bagshaw, 2017).

The main aim of inventory management is to ensure that organization hold inventories at lowest cost possible while at the same time achieving the objective of ensuring that the company has acceptable and continuous supplies to upsurge continuity of processes (Mpwanya, 2005). Inventory management is mainly involved with stipulating the size and location of stocked products. The scope of inventory management also involves managing the replenishment lead time, replenishment of goods, returns and defective goods, carrying costs of inventory and asset management. Physical inventory, available physical places, demands predicting, inventory assessment, inventory visibility, upcoming inventory price forecasting and quality management are included in the inventory management (Agu Okoro Ag et al., 2016).

Organizations are intense in managing their inventory system so as to decrease costs, enhance the quality of service, improve product availability and eventually confirm customer satisfaction (Thogori and Gathenya, 2014). Maintaining the subtle balance between carrying too much and too little inventory is the main problem. Excessive inventory carrying costs and stock obsolescence are the results of carrying too much inventory. On the other hand, carrying too little stock leads to risks not having products when clients want to buy (Kotler et al., 2005).

Inventory management is a thoughtful management issue for most organizations—large organizations, medium-sized organizations and small organizations. Effective inventory flow management in supply chains is one of the important determinants for achievement. Balancing the supply of inventory with demand is one of the challenges in handling inventory. Ideally, the firm does not want to have too much inventory staying on hand because of the cost of carrying inventory. On the other hand, an organization would want to have sufficient inventories to fulfill the demands of its clients which means no lost sales due to inventory stock-outs. Therefore, in managing inventory, organizations must balance the costs of carrying great inventories against resulting sales and profits (Agu Okoro Ag et al., 2016).

According to Augustine and Agu (2013), inventory is classified into three types which include Raw material inventory (all items purchased by an organization for processing), work-In-Progress Inventory (an intermediate stage of raw material inventory that is yet to be finished by the plant to enter another stage of processing. These are materials that have been partly processed but are yet incomplete) and finished Goods Inventory (stock of goods awaiting shipment or in the warehouse).

The basic objective of inventory management is the conservation of an optimum level of inventory required to support the manufacture system at any time and at the minimum cost possible. The achievement of this objective requires taking decisions with respect to the resolution of a proper order quantity, when to place the order and how much inventory to carry per unit of time. The strategies available to a company in meeting its inventory management objectives are a reflection part of inventory ordering systems. Primarily, there are three principal inventory ordering systems. These are the fixed–order quantity system, the fixed-order interval system and the ABC inventory analysis system (Augustine and Agu, 2013).

- a. The Fixed-Order Quantity System: Orders for a fixed quantity of items are placed for each inventory cycle. The time of ordering may fluctuate but the quantity ordered per period is constantly similar. This system is occasionally stated to as the (Q, R) system. Once inventory level becomes as low as point R (reorder point), an order is located for Q units of inventory.

- b. The Fixed-Order Interval System: This examines the status of inventory level at specific periods and tries to bring the inventory level to a desired point if the inventory level has gone under the minimum desirable point in-between the time of the periodic appraisals.
- c. The ABC Inventory Analysis: Effective control of inventories can be costly, time and effort consuming. Experience has shown, however, that not all items kept in inventory require such meticulous, close-study and intensive care particularly if such items are low-value items that are randomly used in the production system. There are some items, however, whose quantities are small but whose monetary values are exorbitant. They normally account for between 10-20 percent of total items kept in inventory, while they account for as high as between 70-80 percent of the total monetary value of investment in inventory. These items commonly labeled as belonging to the A group. This group of items are called “significant few” inventory items. There are also those items that account for between 30-40 percent of the total items of inventory and at the same time, take as much as 15-20 percent of the monetary value of total investment in inventory. Determination of effective management this group of items is categorized into group B. The last group of inventory items found in group C. These are the items that usually account for the least value of the total monetary investment in inventory but greater in number. This class of items is known as the “insignificant many” (Augustine and Agu, 2013).

2.3.3 Transportation Management Practices

Transport is a set of practices related to the movement of people, material and products by suitable means. It plays a very important role in logistics, because of the goods movement and the creation of supplementary services (Grabara et al., 2014). The most significant economic activity among the elements of company logistics systems is transport system. It provides the physical link through the movement and storage of materials for production, and outbound logistic through the movement and storage of finished goods to the customer (Sabry, 2015).

Transportation is a main practice in the logistics chain which is involved at each phase right from the production of the good to its final delivery at the required site. By moving products from sites where they are sourced to locations where they are demanded, transportation provides the important service of linking an organization to its suppliers and consumers (Reddy and Jayam, 2016). An indispensable and a main sub-function of logistics that creates

time and place utility in products is transportation. In fact, the backbone of the whole supply chain is the transportation management that makes it possible to attain the eminent seven Rs. These are the right product in the right quantity and the right condition, at the right place, at the right time, for the right client at the right cost (Kumar and Shirisha, 2014). A connective role among the numerous steps that result in the transformation of resources into useful goods played by the transportation is crucial. The concept of business logistics constitutes the arrangement of all these functions and sub-functions into a system of products movement in order to minimize cost and maximize service to the customers (Tseng et al., 2005). Transportation mode, fleet size, route selection, and vehicle scheduling and freight consolidation are the dealing of transport management. All these four areas are economically interrelated and should be planned in an assimilated manner to attain maximum benefit (Reddy and Jayam, 2016).

In shipping goods to its warehouse, dealers and customers, the company chooses among five transportation modes namely road, rail, water, pipeline and air (Kotler et al., 2005).

- i. Road* - Trucks are highly flexible in their routing and time schedules. They are well-organized for short hauls of high-value products. Also, there is increasingly greater freedom for international haulers to transport goods between destinations within one country, resulting in greater efficiency in the use of trucks.
- ii. Rail* - Railroads are one of the most cost-effective modes for shipping large amounts of bulk products namely coal, sand, minerals, farm and forest products over long distances
- iii. Water* - In countries favorably served by coastal and inland waterways, a large amount of goods can be moved by ships and barges. Water transportation is the slowest mode and is affected by the weather however, its cost is very low for shipping bulky, low-value, non-perishable products such as sand, coal, grain, oil and metallic ores.
- iv. Pipeline* - Pipelines are a specialized means of shipping raw commodities such as petroleum, natural gas and chemicals from sources to markets. Most pipelines are used by their possessors to ship their own resources.
- v. Air* - Although the use of air carriers tends to be limited to low-bulk goods, cargos freights are becoming more important as a transportation mode. Although, the rail or truck rates are smaller than air-freight rates, air freight is ideal when speed is desired or distant markets have to be reached. The perishable products (fresh fish and cut flowers), high-value and low-bulk items (technical instruments and jewelry) are the most frequently air-freighted

goods. Air freight is advantageous as it reduces inventory levels, packaging costs and the number of warehouses needed.

In choosing a transportation mode for a product, shippers must balance many considerations like speed, dependability, availability, cost, capability and others. Air and truck are the prime choices when the shipper wants speed. If the aim is low cost, then water or pipeline might be premium. In practice, companies may depend on a combination of transportation means which would best able them to meet logistics objectives lucratively (Kotler et al., 2005).

2.3.4 Information Flow Management Practices

According to Bowersox et al. (2002), within logistical system information flow identifies specific locations. Information also assimilates the three working areas. Different movement requirements exist with respect to urgency of flow within specific logistics area, size of order and availability of inventory. Reconciling these differentials to enhance overall supply chain performance is the main objective of information flow management practice. It is necessary to concern that information requirements parallel the actual work performed in market delivery, business support and procurement. The effort involved in the logistical system can be wasted without maintaining accurate information.

According to Azevedo et al. (2007), while the logistical system converts materials into products through the creation of value for customers, the information and communication systems change records and statistics into information in order to ease managerial decision making. Information is decisive to enhance logistical effectiveness, efficiency and flexibility. For its turn, these determinants provide the possibility of companies becoming more competitive. The flow of information in a smoothly and quickly manner provides managers with comprehensive knowledge could be led to effective logistics management in the organization (Azevedo et al., 2007). Investing on and applying computers, internet and information communication systems can be viewed in virtually all undertakings in the logistics business. These activities of logistics are transportation, warehousing, order processing, materials management and procurement. It can help businesses to accomplish competitive advantages by providing consumers with superior services (Adebambo and Toyin, 2011).

From a logistics perspective, information flow involving customer orders, billing and inventory levels. Customer data are also closely linked to network performance. Information

can be shared and managed in many ways: by mail or telephone, through salespeople, via the Internet, or through electronic data interchange (EDI) and the computerized exchange of data between organizations (Kotler et al., 2005).

2.3.5 Supply Management Practices

Procurement is the process that a manufacturer, a wholesaler or a retailer buys materials, services and supplies from external suppliers to support its operation (Meng, 2006). Procurement is defined as acquisition of products, services and information to ensure the operational effectiveness of the company's production and marketing processes (Pienaar, 2010). Purchasing and supply are known as procurement. These are amongst the crucial links in the supply chain. These could have a significant impact on the overall success of the firm. Ensuring that there are adequate supplies of raw materials at the right price, of the required quality, in the right place and at the right time is clearly central to any manufacturing plant (Rushton, 2010).

The emergent focus on procurement as a key capability in firms has inspired a new perspective concerning its role in supply chain management. Ensuring supply, minimization of inventory, improvement of quality, supplier development and lowest overall cost of ownership are particularly and considerably focus of supply management (Bowersox et al., 2002). The procurement function includes selecting resources and suppliers, determining the form in which the inputs are to be acquired, timing and coordinating the arrival of incoming goods, price negotiation and quality control of incoming goods (Pienaar, 2010).

The efficient and effective coordination of industrial strategy with the procurement of materials and components eventually relies on logistics is the interface of logistics with procurement and manufacturing. In manufacturing operations resource inputs must be obtained and made available when needed. Whether the manufacturing strategy is Make-to-Order (MTO), Assemble-to-Order (ATO) or Make to plan (MTP), logistics links the supplier base with manufacturing processes. Clearly, the more seamless the interface, the better the opportunity is for achieving lowest cost of ownership and then ultimately lowest total cost of manufacturing. These operations are only emerging when there is high-level supplier integration in both processes and in design. The three approaches to achieving desired coordination are Just-in-time, Materials Requirements Planning and Designing (Bowersox et

al., 2002).

2.4 Organizational Performance

Even though its concept is very common in the theoretical literature, organizational performance is difficult to define because of its several meanings. For this reason, there is no a universally accepted definition of this concept (Gavrea et al., 2011). The definition of organizational performance and its dimension continues to challenge researchers due to its intricacy (Santos and Brito, 2012). According to According to Neely et al. (2005), performance measurement is a topic which is often discussed but rarely defined. In its literally meaning organizational performance is the process of quantifying action. The process of quantification and action leads to performance is referred to as measurement. According to the marketing perspective, organizations achieve their objectives that are they perform by satisfying their customers with greater efficiency and effectiveness than their competitors. The terminologies of efficiency and effectiveness are used precisely in this context. The degree to which customer requirements are met is referred to as effectiveness. On the other hand, efficiency is a measure of how economically an organization's resources are utilized when providing a given level of customer satisfaction. Organizational performance involves three particular areas of organization results:

- a. Financial performance (profits, return on assets, return on investment and others)
- b. Product market performance (sales, market share, availability and others)
- c. Shareholder return (total shareholder return, economic value added and others) (Richard et al., 2009).

Performance has been regarded in a great diversity of ways by logistics scholars. The definition and measurement of performance is often a challenge for researchers because organizations have multiple and frequently conflicting objectives. Consequently, the meaning of the performance is 'eventually up to the evaluator' (Shang and Marlow, 2007).

Measurement refers to a firm's performance measurement system which can be defined as the process of quantifying the efficiency and effectiveness of action leading to performance. A tremendous measurement system should produce three main benefits. These are reduced costs, improved service and the generation of healthy growth (Shang, 2004).

The level of performance a company achieves is a function of the efficiency and effectiveness of the activities it undertakes (Neely et al., 2005) and thus:

- Performance measurement can be defined as the process of quantifying the efficiency and the effectiveness action.
- A performance measure can be defined as a metric used to quantify the efficiency and/or effectiveness of an action.
- A performance measurement system can be defined as the set of metrics used to quantify both the efficiency and effectiveness of actions.

Organizational performance is difficult measure and there is no universally accepted definition. However, organizational performance refers to how well an organization achieves its market-oriented objectives as well as its financial goals. This definition covers both financial performance and operational performance. Several prior studies have measured organizational performance using both financial and market criteria. These criteria include the growth of market share, the growth of sales, profit margin on sales, return on investment (ROI), the growth of ROI and overall competitive position (Wijetunge, 2016). Marketing performance reflects the firm's competence to increase sales and expand market share as compared to its rivalry. Financial performance reflects an organizations profitability and return on investment as compared to its competition (Hajiesmaeili et al., 2016). Korsita and Cania (2016) have measured organizational performance using two criteria at the same time namely financial indicators and market including return on investment (ROI), the market share difference of profit on sales, increased return on investment (ROI), increased sales, increased share the overall market and competitive position.

The researcher believes that financial and marketing measures are convenient to measure organizational performance. Based on this, the study will measure the performance of Ethiopian Pharmaceuticals Supply Agency by using marketing measures (market share, growth of sales, availability and competitive position) and financial measures (profitability).

2.5 Logistics Management Practices and Organizational Performance

Logistics as an integral part of the supply chain system provides the time and place utilities, and hence is able to enhance firm performance (kuswantoro and Rosli, 2012). Firms that have effective logistic processes can benefit from lower cost sourcing for mechanisms or work know-how. The effective sales in international markets demand building of an international

sales organization or relations with international partners extend supply chain (Korsita and Cania, 2016).

Firms adopt several business improvement approaches to enhance company performance. Logistics and supply chain management have been regarded to be the vibrant factor for the firms to acquire competitive edge (Li, 2014). The efficiency and effectiveness of the logistics operation has a substantial influence not only on the business performance of producers but also on the customer's perception of the quality of the goods and services delivered by the plant. Effective logistics management can provide major source of competitive advantage to a company by ensuring that it is able to continually respond faster and more efficiently than competitors to its customers' requirement on a global basis (Adebambo et al., 2016).

Logistics becomes the cornerstone of a new business strategy including time-based competition and core competencies. The winner in the logistics game will be an organization that provides the fastest product delivery and the shortest order cycle time in the strategy of time-based competition (Ackerman, 1997). Nowadays companies are placing better emphasis on logistics for different reasons: Customer service and satisfaction have become the showpieces of marketing strategy in numerous businesses, and distribution is an important customer service element. Businesses can gain a powerful competitive advantage by using better logistics to give customers faster delivery, improved service or lower prices (Kotler et al., 2005).

In a highly competitive market, logistics plays an important role, making the availability of products or services to customers at the right time and the right place. This practice also promotes high level of efficiency and effectiveness that leads to better result. Logistics management is the strategic vector in organizations that influences their performance management indices in terms of market share, profitability and overall effectiveness. Very poor management of logistics is imposing problematic constraints on the ordering process and inventory management which impressing the performance of the companies (Bagshaw, 2017).

Due to the trend of nationalization and globalization in recent decades, the prominence of logistics management has been emerging in many areas. For businesses, logistics supports to optimize the existing production and distribution processes based on same resources through management techniques. This logistics promotes the efficiency and competitiveness of

companies (Tseng et al., 2005).

2.6 Challenges of Logistics Management Practices

Nowadays, companies are faced with increasing competitive pressure, unpredictable market changes and dynamically changing regulations (Roth et al., 2013). Logistics is a practice which interfaces and interacts with the whole firm and with external businesses, sellers, customers, haulers and others. The movement of products from vendors to the delivery at customer's door is the main concern of logistics. This including moves through manufacturing facilities, warehouses and third-parties such as repackaging or distribution. It is not shipping and receiving or neither is it traffic or warehousing. Logistics must make work effectively, but is difficult to measure logistics success. There is also difficulty to show contribution of logistics to the organization and the value-added created by means of logistics. Logistics interacts with practically every section in a firm. Some activities are infrequent. Some are daily. They require integration and teamwork which are the opposites of what the traditional organization chart and its functional definition of tasks and responsibilities dictates. Logistics in many companies is not really understood. It can be regarded in mistaken or narrow terms.

The information flow fragmentation is the serious challenge of the logistics. Information integration allows inspecting the operations of the company in entirety and not in a fragmented and functionally isolated manner (Bagchi and Larsen, 2002). Integrated information must flow among the firm and its suppliers, haulers, forwarders, warehouses and consumers. It must also move internally between practices of purchasing, customer service, logistics, manufacturing, sales, marketing and accounting. Practicing this goes beyond Email, faxes and phone calls. Putting investment on information technology is not an alternative anymore. Instead, it is a prerequisite for logistics and business effectiveness.

The other challenge of logistics is the competence to respond to the dynamics of the international marketplace. Changing forecasts/quantification, customer requirements, new product introductions, new sourcing and how to manage all these changes--must be performed quickly. Raw materials and components must be well-ordered and arrive totally, precisely and quickly. Orders must be filled completely, accurately and quickly. Order is not extended for months or weeks for lead times. It may not even be days. Hours may decide

customer service, competitiveness and value-added. Back orders are not tolerated.

Increasing logistics cost is another challenge of logistics. Cost has always been the key indispensable measurements in evaluating the logistics performance (Bakar et al., 2014). Amongst several measures of logistics success cost is the key measure by which its effectiveness is often measured. Inventory, freight, warehouse labor, public warehouse charges and other items considered as logistics costs. Cost control, curb and management is significant for business lucrativeness. Reducing the cost of the numerous logistics elements namely freight and warehousing can sub optimize the effectiveness of the logistics group and of the firm in satisfying its clients.

Logistics infrastructure is required in order to transmit products and services to different producers and demand centers in different parts of the globe. Constraints with logistics infrastructure affect the logistics performance (Bakar et al., 2014). The collection of physical locations, transportation vehicles and supporting systems referred to as infrastructure. Through effective infrastructure the products and services are managed and ultimately delivered.

2.7 Key Logistics Processes

Logistics process encompasses number of processes that integrates in the course of applying each logistic management activities. Even though there are no major basic differences in the overall concepts and application of logistic activities across various types of businesses, key logistics processes vary between different companies, different sectors and different industries (Deliver, U. S. A. I. D., 2011). A typical process includes the following:

i. Order Fulfillment

Order fulfillment is an activity within the logistic process concerned with the ability to turn a customer's specified requirements into an actual delivered order through inclusion and implementation of many traditional functions. These traditional functions are recognized as being a part of the logistics operation. Order fulfillment also involves the information elements of receiving and documenting an order through to the physical means of selecting and delivering the goods.

ii. New Product Introduction

Relating to the introduction of new products into the marketplace there are numerous logistics issues. Things that are insufficient to enable a satisfactory launch of a new product are very often existing, standard logistics structures and processes. The incapability to respond sufficiently and quickly is the main problem. Dealing with known products standard processes are designed. Introducing new products using existing processes have two possible consequences. These are: (i) the product takes off very quickly and very well but there is inadequate flexibility in the supply chain to ratchet up supply to the required levels, (ii) demand is lower than initially anticipated and so there is an oversupply of stock, which eventually leads to products being sold off at discount rates or becoming obsolete.

iii. New Product Development

The idea in this process is to design the product so that it can reach the market as quickly as possible from the initial design plan through to availability.

iv. Product Returns

Providing with an effective process for the return of products is a growing requirement in several businesses. This product returns may happen as it will be reworked or repackaged to go into stock, product returns for succeeding disposal, or packaging returns that may be reused or scrapped. This is a very significant area for process design or redesign because of developments in environmental legislation.

v. After market or Service Parts Logistics

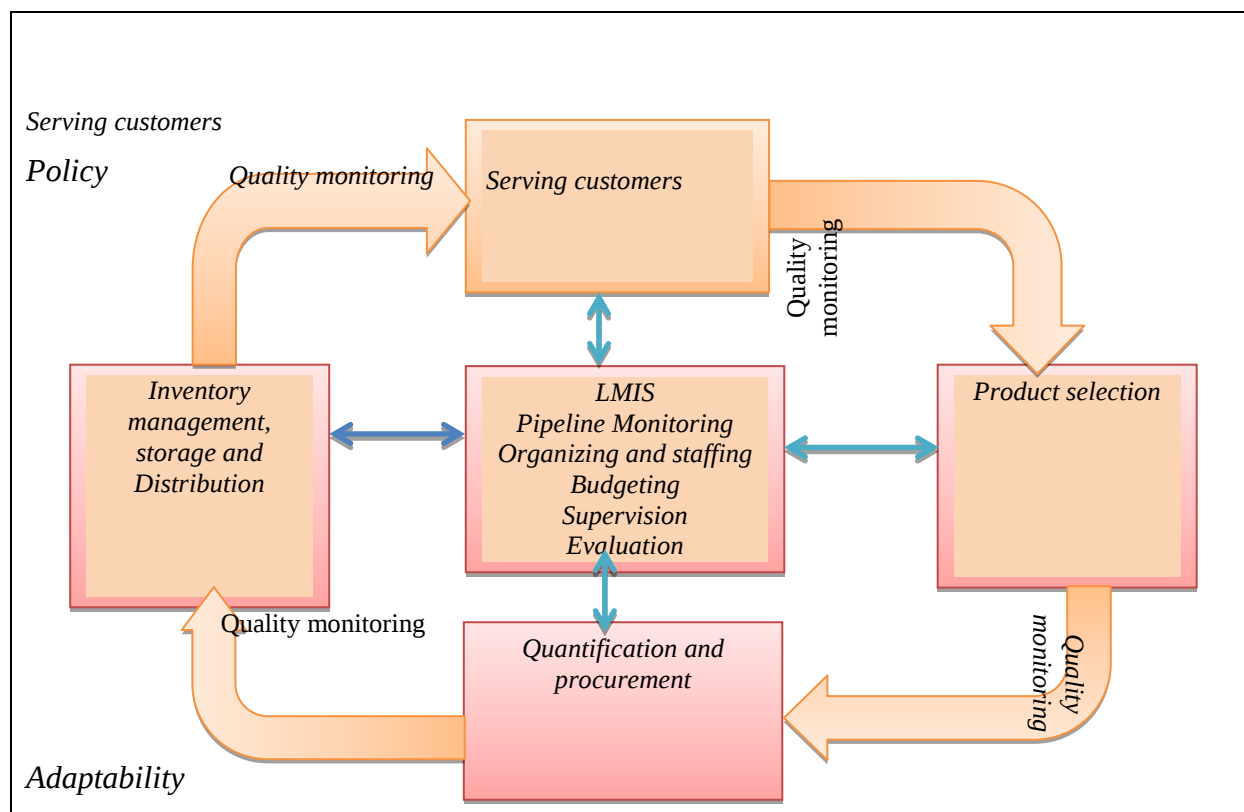
For several firms the supply of a product or chain of products is indissolubly connected to the subsequent provision of service parts to sustainance the uninterrupted use of the initial products. The ability to deliver a suitable support mechanism for the spare parts is indispensable for various logistics operations, neither the physical structure nor the associated processes for the original equipment (Deliver, U. S. A. I. D., 2011).

2.8 Logistics Cycle

This subtitle is a summary presentation of the scholarly work of the United State Aid for International Development (USAID) deliver project logistic hand book of A Practical Guide for the Supply Chain Management of Health Commodities, 2011. This subtitle explains the logistics cycle.

According to Deliver, U. S. A. I. D. (2011), logistics management includes a number of activities that support the seven rights. Subsequently, logisticians have developed a model to demonstrate the relationship between the undertakings in a logistics system. According to logisticians, these related activities referred to as the logistics cycle (see figure 2.1).

Figure 2. 1 Logistics Cycle



Source: (Deliver, U. S. A. I. D. project logistic hand book, 2011)

The cycle indicates the cyclical or repetitive nature of the various elements in the cycle. The activities of this logistics cycle depend on and are affected by the other activities inside the cycle. The undertakings in the center of the logistics cycle denote the management support functions that inform and influence the other components around its cycle (Deliver, U. S. A. I. D., 2011).

- Major activities in the cycle
- Heart of the logistics cycle
- Quality monitoring of the activities
- Logistics environment—policies and adaptability of the system.

2.9 Theoretical Literature Review

This subtitle is a summary presentation of the scholarly work of the Halldorsson Arni et al., (2007), “Complementary theories to supply chain management”, Supply Chain Management: An International Journal. In this section of the literature review four key theories, namely the Principal- Agent Theory (PAT), the transaction cost analysis/economies (TCA/E) theory, the network perspective and resource-based view (RBV) theory are comprised to support and explain the investigation.

Halldorson et al., (2007) tried to consolidate different organizational theories in to Supply chain management theories as follows:

2.9.1 Supply Chain Management (SCM) Mitigating Agency Problems: The Principal- Agent Theory (PAT)

Varies agency problems may arise due to the separation of ownership and control of economic activities between the agent and the principal. Asymmetric information among the principal and the agent, conflicting objectives, discrepancies in risk aversion, result ambiguity and behavior based on self-interest and bounded rationality are considered to be as the main difficulties. The contract between the principal and the agent governs the relationships between the two parties and the aim of the theory is to design a contract that can mitigate potential agency problems. The right mix of behavioral and outcome-based incentives to motivate the agent to act in the interests of the principal is the most efficient contract that must include in it. (Eisenhardt, 1998; Logan, 2000).

In Supply Chain Management the alignment of incentives is a significant concern. The hidden actions or hidden information is the main cause of misalignment. Misalignment can be mitigated through creating contracts with supply chain partners that balance rewards and penalties (Narayanan and Raman, 2004; Baiman and Rajan, 2002).

2.9.2 Supply Chain Management (SCM) as Coordination of Transferred Rights of Disposals-Transaction Cost Analysis/Economies (TCA/E)

Transaction Cost Analysis offers a normative economic approach to determine the firm's boundaries and can be used to present efficiency as a motive for entering inter-organizational arrangements (Williamson, 1997, 1985, 1996). A business may decrease its total transaction costs (costs of contact, contract and control) through collaborating with external partners.

Supply chain management relationships are represented by the hybrid of governance between markets and hierarchies. Asset specificity this means that limited value in an alternative application namely physical, site, human and dedicated assets are the most powerful attribute of the transaction (Rindfleisch and Heid, 1997). Behavioral assumptions of bounded rationality and the risk of being subject to opportunistic behavior from a partner also influence the transaction costs. Insufficient information, limits in management perception or limited capacity for information processing might be the causes of the presence of bounded rationality. Mechanisms for mitigating the risk of opportunism include Safeguards and credible commitments are the crucial mechanisms for mitigating the risk of opportunism. These safeguards and credible commitments are long-term contracts, penalty clauses if a partner fails to fulfill the contract, equity sharing and joint investments. Trust among the parties is relying upon calculated risk and not on personal trust between individuals.

In make-or-buy decisions in supply chains transaction cost analysis has often been required. Examples are outsourcing of logistics activities, buyer-supplier relationships and restructuring of supply chains. In essence, transaction cost analysis is a useful instrument to decide whether a transaction should be performed in the marketplace or in-house. Transaction Cost Analysis focuses mainly on appropriation concerns, which originate from the behavioral assumptions of bounded rationality and opportunism (Knioppen & Christiaans, 2007).

2.9.3 Supply Chain Management (SCM) as Reciprocated Interactions between Institutions -The Network Perspective

The performance of a company relies not only on how well these partners cooperate with their own business partners, but also on how capably it cooperates with its direct partners.. A basis for the conceptual analysis of reciprocity in cooperative relationships could be provided by the network perspective. In the development of new resources, the company's continuous interaction with other player is a significant factor. Relationships combine the resources of two firms to accomplish further advantages than through single efforts (Haakansson and Ford, 2002).

The value of a resource is relying upon its amalgamation with other resources. Due to this reason inter-organizational bonds may become more significant than owning resources. Hence, the structure of the supply chain is determined by the resource structure and becomes its motivating power. An understanding of the dynamics of inter-organizational relations by

emphasizing the importance of personal chemistry between the parties, the build-up of trust through constructive long-term cooperative relations and the mutual adaptation of practices and systems through exchange processes profoundly contributed by the network perspective theory. Through direct communication, the relationships take a sense of uniqueness, ultimately resulting in supply chains as customization to meet individual customer requirements. Through the social exchange processes the parties gradually build up mutual trust. However, a network is in a constant state of movement and change, it does not seek an optimal equilibrium. Links between firms in a network develop through two separate but closely linked types of interaction: Exchange processes (information, goods and services, and social processes) and Adaptation processes namely personal, administrative practical, legal and logistics elements (Johanson and Mattsson (1987).

2.9.4 Supply Chain Management (SCM) as Coordination of Relational Assets – The Resource-Based View (RBV)

The fundamentals of resource-based view theory rely on companies constituted by resources sets that give them a competitive advantage. The Resource-Based View deals with competitive advantages related to the firm's possession of heterogeneous resources (financial, physical, human, technological, organization and reputations) and capabilities. The core competence of the specific company and serve eventually as its source of competitive advantage are the heterogeneous resources and capabilities possessed by the firms. Four barriers may prevent competitors from imitating a firm's resources and capabilities: Durability, transparency, transferability and replicate ability (Prahalad and Hamel, 1990).

The more dynamic aspects of the Resource-Based View consider a firm's core competence to be its ability to react quickly to situational changes and build further competencies or dynamic capabilities. Thus, the configuration of resources and capabilities as the markets evolve are associated with the company's competitiveness. However, inter-organizational relationships may also facilitate and advance the learning processes of individual firms. As such, relationships are not only learning oriented but also output-oriented. Efficiency may not only be explained the opportunity to access another organization's core competencies through cooperative preparations as an alternative to building such competencies in house, but also in terms of productivity or operational measures (Eisenhardt and Martin, 2000).

The Resource-Based View is an implicit assumption in many supply chain decisions. The ideas of focusing on core competencies and on outsourcing complementary competencies to

external partners are critical issues for outsourcing decisions. Third party Logistics and outsourcing of standard components and processes to subcontractors are examples. However, outsourcing of design, or software development is often a way of gaining access to other supply members' core competencies through inter-organizational collaboration (Halldorson, et.al., 2007).

The complex sets of relationships between supply-related business partners are supply networks. Business partners' capability of creating value and the ultimate test of value is how end clients perceive and evaluate the offerings with competing networks is a basic issue for all types of networks. Firms actively exchange resources in their operation. Intentional nets of actors are a form of collaboration, in which the main elements or components from management can be recognized. In addition, it is possible to identify the different but simultaneously extant modes of management, and it's proposed that in the supply net context they are influencing, controlling and monitoring, coordination and integration.

2.10 Summary of Review

This section presents the synopses of all the issues were discussed in the above reviews of related literature wrote by different authors.

The history and advancement of logistics were discussed. Logistics was a military activity concerned with getting soldiers and arms to the battle front. In its advancement, the six phases of logistics developments are workplace logistics, facility logistics, corporate logistics, supply chain logistics, global logistics and next-generation logistics. Regarding the definition of logistics different scholars gave varies explanation. Hence, Logistics defined as the management of order processing, inventory, transportation and the combination of warehousing, materials handling and packaging, all integrated throughout a network of facilities. Moreover, logistics is the strategic management of movement, storage and information relating to materials, parts and finished goods in supply chains, through the stages of procurement, work-in-progress and final distribution.

A supply chain is composed of all the organizations included in the design, manufacture and distribution of a product to market. The effective supply chain management is the integration of production, inventory, site and transportation among the participants in a supply chain to achieve the best combination of responsiveness and efficiency for the market being served is

referred to as supply chain management. Increasing sales of products and services to the ultimate consumer while at the same time reducing both inventory and operating costs is the primary objective of the supply chain management. Aligning the supply chains of firms with the demands of the markets they serve is the crucial practice to achieve competitive markets. Nowadays, supply chain performance is a distinct competitive advantage for organizations that outshine in this area. The participants of supply chain are producers, distributors, retailers, customers and service providers.

The customer service, inventory management, transportation, storage and materials handling, packaging, information processing, demand forecasting, production planning, purchasing, facility location and other activities are the important components of the logistics system. Organizational performance and its relation with that logistics management practices were also discussed. The performance measurement of the study are financial (profitability and growth in sales) and markets measures (market share, availability and competitive position) which are influenced by logistics management practices. The challenges faced by every company in respect of logistics management were also presented.

The related review section consists of key logistics processes namely order fulfillment, new product Introduction, new product development, product returns, after market or service parts logistics, information management which are vital in the supply chain arena. Furthermore, chapter two revealed that the logistics cycle and participation of supply chain management were considered as critical issues of supply chain management.

There are various supply chain management theories developed. The four fundamental theories have been reviewed. These are The Principal- Agent Theory (PAT) that intends to design a contract that can mitigate potential agency problems, followed by Transactional Cost Analysis/Economics theory which relies on companies existing to maximize their profits through reducing their transaction costs. Moreover, the Network Perspective theory provides profoundly to an understanding of the dynamics of inter-organizational relations by underlining the prominence of personal chemistry among the parties, the build-up of trust through constructive long-term supportive relations. The fourth theory was Resource Based Theory (RBT) that relies on companies that are constituted by resources sets that give them a competitive advantage.

The conceptual framework of the study adopted from prior researcher and supported by the review of related literature was presented in the chapter.

Finally, empirical review was presented that will support the findings of the study shown in the chapter four below and the proposed hypotheses which are presented at the last part of this chapter.

2.11 Empirical Aspects of Review

This section of the literature review includes the global studies from prior researchers and books about the relationship between logistics management practices and organizational performance.

According to Nyaberi and Mwangangi (2014), order process logistics management practices contribute to increase in profit, production levels, service delivery, sales volume and quality of good. This, therefore, shows that the importance of logistics management in any of the organization cannot be underrated. It should be the core interest of the business to formulate and design order processing logistics practices to enhance performance. According to them, inventory control logistics management assists to reduce costs of maintenance of stock, to maintain quality of the product, to improve production flow and to reduce cost of breakages. This in turn leads to customer good will and a high volume of sales, hence improvement in overall performance of the business.

A business must have agility in the marketplace to survive and succeed in today's turbulent competitive environment. Hence, logistics has come to be an increasing area of strategic concern for organizations (Olavarrieta and Ellinger, 1997). In their study of logistics, strategy and structure: Stock et al. (1998) argued that as competition shifts from head to head competition between firms to competition between supply chains, competitive success will rely on progressively on the capability to coordinate and assimilate the manufacture undertakings at geographically dispersed and organizationally separate locations. These "new" companies' logistics will place a high precedence on inter-firm assimilation of logistics practices and sustainable business success. A study done by Nge et al., (2016) concluded that logistics activities, factors of logistics activities and critical factors affecting those logistics practices are significant elements for organizational performance. The superior organizational performance is associated with the emphasis of the enhancement of logistics capabilities (Olavarrieta and Ellinger, 1997).

A study done by Muslimin et al. (2015) shows that logistics operation has a significant impact on financial performance. According to them logistics cost and service qualities have positive impact on financial performance. According to the study conducted by Tilokavichai et al. (2012) about linkages between logistics information systems and logistics performance management under uncertainty companies can achieve more efficient and higher performance if they systematically plan their logistics management strategy. In their study of logistics in the hospital: methodology for measuring performance, Serrou and Abouabdellah (2016) have shown the importance of logistics costs in health institutions, as well as performance analysis via the cost, safety and quality.

From the research conducted by Tabeni (2006) about the impact of inbound logistics activities on the operational performance of the postal services organization in South Africa, It has been revealed that, there exists significant relationship between logistics activities and the operational performance of the business. According to this study, it has been supported that inbound logistics activities and revenue generation are positively correlated. The research concluded that whatever improvement is done in respect of logistics will help to enhance business performance in terms of increased revenue generated in a very cost effective way.

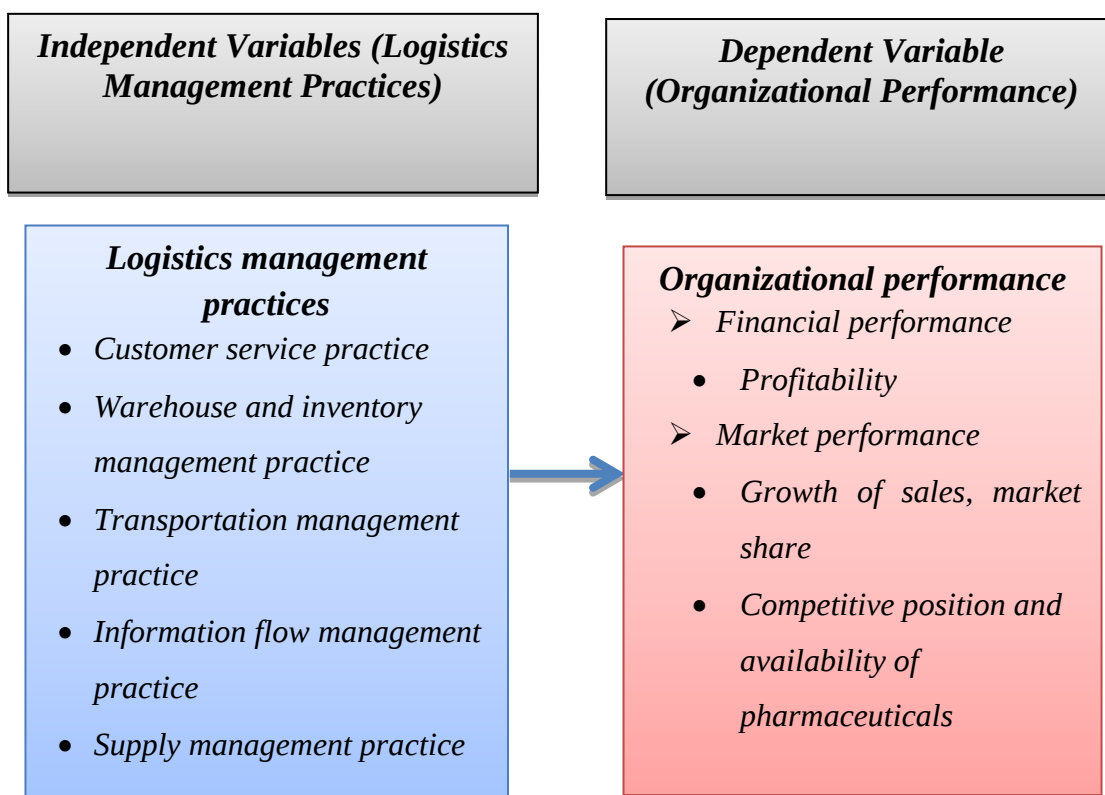
Kuswanto and Rosli (2012) in their study Logistics Efficiency and Firm Performance: Evidence from Indonesian Small and Medium Enterprises, showed significant impact of logistics innovations in information sharing and transportation coordination on firm performance is sufficient to explain the variation in performance. In addition, the finding of this study showed that the application of information technology, such as the internet enables firms to improve their market knowledge and relationship with clients and suppliers within the same value chain. This would improve logistics efficiency in terms of costs and delivery time and finally the performance. In addition, innovative transportation coordination was found to improve logistics efficiency, which directly influenced performance.

Staying competitively in the global race and for improving profitability understanding and practicing of supply chain management is the vital precondition. According to Georgina A. and Daniel M (2015), the logistics management practices and organizational performance indicate that warehousing, transport, information flow and physical distribution management positively correlate with operational efficiency of an organization (Georgina A. and Daniel M, 2015).

2.12 Conceptual Framework

According to Wilson et al., (2015), conceptual framework can be defined as a visual or written product, one that “elucidates either graphically or in narrative system, the main issues to be investigated. This model also explains concepts, variables and the presumed relationship among the variables.” The researcher in such ways adopts the conceptual framework in which the figure below illustrates the research questions, literatures and presumed relationship between the logistics management practices and organizational performance.

Figure 2. 1 Conceptual framework



Source: Adopted from Mwangangi (2016) with modification

Considering the different practices of supply chain and logistics management and measurement of organizational performance, this study adopts the logistics management practices of customer service, warehouse and inventory management, transportation management, information flow management and supply management practices as independent variable. Besides, the researcher determines organizational performance which includes level of customer satisfaction, financial performance, market performance and availability of pharmaceuticals as dependent variable Mwangangi (2016).

2.13 Hypothesis of the study

According to Kothari (2004), hypothesis is a logical conjectured relationship between two or more variables expressed in the form of testable statements. It is a formal statement of an unproven proposition that is empirically testable (Zikmund, et al., 2009). Moreover, hypothesis testing is undertaken to explain the variance in the dependent variable or to predict organizational outcomes (Sekaran, 2000). Accordingly, for the purpose of this study, the following 5 (five) hypotheses are formulated based on previous research findings from literature, and were tested. These are, therefore, the proposed overall effect of logistics management practices on organizational performance which can be best described by the following hypotheses:

Hypothesis 1: Customer service practice has significant and positive effect on organizational performance.

Hypothesis 2: Warehouse and inventory management practice has significant and positive effect on organizational performance.

Hypothesis 3: Transport management practice has significant and positive effect on organizational performance.

Hypothesis 4: Information flow management practice has significant and positive effect on organizational performance.

Hypothesis 5: Supply management practice has significant and positive effect on organizational Performance.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter explains the research methodology which was employed in the study. According to Kothari (2004), Research methodology is a method to scientifically solve the research problem. It may be expected as a science of studying in what way research is performed systematically.

The chapter is arranged into different sub sections, starting from description of the study area, followed by research method, research design, population, sample size and sampling techniques, data sources and types, data collection procedures, measurement of instrument and method of data analysis. Additionally, Ethical consideration and Reliability and Validity of instruments were presented in the chapter.

3.1 Description of The Study Area

This specific topic refers to where the research was taking place or the data used in this study was collected. Therefore, the agency selected for this study is Ethiopian Pharmaceuticals Supply Agency (EPSA). This Agency was established in September 2007 by Proclamation No. 553/2007 to supply quality assured and affordable pharmaceuticals to all public health facilities in the country. The Ethiopian Pharmaceuticals Supply Agency (EPSA) is effected to ensure continuous availability of pharmaceuticals, medical equipment and supplies through enhancing its financial and human resources capacity, implementing need-based efficient pool procurement and implementing modern inventory management system to meet the ever-increasing demand of health commodities. Alongside the supply of pharmaceuticals, the Agency has been working hard to institute systems and build capacity of the workforce involved in pharmaceuticals supply chain management at all levels. With the aim of improving the continuous availability of health commodities at an affordable price in a sustainable manner, the sector's capacity in procuring and distributing pharmaceuticals through the Revolving Drug Fund (RDF) and numerous programs has improved significantly.

The agency has made remarkable achievements since its establishment in all supply chain operations. Typical cases are the procurement volume increase by more than tenfold and distribution by more than twentyfold compared with the levels at establishment of the agency. The direct delivery of items and branch expansion are also very significant. The Agency's

overall operation is growing immensely every year and the annual turnover/ transaction has reached to more than 11.5 Billion Birr.

Since 2010 the Integrated Pharmaceuticals Logistics System (IPLS) has been implemented to integrate the supply management of pharmaceuticals that were previously managed in old-fashioned manner is improving availability of essential pharmaceuticals and other medical commodities at service delivery points (SDPs), namely health facilities. The integrated pharmaceuticals supply logistic system in Ethiopia is guided by the National health policy, the national drug policy and the national Growth and Transformation plan. It is also constitute the health sector development program, the pharmaceuticals logistic master plan and strategic plan. The Integrated Pharmaceuticals Logistics System (IPLS) has been developed to be implemented from 2015/16 - 2019/20 to ensure the continuous supply of quality essential pharmaceuticals necessary for the achievement of the targets set in the Health Sector Transformation Plan (HSTP).

The Agency is organized into core and supportive operational processes. The Head Office level, it is structured under one Director General and four Deputy Director General plus 19 Directorate. Out of these, 9 Directorates are working on core operational areas and the rest of them are working in supportive positions. The Agency is making itself more accessible to health facilities through establishing new branches at strategic locations throughout the country. At the inception of the Agency, it was indicated in the Pharmaceutical Logistics Master Plan that a total of 23 branches were required for the Agency to be accessible to public health facilities within a radius of 180 to 300 kilometers. Currently, the number of branches is nineteen (19) throughout the country. A total of 18 modern warehouses were constructed at the center the existing and new branches of the agency during the last five years.

The Agency started its operation with 24 Trucks transferred from the former PHARMID (that was its previous name, it was governmental enterprise) and 6 Heavy and medium size trucks donated by the Federal Ministry of Health. The Agency received trucks from different development partners and through Global Fund support. This has increased the total number of medium and heavy trucks from 65 at the end of 2002 E.C to 189 in 2011 E.C budget year. The Agency has 21 refrigerated trucks that are currently operating to support the national cold chain system.

As per the Human Resource Management and Development Directorate report on March 30, 2020, the Agency's human resource size before nine years was 1488 out of which 1122 were males and 366 were females. Currently, the agency (Head Office and its 19 branch offices) has a total number of employees of 2985. Out of this 2139 (71.66%) are males and 846 (28.34%) are females with different educational backgrounds. The total combined both the Head Office and branches throughout the country. But, the Head Office total number of employees is 641. Out of this 412 (64.27%) are men while 229 (35.73%) are women (EPSA Profile, 2020). The information from the study was conducted from December, 2019 to May, 2020.

3.2 Research Method

According to Creswell (2007), there are three approaches available for researchers to design their research methodology namely Quantitative, Qualitative and Mixed research approaches. According to Kothari (2004), quantitative approach contains the group of data in quantitative form which can be subjected to difficult quantitative analysis in a formal and informal manner. On the other hand, qualitative approach is concerned with subjective assessment of attitudes, opinions and behavior. Thus, for this study the researcher used quantitative research approach, as quantitative technique helps to explore, present, describe and examine relationships and trends within data and as it also supports to collect results in numerical and standardized data (Saunders, Lewis and Thorhill, 2009).

3.3 Research Design

Research design is the conceptual structure within which research is conducted; it contains the blueprint for fulfilling research objectives and answering research questions (C.R.Kothari, 2004). It ensures that the study would address to the problem. The same authors discuss three types of research design: They are exploratory- discovery of ideas and insights, descriptive which is concerned with determining the frequency with which an event occurs or with relationship between variables, and explanatory which deals with hypothesis testing. According to Kumar (2005) and Saunders, et.al (2009), the major aim of descriptive study is to describe and provide information on what is available regarding a group of people, community and situation. Explanatory research establishes causal relationships between variables. The study aims to examining the relationship between logistics management practices and organizational performance of Ethiopian Pharmaceuticals Supply Agency. To test the hypotheses of the study descriptive and explanatory research designs were considered

as appropriate. Thus, descriptive and explanatory research designs were employed to conduct the study.

3.4 Target Population

According to Saunders, et.al (2009), population is a full target group from which a sample is taken. It is the total number of subjects targeted by the study or the group of elements to which the researcher wants to make inference (Mundia et al., 2015). Accordingly, all employees working in Ethiopian Pharmaceutical Supply Agency's Head Office were considered as source population. Thus, the researcher took those employees of the agency as a study population to the intended research. In the study, to get the right respondents with right knowledge, exposure and experience about the research area, the researcher applied the inclusion and exclusion criteria. These are explained below:

3.4.1 Inclusion Criteria

All employees of the Agency's Head Office who have been working in the logistics management and related departments at least for the last 2 years were included as the respondents to the study. Accordingly, employees working in:

- Quantification and Market Shaping Directorate
- Contract Management Directorate
- Tender Management Directorate
- Warehouse and Inventory Management Directorate
- Distribution and Fleet Management Directorate
- Capacity Building and Operational Research Directorate
- Laboratory Quality Control Directorate
- Program/Project Fund Directorate and
- Revolving Drug Fund Directorate having at least 2 years of work experience were included to be the sample respondent to the study.

3.4.2 Exclusion Criteria

Employees who have been working for less than 2 years in the logistics management or in related departments were excluded to be taken as respondents to the research. Moreover, all employees working in departments which are not related with logistics management practices and departments and those who refuse to be taken for respondents will be excluded to be constituted as respondents of the intended research undertakings. The total number of

employees who have been working at least 2 years in these working units was **234** based on employee's information taken from Human Resource Administration and Development directorate in 2020.

3.5 Sampling Techniques and Sample Size

According to Kothari (2004), when the field of inquiry is large, considerations of time and cost almost invariably lead to sampling. The respondents sampled should be as representative of the total population. The respondents constitute what is technically called a 'sample', the selection process is called 'sampling technique' and the number of items to be designated from the population to constitute a sample is called 'sample size'.

The sampling technique in this study was stratified random sampling method. If a population does not constitute a homogeneous cluster, stratified sampling technique is generally applied to get a representative sample. Under stratified sampling the population is divided into several sub-populations that are individually more homogeneous than the total population and then items take from each stratum to constitute a sample. Since each stratum is more homogeneous than the total population, stratified random sampling enables to get more precise estimates for each stratum. As the target population (employees of Ethiopian Pharmaceuticals supply Agency who have been working at least for 2 years in logistics management and in related working units shown above). It is more appropriate to use stratified sampling to draw representative from all working units (strata).

Size of the sample refers to the number of items to be taken from the population to constitute a sample. According to Kothari (2004), the size of sample should neither be excessively large nor too small. To get a representative sample for the population under study for which the size is known, Yamane's (1967) provides a simplified formula to calculate sample size.

$$n = \frac{N}{1 + N * (e)^2}$$

Where, n= sample size

N= population size

e= the desired level of precision or Tolerance at desired level of confidence, take **0.05** at 95% confidence level for this study.

So based on Yamane's formula sample size is determined as follows:

$$n = 234 / 1 + 234 * (0.05)^2$$

$$n = 234 / 1.585$$

$$n = \underline{\underline{148}}$$

Accordingly, the number of sample items from the total population of 234 employees was **148**. In order to determine the number of sample items from each stratum, the questionnaires with sample size 148 are distributed as follows:

Table 3. 1: Tabular view of sampling plan and Sampling Frame

Strata by working unit	Target Population (N)	Sampling Fraction $I=M(Ni/P)$	Sample Size (I)
Quantification and Market Shaping Directorate	22	148(22/234)	14
Tender Management Directorate	27	148(27/234)	17
Program/Project Fund Directorate	16	148(16/234)	10
Revolving Drug Fund Directorate	17	148(17/234)	11
Contract Management Directorate	36	148(36/234)	23
Warehouse and Inventory Management Directorate	59	148(59/234)	37
Capacity Building and Operational Research Directorate	10	148(10/234)	6
Distribution and Fleet Management Directorate	41	148(41/234)	26
Laboratory Quality and control Directorate	6	148(6/234)	4
Total	234	148(234/234)	148

Source: Researcher, based on data from Ethiopian Pharmaceuticals Supply Agency, Human Resource Management and Development Directorate, 2020

3.6 Data Source and Collection Procedures

To collect relevant data both primary and secondary data sources were used. The primary data was collected using questionnaires. Questionnaires were distributed personally by researcher visiting all stratum. To maintain the validity of the constructs and scale used in this research, most of the questions were adopted from previous researches conducted by Mwangangi (2016) and Stewart (2011) with little modifications and some of the questions were developed based on careful review of literature. Secondary data were collected from unpublished materials of Ethiopian Pharmaceuticals Supply Agency, journals, books and internet.

3.7 Measurement Instruments

The study used a questionnaire system to collect primary data. The questionnaire was intended to inquire answers in the form of open-ended and close-ended questions. The questionnaire had four sections. The first section (section A) contained questions that helped to generate general information about respondents like gender, education level, working unit/department and work experience. The second section (section B) represented the logistics management practices of Ethiopian Pharmaceuticals Supply Agency and the third section (section C) considered the relationship between logistics management practices and organizational performance of Ethiopian Pharmaceuticals Supply agency. The last section (section D) addressed the challenges faced by Ethiopian Pharmaceuticals Supply agency in managing its logistics management practices. Five-point Likert scale was used to rate items in the questionnaire. The questionnaire was self-administered by the researcher through drop and pick techniques.

3.8 Pilot Test of Research Instruments

According to Hassan et al. (2006), a pilot test is one of the significant stages in a research. It is conducted to detect possible problem areas and deficiencies in the study instruments prior to implementation during the full study. According to Hazzi and Maldaon (2015), the reasonable number for conducting a pilot study commonly from 10% to 20% of the main sample size. To ensure that the measurement instrument (questionnaire) was understandable and appropriate and that the questions were well defined and offered in a reliable manner; conducting the pilot study was crucial. Pilot test was undertaken prior to the main study by selecting 15 respondents (12% of the main sample size) from the target population (2 respondents from each population stratum) and issuing them questionnaire. The selected respondents for the pilot test were asked to answer if the study instrument(s) is asking the intended questions, the format is understandable and the selected tool is appropriate for the target population. The feedback from the pilot test helped in deleting and adjusting some of the items in the measuring instruments. The respondents who were participating in the pilot test were not again used in the main research.

3.9 Data Analysis

After collection of the data, its completeness was verified, coded and entered in computer using SPSS. The data was subject to analysis using application software packages known as Statistical Package for Social Sciences (SPSS) of version 24. Through descriptive and

inferential statistics data analysis was done. According to Boone and Boone (2012), Likert scale data are analyzed at the interval measurement scale. Therefore, the composite score for Likert scales was analyzed at the interval scale. In descriptive statistics for interval scale items there are mean and standard deviation. The mean used for central tendency and standard deviations for variability. The Pearson's r, Model summary, ANOVA and regression procedures are also appropriate analysis procedure for interval scale items.

3.9.1 Descriptive Statistical Analysis

Descriptive statistics was used to describe different characteristics. The researcher applied frequencies and percentages to analyze general information about respondents. The researcher applied also mean and standard deviation to describe the statuses of logistics management practices and logistics management challenges and to measure variation. The outcomes of the research were presented using tables accompanied with descriptions.

3.9.2 Inferential Statistical Analysis

In Inferential statistical analysis the researcher applied correlation and multiple linear regression analysis. Correlation analysis used to determine the relationship between the independent variable (logistics management practices) and dependent variable (organizational performance). A multiple linear regression used to test the influence of logistics management practices on organizational performance. The results are presented using tables taking from the SPSS outcomes that shown in the next chapter. Each table was accompanied by result interpretation. Correlation and a multiple linear regression are explained below.

A. Correlation Analysis

Correlation may be defined as the degree of relationship existing between two or more variables (Koutsoyiannis, 1977). The linear correlation coefficient (r) is a measure of the degree of covariability of the variables. The strength and the direction of a linear relationship between the two variables (dependent and independent) are measured by the linear correlation coefficient (r). The values that the correlation coefficient may assume vary from -1 to +1. When r is positive, there exists a positive correlation between the variables. $r = +1$ implies that there is a perfect positive correlation between variables. When r is negative, there exists a negative correlation between the variables. $r = -1$ implies that there is a perfect negative correlation between variables. When r is zero, then the variables are not correlated. The closer the value of r is to one, the greater is the degree of covariability. On the other

hand, the closer the value of r is to zero, the lesser is the degree of the covariability. According to Samuel and Okey (2015), the linear correlation coefficient is sometimes known as the Pearson Product Moment Correlation Coefficient in honor of its developer Karl Pearson.

As statistical estimation, r is unavoidably subject to some error and should be verified for its consistency by conducting some test of significance (Koutsoyiannis, 1977). While computing a correlation, the level of significance shall be set at 95% with alpha value of 0.05).

B. Multiple Regression Analysis

The term regression was introduced by Francis Galton (Gujarati, 2004). The investigation of the dependency of one variable, the dependent variable, on one or more other variables, the explanatory variables is referred to as Regression analysis. The multiple regression analysis was used to determine whether logistics management practices have influenced the organizational performance of Ethiopian Pharmaceuticals Supply Agency. The study took the five determinant factors as independent variables and the organizational performance as dependent variable in the regression model. The study used the following multiple regression model to establish the statistical significance of the independent variables on the dependent variable.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon$$

Where:

Y = Organizational performance of the Ethiopian Pharmaceuticals Supply Agency

β_0 = Constant (value of organizational performance (Y) when (X_1, X_2, X_3, X_4 and X_5) all five logistics management practices = 0)

β_1 = Regression coefficient for level of customer service practice

X_1 = Customer service practice

X_2 = Warehouse and inventory management practice

β_2 = Regression coefficient for level of warehouse and inventory management practice

X_3 = Warehouse and inventory management practice

β_3 = Regression coefficient for level of transportation management practice

X_3 = Transportation management practice

β_4 = Regression coefficient for level of information flow management practice

X4 = Information flow management practice

B5 = Regression coefficient for level of supply management practice

X5 = Supply management practice

In the model, β_0 = Constant, β_1 to β_6 = Regression coefficients represented the mean change in the dependent variable for one unit of change in the independent variable while holding other independent variables in the model constant and ϵ = error term which captures the unexplained variation in the model.

3.10 Validity and Reliability

3.10.1 Validity

Validity is the extent to which a test accurately measures what it claims to measure (Lakshmi and Mohideen, 2013). According to Kindy et al. (2016), content validity is the extent to which the item in an instrument covers the entire range of the significant aspects of the area being investigated. It is the degree to which the measurement device, in this case, the measuring questions in the questionnaire, provides sufficient coverage of the research investigative questions. In addition, pilot testing of questionnaires was conducted to obtain a feedback from the respondent on validity and responses were collected and questionnaire was adjusted subsequently.

3.10.2 Reliability

According to Kothari (2004), reliability refers to consistency, where internal consistency involves correlating the responses to each question in the questionnaire with those other questions in the questionnaire. The term reliability defined as the consistency or stability of measurement over a variety of situations in which basically similar outcomes should be obtained.

The most popular method of testing for internal consistency in the behavioral sciences is Cronbach's alpha. Cronbach's alpha reliability/consistency coefficient normally spreads/ranges between 0 and 1. According to Gliem and Gliem (2003), the following rule of thumb is provided. These are:

- if " $\alpha > 0.9$ " it will be excellent
- $\alpha > 0.8$ it will be good
- $\alpha > 0.7$ it will be acceptable

- $\alpha > 0.6$ it will be questionable
- $\alpha > 0.5$ it will be poor and
- Finally, $\alpha < 0.5$ it will be unacceptable”.

Cronbach’s alpha was computed and compared with the threshold value of 0.7. An overall value of 0.868 was obtained as indicated in Cronbach’s alpha reliability test table below (table 3.2), which implied high level of internal consistency of research instruments.

Table 3. 2: Cronbach’s alpha reliability test

S. N	Instrument Dimension	Cronbach’s alpha	No. of Items	Reliability
1	Customer service practice	0.826	6	Good
2	Warehouse and inventory management practice	0.926	14	Excellent
3	Transport management practice	0.908	7	Excellent
4	Information flow management practice	0.898	6	Good
5	Supply management practice	0.896	7	Good
6	Organizational performance	0.884	6	Good
7	Challenges of logistics management practices	0.735	10	Acceptable
Overall		0.868	56	Good

Source: researcher, 2020

3.11 Ethical Consideration

According to Leedy and Ormrod, (2013), in doing any research, there is an ethical responsibility to do the work honestly and with integrity. The basic principle of ethical research is to preserve and protect the human dignity and rights of all subjects involved in a research. Moreover, ethics is the norms or standards for conduct that distinguishes between right and wrong. It helps to determine the difference between acceptable and unacceptable behaviors. Ethics is particularly significant components throughout the research procedures and if failed to be taken into account, it can lead to misinterpretation or even invalid conclusions. Hence, this study did not go under any form of bias or change, and the researcher respected the issues such as honesty, objectivity and respect for intellectual property, social responsibility, confidentiality and non-discrimination, among others.

Before the data was collected, the ethical issues were taken in to consideration. Appropriate communication was made with the staff of the Agency. During data collection respondents were informed about the objective of the research and the researcher assured that the

respondent's information was confidential. The respondents also informed verbally as well as in writing that any information obtained through questionnaire will be purely used for academic purpose and handled with the highest order of confidentiality. Anyone who was not interested to be in the study was not included in the study. For the purpose of respondents' security their names were not written on the questionnaire. Hence the study was not raising any ethical anxiety.

CHAPTER FOUR

DATA ANALYSIS, RESEARCH FINDINGS AND DISCUSSION

4 Introduction

This chapter presents the data analysis, research findings and discussions in the light of the research objectives and research questions stated in the first chapter of the study. The primary focus of this study is to establish the relationship between logistics management practices and organizational performance of Ethiopian Pharmaceuticals Supply Agency. The first part of the questionnaire consists of demographic information of the respondents as presented in the tables below. The second part of the questionnaire presented the descriptive analysis on variables of the study and the next part dealt with the results of regression and correlation between the variables (independent and dependent). In this analysis Statistical Package for Social Science (SPSS) of version 24 computer software program was used to make the necessary calculations.

4.1 Response Rate

Response rate is formally defined as the number of completed questionnaires divided by the number of eligible sample members (Frohlich, 2001). Response rates are generally considered to be the most widely compared statistic for judging the quality of surveys (Johnson and Owens, 2008). There is no exact response rate that assures an unbiased representation of the population. As an overall rule of thumb, most researchers look for a response rate $\geq 70\%$ (Rubinfeld, 2004). As shown in the table below (table 4.1), a total of 148 questionnaires were distributed. Out of the 148 questionnaires, 140 were filled properly and returned to the researcher which represents a response rate of 94.6%. This percentage was considered acceptable for the study as it is higher than the general response rate rule of thumb.

Table 4. 1: Response rate

Response status	Frequency	Percentage
Filled and returned	140	94.6
Not returned	8	5.4
Total	148	100

Source: Researcher, 2020

4.2 Respondents General Information

This section presents general information about respondents. The general information collected was on gender, level of education, work unit and work experience. Gender was included to signify the involvement of both genders in the study. The level of education was important to imply that the respondents were well educated and had the ability to understand and respond to the issues sought by the study. Work unit was required to infer that the respondents were able to understand the different logistics practices sought by the research. Work experience was important to ensure aspects of familiarity and experience of the respondents in matters of logistics management practices.

4.2.1 Gender of Respondents

The investigation established and found gender details of the respondents as presented in table 4.2.

Table 4. 2: Gender of respondents

Gender	Frequency	Percent	Cumulative Percent
Male	98	70.0	70.0
Female	42	30.0	100.0
Total	140	100.0	

Source: Researcher, 2020

From the table 4.2, the study established that 70.0% of the respondents were male and 29.3% were females. From this finding one can infer that both genders were fairly involved in the study because the ratio of gender in the population is also similar to this finding. Hence the finding of the study did not suffer from gender bias.

4.2.2 Education Level of Respondents

The study sought to determine the education level of respondents and the responses were analyzed as shown in table 4.3 below:

Table 4.3: Educational level of respondents

Education Level	Frequency	Percent	Cumulative Percent
Diploma	15	10.7	10.7
First Degree	84	60.0	70.7
Second Degree and above	41	29.3	100.0
Total	140	100.0	

Source: Researcher, 2020

As shown on the above table (table 4.3), the study revealed that majority (60.0%) of the respondents had first degree level of education followed by 29.3% of the respondents who had second degree and above level of education. The remaining 10.7% had diploma level of education. This shows that the respondents had sufficient levels of education to understand and respond to the issues sought by the study.

4.2.3 Work Unit of Respondents

The study sought to identify the various work units that the respondents belonged to in order to determine whether they had relevant knowledge in their area of specialization. The responses were analyzed and the results are presented in table 4.4 below:

Table 4.4: Work unit of respondents

Work Unit/Directorate	Frequency	Percent	Cumulative Percent
Quantification and Market Shaping Directorate	13	9.3	9.3
Tender Management Directorate	17	12.1	21.4
Program/Project Fund Directorate	10	7.1	28.6
Revolving Drug Fund Directorate	10	7.1	35.7
Contract Management Directorate	20	14.3	50.0
Warehouse and Inventory Management Directorate	37	26.4	76.4
Capacity Building and Operational Research Directorate	6	4.3	80.7
Distribution and Fleet Management Directorate	23	16.4	97.1
Laboratory Quality Control Directorate	4	2.9	100.0
Total	140	100.0	

Source: Researcher, 2020

As shown in table 4.4 the data displays that 26.4% of the respondents were from Warehouse and Inventory Management Directorate followed by Distribution and Fleet Management Directorate (16.4%) and Contract Management work unit (14.3%). The remaining 12.1%, 9.3%, 7.1%, 7.1%, 4.3% and 2.9% of respondents were from Tender Management, Quantification and Market Shaping, Program/Project Fund, Revolving Drug Fund, Capacity Building and Operational Research, and Laboratory Quality Control Directorates/working units respectively. This indicates that the respondents were able to understand the different logistics management practices sought by the research based on the different departments/work units they belong.

4.2.4 Work Experience of Respondents

The researcher wanted to discover out the years the respondents have been with the logistics management functions in the Agency. The responses were analyzed, and the results are presented in table 4.5 below:

Table 4.5: Work experience of respondents

Work Experience	Frequency	Percent	Cumulative Percent
2-3 years	21	15.0	15.0
4-5 years	20	14.3	14.3
6-7 years	38	27.1	27.1
Above 7 years	61	43.6	43.6
Total	140	100.0	

Source: Researcher, 2020

The data in table 4.5 shows that majority (43.6%) the respondents had work experience of above 7 years followed by 27.1% respondents' work experience ranged from 6 to 7 years. Those respondents by 14.3% had work experience of between 4 to 5 years. Only 15.0% had work experience of between 2 and 3 years as indicated in table 4.5. This shows that majority of the respondents had served for a significant period of time which infers that they were in a position to give reliable information relating to the study.

4.3 The State of Logistics Management Practices in Ethiopian Pharmaceuticals Supply Agency

The first objective of the study was to examine the statues of the logistics management practices in Ethiopian Pharmaceuticals Supply Agency. The respondents were requested to show the state of logistics management practices in Ethiopian Pharmaceuticals Supply Agency. The logistics management practices constituted of customer service practices, warehouse and inventory management practices, transportation management practices, information flow management practices and supply management practices. A five-point Likert scale with 1 = Never practiced, 2 = Rarely practiced, 3 = Occasionally practiced, 4 = Very often practiced and 5 = Always practiced was used to rate the state of logistics management practices.

Analysis of the statues of the logistics management practices was done using means and standard deviations. The means recorded were interpreted as follows: 1-1.49 = Never

practiced; 1.5-2.49 = Rarely practiced; 2.5-3.49 = Occasionally practiced; 3.5-4.49 = Very often practiced; 4.5-5.0 = Always practiced (Lady, 2016).

4.3.1 Customer Service Practices

The study wanted to determine the state of customer service practices in the Ethiopian Pharmaceuticals Supply Agency. The research findings are presented in table 4.6 below:

Table 4.6: Customer service practices

Customer service practices	N	Mean	Std. Deviation
Provide right product/pharmaceuticals and other Medical commodity/ to customers all the time	140	3.84	.752
Quick response to customer needs	140	3.70	.784
Proper customer compliant handling	140	3.61	.853
Easy and flexible customer ordering system	140	3.78	.769
Achieve minimum customer order processing cost	140	3.74	.753
Regular customer satisfaction evaluation and measurement	140	3.44	.991
Overall	140	3.6869	0.60058

Source: Researcher, 2020

As shown in table 4.6 the data indicates that an overall mean and standard deviation of (**M= 3.6869, SD= 0.60058**) were recorded indicating that customer service was very often practiced. The above table (table 4.6) demonstrates that provision of right pharmaceuticals and other medical commodities to customers all the time was very often practiced with the most highest mean (M= 3.84, SD= 0.752) coupled with easy and flexible customer ordering system (M= 3.78, SD= 0.769). Minimum customer order processing cost (M= 3.74, SD= 0.753), quick responses to customer needs (M=3.70, SD= 0.784) and Proper customer compliant handling (M= 3.61, SD= 0.853) respectively were very often practiced. Regular customer satisfaction evaluation and measurement with moderate mean (M=3.44, SD= 0.991) were occasionally carried out. The analysis further displayed that moderately high standard deviations spread from 0.752 to 0.991 which implies that respondents were more varied in their opinions to the responses given under customer service practices.

The finding about customer service practices in Ethiopian Pharmaceuticals Supply Agency (table 4.6) agrees with the literature review that was presented in the second chapter of the study. According to Bowersox et al. (2002), the primary purpose of logistics is to accommodate customer requirements in a cost- effective manner. In basic customer service

programs the concentration is mainly on the operational aspects of logistics and on ensuring that the company is capable of the seven rights to its customer. These are the right product in the right quantity and the right condition, at the right place, at the right time, for the right client at the right cost.

4.3.2 Warehouse and inventory Management Practices

The study sought to unravel the state of warehouse and inventory management practices in Ethiopian Pharmaceuticals Supply Agency. The results are shown in table 4.7 below:

Table 4.7: Warehouse and inventory management practices

Warehouse and inventory management practices	N	Mean	Std. Deviation
Proper material receipt	140	3.86	.751
Use of enterprise resource planning (ERP) system to control material transaction	140	3.23	1.294
Storage space optimization	140	3.71	.851
Accurate order picking	140	3.74	.870
Planning and optimizing warehouse layout	140	3.64	.814
Storing material according to recommended storage guide lines	140	3.77	.834
Applying warehouse safety standards	140	3.70	.903
Periodic inventory counting	140	3.90	.723
Applying demand based replenishment	140	3.82	.742
Inventory management system keeps cost at a minimum	140	3.66	.904
Automated inventory recording	140	3.67	.852
Monitoring of stock movements	140	3.92	.778
Determining of inventory levels	140	3.91	.677
Applying inventory management technique (ABC Analysis)	140	3.63	.962
Overall	140	3.7260	0.61812

Source: Researcher, 2020

As shown in table 4.7, the mean and standard deviation scores for the overall perception of respondents towards warehouse and inventory management practices was (**M=3.7260, SD= 0.61812**). This demonstrates that the warehouse and inventory management was very often practiced in Ethiopian Pharmaceuticals Supply Agency. As presented in the table, the statement that monitoring of stock movements was the most highly rated with mean of (M= 3.92, SD= 0.778) indicating that it was very often practiced in combination with

determination of inventory levels (M= 3.91, SD= 0.677). Periodic inventory counting (M= 3.90, SD= 0.723), proper material receipt (M= 3.86, SD= 0.751), applying demand based replenishment (M= 3.82, SD= 0.742) and storing material according to recommended storage guide lines (M= 3.77, SD= 0.834) were very often practiced. Accurate order picking (M= 3.74, SD= 0.870), storage space optimization (M= 3.71, SD= 0.851), applying warehouse safety standards (M= 3.70, SD= 0.903) and automated inventory recording (M= 3.67, SD= 0.852) were also very often practiced. Further, inventory management system keeps cost at a minimum (M= 3.66, SD= 0.904), planning and optimizing warehouse layout (M= 3.64, SD= 0.814) and applying inventory management technique (ABC Analysis) (M= 3.63, SD= 0.962) were very often practiced. The least rated statement was use of enterprise resource planning (ERP) system to control material transaction with mean and standard deviation of (M=3.23, SD= 1.294) showing it was occasionally practiced. The analysis exhibited that a relatively high standard deviation spread ranging from 0.677 to 1.294 signifying that respondents were more varied in their opinion to the responses given under warehouse and inventory management practices.

The findings in the above table agree with the literature review that was conducted in the second chapter of the study. According to Bagshaw (2017), shipping delays, processing errors and more complication that could negatively impact on the rate of customer satisfaction could be seen due to inefficient warehouse management practices.

4.3.3 Transport Management Practices

The study attempted to establish the state of transport management practices in Ethiopian Pharmaceuticals Supply Agency. The outcomes were analyzed as shown in table 4.8 below:

Table 4.8: Transportation management practices

Transport management practices	N	Mean	Std. Deviation
Applying fleet control system	140	3.67	1.014
Vehicle scheduling	140	3.71	.852
Vehicle route planning	140	3.81	.847
Vehicle inspection schedule	140	3.51	1.007
Vehicles tracking system	140	3.69	1.039
Vehicle load planning	140	3.59	.944
Timely material delivery	140	3.71	.924
Overall	140	3.6694	0.76214

Source: Researcher, 2020

When we evaluate the overall perception of respondents towards transport management practices, the aggregate mean and standard deviation scores show (**M = 3.6694, SD = 0.76214**) demonstrated that transportation management was very often practiced. As can be observed in the above table (table 4.8), vehicle route planning was very often practiced with highest mean (M= 3.81, SD= 0.847). Furthermore, vehicle scheduling and timely material delivery were very often practiced with mean of (M= 3.71, SD= 0.852) and (M= 3.71, SD= 0.924) respectively. As observed in the above table, vehicle tracking system (M= 3.69, SD= 1.039), applying fleet control system (M= 3.67, SD= 1.014), vehicle load planning (M= 3.59, SD= 0.944) and vehicle inspection schedule (M= 3.51, SD= 1.007) were very often practiced. The analysis moreover showed that a high standard deviation range from 0.847 to 1.039 which indicates that respondents were a little more varied in their views to the responses given under transport management practices.

The findings in the above table (table 4.8) agree with the literature review that was conducted. According to Reddy and Jayam (2016), by moving goods from locations where they are sourced to locations where they are demanded, transportation provides the essential service of connecting an organization to its suppliers and clients.

4.3.4 Information Flow Management Practices

The study tried to establish the state of Information flow management practices in Ethiopian Pharmaceuticals Supply Agency. The responses from respondents were presented in table 4.9 below:

Table 4.9: Information flow management practices

Information flow management practices	N	Mean	Std. Deviation
Smooth information flow to all logistics functions	140	3.43	.849
Adequate information flow in the logistics process	140	3.46	.851
Reliable information flow in the logistics process	140	3.46	.852
Information flow coordinates the logistics activities	140	3.53	.860
Information flow communicates the logistics activities	140	3.61	.819
Information flow uses to plan the logistics activities	140	3.55	.808
Overall	140	3.5071	0.68321

Source: Researcher, 2020

As shown in the above table an overall mean and standard deviation of (**M=3.5071, SD= 0.68321**) was recorded indicating that information flow management was very often

practiced. As revealed in the table information flow communicates the logistics activities was very often practiced with relatively highest mean ($M= 3.61$, $SD= 0.819$) followed by information flow uses to plan the logistics activities and. information flow coordinates the logistics activities were very often practiced with mean of ($M= 3.55$, $SD= 0.808$) and ($M= 3.53$, $SD= 0.860$) respectively. The least rated statement were adequate information flow in the logistics process ($M=3.46$, $SD= 0.851$), reliable information flow in the logistics process ($M= 3.46$, $SD= 0.852$) and smooth information flow to all logistics functions ($M= 3.43$, $SD= 0.849$) were occasionally practiced respectively. The analysis also showed that a little bit high standard deviation spread ranging from 0.808 to 0.860 signifying that respondents were less varied in their opinion to the responses given under information flow management practices.

The finding about information flow management practice in Ethiopian Pharmaceuticals Supply Agency (table 4.9) agrees with the literature review that was presented in the second chapter of the study. According to Grunt and Nowakowska (2006), the flow of information in a smoothly and quickly manner provides managers with comprehensive knowledge could be led to effective logistics management in the organization. Investing on and applying computers, internet and information communication systems can be viewed in virtually all undertakings in the logistics business. These activities of logistics are transportation, warehousing, order processing, materials management and procurement. It can help businesses to accomplish competitive advantages by providing consumers with superior services.

4.3.5 Supply Management Practices

The study tried to determine the state of supply management practices in Ethiopian Pharmaceuticals Supply Agency. The responses from respondents were presented in table 4.10 below:

Table 4.10: Supply management practices

Supply management practices	N	Mean	Std. Deviation
Appropriate need identification	140	3.69	.813
Effective purchase order processing	140	3.78	.840
Automated Supplier catalogue	140	3.40	1.065
Exercising win-win negotiation with suppliers	140	3.66	.880
Creating strategic relationships with suppliers	140	3.56	.947
Regular supplier performance evaluation	140	3.54	.970
Electronic exchange of information with suppliers	140	3.44	1.027
Overall	140	3.5816	0.73678

Source: Researcher, 2020

When we evaluate the overall perception of respondents towards supply management practices, the aggregate mean and standard deviation scores (**M = 3.5816, SD = 0.73678**) show that supply management was very often practiced. As can be observed in the above table effective purchase order processing was very often practiced with highest mean (M= 3.78, SD= 0.840) followed by appropriate need identification with mean of (M= 3.69, SD= 0.813). As shown in the above table exercising win-win negotiation with suppliers (M= 3.66, SD= 0.880), creating strategic relationships with suppliers (M= 3.56, SD= 0.947) and regular supplier performance evaluation (M= 3.54, SD= 0.970) were very often practiced. The least rated factors were electronic exchange of information with suppliers (M=3.44, SD= 1.027) and automated Supplier catalogue (M= 3.40, SD= 1.065) which were occasionally practiced respectively. The analysis also showed a relatively a high standard deviation spread ranging from 0.813 to 1.065 which indicates that respondents were more varied in their opinion to the responses given under supply management practices.

The finding from the above table agrees with the literature review showed in the second chapter of the study. According to Rushton (2010), purchasing and supply, also known as procurement, are amongst the key links in the supply chain and as such can have a considerable influence on the overall achievement of the business.

4.4 Ethiopian Pharmaceuticals Supply Agency Organizational Performance

In this section of data analysis, the study sought to identify the extent to which logistics management practice contribute to the organizational performance of Ethiopian Pharmaceuticals Supply Agency. Different parameters were used to measure organizational performance. Analysis of the logistics management practices and organizational performance of the Ethiopian Pharmaceuticals Supply Agency was done using means and standard deviations. The means recorded were interpreted as follows: 1-1.49 = Not at all; 1.5-2.49 = Small extent; 2.5-3.49 = Moderate extent; 3.5-4.49 = Great extent; 4.5-5.0 =Very great extent.

Table 4.11: Logistics management practice and organizational performance of Ethiopian Pharmaceuticals Supply Agency

Performance parameter	N	Mean	Std. Deviation
Ethiopian Pharmaceuticals Supply Agency has increased customer satisfaction by applying logistics management practices	140	3.64	.906
Logistics management practices have led to the growth of Ethiopian Pharmaceuticals Supply Agency market share	140	3.76	.905
Through the implementation of logistics management practices Ethiopian Pharmaceuticals Supply Agency has grown its sales	140	3.74	.851
Through the implementation of logistics management practices Ethiopian Pharmaceuticals Supply Agency has increased percentage of its pharmaceuticals/commodity availability	140	3.78	.874
Through the implementation of logistics management practices Ethiopian Pharmaceuticals Supply Agency has increased its profit	140	3.74	.957
Competitive position of Ethiopian Pharmaceuticals Supply Agency has increased due to implementation of logistics management practices	140	3.73	.920
Overall	140	3.7310	0.71849

Source: Researcher, 2020

As shown in the above table (table 4.11), an overall mean and standard deviation of (**M=3.7310, SD= 0.71849**) was recorded indicating that logistics management practices

significantly contributed to the Ethiopian Pharmaceuticals Supply Agency performance. As evidenced from the table, the statement that through the implementation of logistics management practices Ethiopian Pharmaceuticals Supply Agency has increased percentage of its pharmaceuticals/commodity availability. This is shown by the ratings with a mean and standard deviation of ($M= 3.78$, $SD= 0.874$). Following this is logistics management practices which led to the growth of Ethiopian Pharmaceuticals Supply Agency market share ($M= 3.76$, $SD= 0.905$). Through the implementation of logistics management practices Ethiopian Pharmaceuticals Supply Agency has greatly increased its sales with mean of ($M= 3.74$, $SD= 0.851$). The study further revealed that, through the implementation of logistics management practices Ethiopian Pharmaceuticals Supply Agency has increased its profit. The competitive position of the Agency has also improved due to implementation of logistics management practices. The resulting outcomes that the Agency has increased customer satisfaction to a great. The mean values for the three logistics practices as ($M= 3.74$, $SD= 0.957$), ($M= 3.73$, $SD= 0.920$) and ($M= 3.64$, $SD= 0.906$) respectively. The analysis also indicated that a little bit high standard deviation range from 0,851 to 0.957 which infers that respondents were less varied in their opinion to the responses given regarding the extent of logistics management practices contribution to organizational performance of the Agency.

The findings in the above table (table 4.11) agree with the study of Thogori and Gathenya (2016) who concluded that, factors of logistics activities and critical factors affecting those logistics activities are important element for business performance. The study done by Olavarrieta and Ellinger (1997) concluded that focusing on the enhancement of logistics capabilities is associated with superior firm performance.

4.5 Relationship between Logistics Management Practices and Ethiopian Pharmaceuticals Supply Agency Organizational Performance

In this section of the study efforts were made to identify the relationship between logistics management practices and organizational performance in Ethiopian Pharmaceuticals Supply Agency.

As mentioned in chapter one of this study, the second objective of the study was to examine the relationship between logistics management practices and organizational performance in Ethiopian Pharmaceuticals Supply Agency. Inferential statistical analysis, correlation and multiple linear regression analysis were used to examine the relationship between the independent variable (logistics management practices) and dependent variable (organizational

performance).

4.5.1 Correlation Analysis

The Pearson's Product Moment Correlation Coefficient was computed to determine the relationships between the practices of customer services, warehouse and inventory management, transport management, information flow management and supply management and organizational performance of the Agency. The strength of correlation can be described using Evans (1996) guide. "Evans (1996) suggests that the absolute value of linear correlation coefficient (r)", as cited in (Beldjazia and Alatou, 2016). "If

$r = 0.00-0.19$ it will be very weak

$r = 0.20-0.39$ it will be weak

$r = 0.40-0.59$ it will be moderate

$r = 0.60-0.79$ it will be strong and

$r = 0.80-1.0$ –it will be very strong".

Pearson correlation coefficients were determined with the objective of obtaining information about the relationships between the dependent and independent variables as presented in table 4.12 below:

Table 12: Correlation coefficients between dependent and independent variables

		Organizational Performance	Customer service practices	Warehouse & inventory management Practices	Transport management practices	Information flow management practices	Supply management Practices
Organizational Performance	Pearson Correlation	1					
	Sig. (2- tailed)						
	N	140					
Customer service practices	Pearson Correlation	0.795**	1				
	Sig. (2- tailed)	.000					
	N	140	140				
Warehouse & inventory management Practices	Pearson Correlation	0.806**	0.799**	1			
	Sig. (2- tailed)	.000	.000				
	N	140	140	140			
Transport management Practices	Pearson Correlation	0.771**	0.728**	0.742**	1		
	Sig. (2- tailed)	.000	.000	.000			
	N	140	140	140	140		
Information flow management practices	Pearson Correlation	0.738**	0.680**	0.652**	0.641**	1	
	Sig. (2- tailed)	.000	.000	.000	.000		
	N	140	140	140	140	140	
Supply management practices	Pearson Correlation	0.817**	0.795**	0.820**	0.725**	0.716**	1
	Sig. (2- tailed)	.000	.000	.000	.000	.000	
	N	140	140	140	140	140	140
**. These two stars indicate that correlation is significant at the 0.01 level (2-tailed).							

Source: Researcher, 2020

From the above 4.12 correlation table, we can realize that most of the independent constructed variables were correlated with organizational performance of Ethiopian Pharmaceuticals Supply Agency. The results indicated that there is a positive and significant correlation between customer service practice and organizational performance ($r=0.795$, $p<0.01$). According to Evans's (1996) magnitude of correlation, the relationship between the two variables is strong. In addition, the result showed that warehouse and inventory management practice is positively and significantly correlated with organizational performance ($r=0.806$, $p<0.01$). Thus, the relationship between the two variables is very strong.

According to the results, strong and statistically significant positive correlation is found between transport management practice and organizational performance with ($r=0.771$, $p<0.01$). Furthermore, as shown in the above table, positive and significant correlation could be observed between information flow management practice and organizational performance at ($r=0.738$, $p<0.01$), which infer that strong relation exists between the two variables. From the results, the correlation between supply management practice and organizational performance is positive and significant relations at ($r=0.817$, $p<0.01$) according to the correlation magnitude of Evans (1996). Thus, all the constructs under consideration are significantly correlated.

Generally, the correlation analysis exhibited that there is a positive and statistically significant relationship between logistics management practices and organizational performance of Ethiopian Pharmaceuticals Supply Agency. As per the Hand Book of logistics and distribution management, these findings are consistent that whatever improvement is done in respect of logistics will help to enhance business performance in terms of increased revenue generation in a very cost effective way.

4.5.2 Regression Analysis

A multiple regression analysis was carried out to determine the influence of independent variables on the dependent variable. A Multiple regression also used to determine the overall fit (variance explained) of the model and the relative contribution of each of the predictors to the total variance explained. In this section, multiple regression analysis has been applied to determine if there is a statistically significant relation between organizational performance and the logistics management practices or not. Moreover, it enabled to develop a formula that shows the relation between the dependent variable (organizational performance) and the

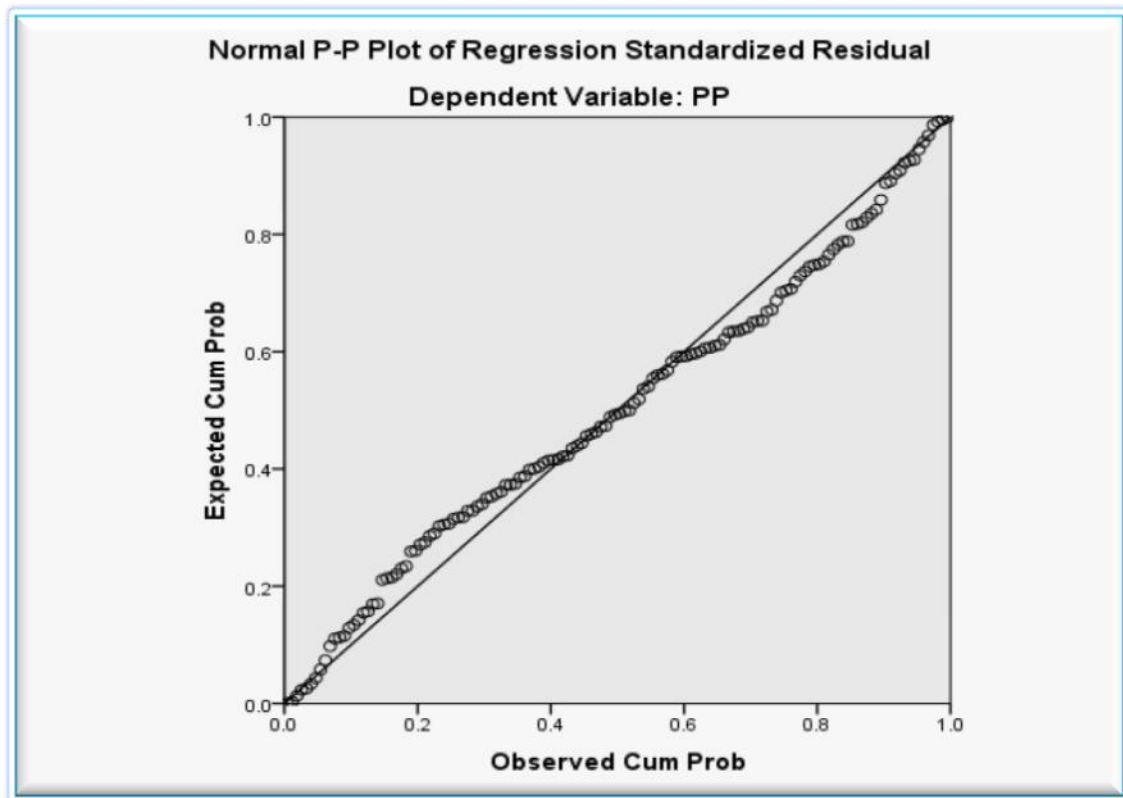
independent variables (logistics management practices). This part of analysis includes a regression model to test the hypothesis. Statements of hypothesis were formulated based on the five variables (five logistics practices) used in this study in order to come up with the results. For all the hypotheses of the study below 95% confidence interval was used.

According to Ballance (2004), the correct use of a multiple regression model requires that a number of critical assumptions be satisfied in order to apply the model and establish validity. To ensure that the regression results are reliable and unbiased, the assumptions underlying a regression analysis are examined. Inferences and generalizations about the theory are valid only if the assumptions in analysis have been tested and proven reliable.

Before carrying out multiple regression analysis, the researcher has checked the compulsory assumptions that the data must meet to make the analysis reliable and valid. The following assumptions of a multiple linear regression were tested using SPSS version of 24 software program.

1. *Linearity assumption:* Linearity defines the dependent variable as a linear function of the (independent variable) predictor (Balance, 2004). Moreover, linearity refers to the degree to which the change in the dependent variable is related to the change in the independent variables. Linearity assumption was tested by producing Normal Probability Plots of the relationship between each of independent variable (logistics management practices) and the dependent variable (organizational performance) of the Agency. In a normal probability plot of the regression, standardized results lie in a regularly straight diagonal line from bottom left to top right in the figure 4.1 below:

Figure 4. 1: Linearity Test



Source: Researcher, 2020 (SPSS output)

By visually looking at the Normal Probability plot produced by Statistical Package for Social Science (SPSS), it could be concluded that the relationship between each independent variable and the dependent variable is found to be linear as shown in figure 4.1 above.

2. Multi-collinearity assumption: Linear regression assumes that there is little or no multi-collinearity in the data. Before presenting the regression models, it should be inspected for none existence of excessive correlations between the independent variables in the model. When there is a perfect or exact (it means if $r=1$ between independent variables) relationship between the predictor variables or at least one independent variable with a combination of other independent variables, it will result in incorrect conclusions about the relationship between dependent variable and predictor variables (Alibuhtto and Peiris, 2015). Sometimes, it will be difficult to identify the individual contribution of each variable in predicting the outcomes of the dependent variable, when independent variables are highly correlated. Collinearity diagnostics can help the researcher to pick up on problems with multi-collinearity that may not be evident in the correlation matrix.

According to Reddy et al. (2013) the most widely applicable method of detecting the multi-collinearity is Variance Inflation Factor (VIF) and as a rule of thumb, Variation Inflation Factor (VIF) values exceed 5 or 10 suggests problems with multi-collinearity (Reddy et al. 2013). The VIF (Variance Inflation Factor) is defined as $VIF = 1/\text{Tolerance}$. Moreover, Field (2009), also underlined that, values for Tolerance below 0.1 indicate serious problems, although several statisticians suggested that value below 0.2 indicates that the multiple correlation with other independent variables is high, which suggests the possibility of multi-collinearity (Field 2009).

Table 4.13: Multi-collinearity Test Result

Coefficients ^a			
Model	Independent variables	Collinearity Statistics	
		Tolerance	Variance Inflation Factor (VIF)
1	Customer service practice	0.275	3.637
	Warehouse and inventory management practice	0.251	3.990
	Transport management practice	0.373	2.681
	Information flow management practice	0.440	2.275
	Supply management practice	0.241	4.154

a. Dependent Variable: Organizational Performance

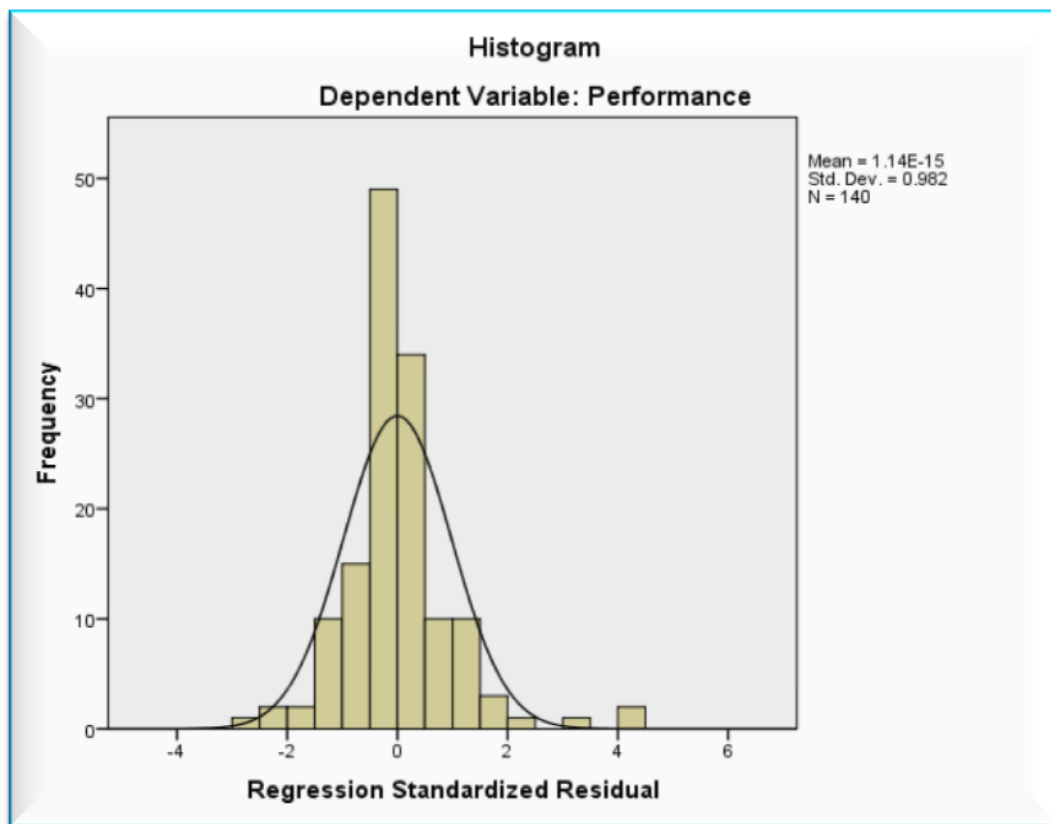
Source: Researcher, 2020 (SPSS output)

As it can be observed in the multi-collinearity test table (table 4.13), multi-collinearity is not the problem of multiple linear regression model, because Variance Inflation Factor (VIF) of the model is less than 5.0 and the Tolerance is not less than 0.20. The value of VIF ranges between 2.275 to 4.154 and the tolerance of the variables ranges between 0.241 and 0.440. Therefore, the independent (predictors) variables are not overlapped or highly related. They are free from multi-collinearity problems which possibly hinders the prediction ability of the multiple linear regressions model.

3. Normality assumption: Normality is used to describe a symmetrical, bell-shaped curve, which has the greatest frequency of scores in the middle combined with smaller frequencies towards the extremes. A multiple regression assumes that variables have normal distributions. This means that errors are normally distributed and the values of the residuals will

approximate a normal curve. The common method to check normality assumption is a histogram (with a superimposed normal curve).

Figure 4. 2: Normality Test

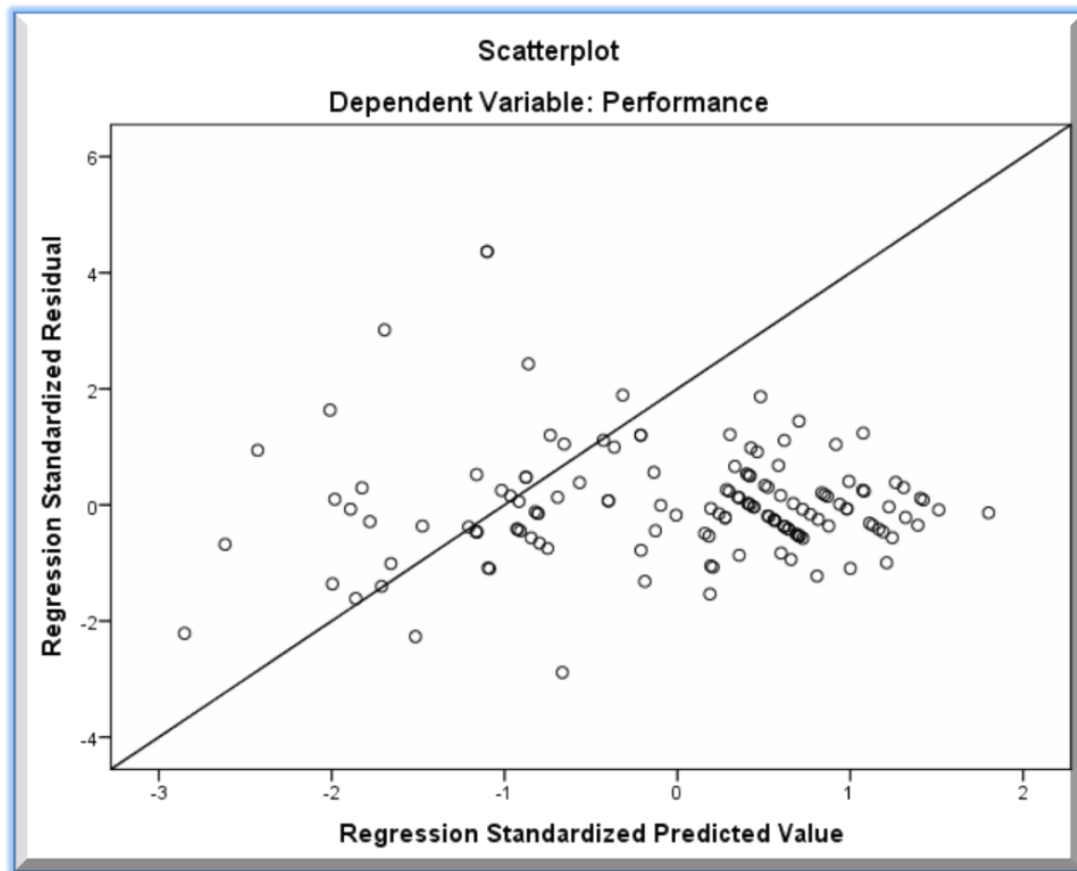


Source: Researcher, 2020 (SPSS output)

As it can be observed in the above figure (figure 4.2) it indicates that the requirement is satisfied and there is no major deviation from normality. In simple words normality test for the data used in this study shown by the above histogram indicates that error terms are normally distributed. Therefore, it can be concluded that normality is guaranteed as the histogram generated is normally distributed.

4. Homoscedasticity assumption: The assumption of homoscedasticity refers to equal variance of errors across all levels of the independent variables. This means that errors are spread out consistently between the variables. Homoscedasticity can be checked by visual examination of a plot of the standardized residuals by the regression standardized predicted value. Heteroscedasticity is indicated when the scatter is not even; fan and butterfly shapes are common patterns of violation. Accordingly, the researcher created a scatterplot of standardized residuals versus standardized predicted values using SPSS software program.

Figure 4. 3: Homoscedasticity Test



Source: Researcher, 2020 (SPSS output)

As shown in figure 4.3 the standardized residuals in this research are distributed evenly and is concluded that heteroscedasticity is not a serious problem for this data.

5. Autocorrelation Test: It occurs when the residuals are not independent from each other. A multiple linear regression analysis requires that there is little or no autocorrelation in the data. If the covariance between the error terms over time is zero there is no autocorrelation between residuals. It can be checked autocorrelation with the Durbin-Watson test. In SPSS software program under regression analysis there is Durbin-Watson option and it can be use it to get its calculated result. Therefore, the researcher used Durbin-Watson test to check autocorrelation. The value of Durbin Watson assumes to be between 0 and 4; values around 2 indicate no autocorrelation.

- The "R" column represents the value of R, a multiple correlation coefficient which shows that the degree of associations between variables (independent and dependent).
- The "F" column represents the value of F-Ratio which shows that weather the overall regression model is a good fit for the data.

- The “DF “ column represents the value of the degrees of freedom (DF) which indicates the number of independent values that can vary in an analysis without breaking any constraints. It is an essential idea that appears in many contexts throughout statistics including hypothesis tests, probability distributions and regression analysis
- The “Sig. F” column represents the value of Sig. F, statistically significance value ($P < 0.05$ which shows that statistically significant relationships between the two variables (power of prediction between independent variables on dependent variables).

Table 4.14: Autocorrelation Test

Model Summary ^b										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df 1	df2	Sig. F Change	
1	.888^a	.788	.780	.33708	.788	99.501	5	134	.000	1.983
a. Predictors: (Constant), Supply Management practice, Information Flow Management practice, Transport Management Practice, Customer Service Practice, Warehouse and Inventory Management Practice										
b. Dependent Variable: Organizational Performance										

Source: Researcher, 2020 (SPSS output)

As it can be observed in table 4.14 the Durbin-Watson test by SPSS calculated it as **1.983**. The value of Durbin-Watson test of this research lies between $0 < 1.983 < 4$ and is close to 2. Therefore, there is no violation of Autocorrelation.

From an explanation of the information presented in the entire five tests one can conclude that there are no significant data problems that could lead to the conclusion that the assumptions of multiple regressions have been seriously violated. Consequently, multiple regression analysis was carried out to determine the following:

- (A) The degree to which the regression model fits the data (Model Summary),
- (B) Independent variables significantly predict the dependent variable (ANOVA) and
- (C) Statistical significance of each of the independent variables (Regression Coefficients).

A. Model Summary

The study efforts were made to determine the relationship between logistics management practices and organizational performance in the Agency. The outputs produced by SPSS software program were presented in table 4.15 below:

Table 4.15: Model summary

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.888 ^a	.788	.780	.33708	1.983
a. Predictors: (Constant), Supply Management practice, Information Flow Management practice, Transport Management Practice, Customer Service Practice, Warehouse and Inventory Management Practice					
b. Dependent Variable: Organizational Performance					

Source: Researcher, 2020 (SPSS output)

As shown in the model summary table (table 4.15), the "R" column represents the value of R, the multiple correlation coefficient. R value of 0.888 indicates very strong correlation between organizational performance and the five independent variables and that shows a good level of prediction. The "R Square" column denotes the R^2 value, known as the coefficient of determination, which is the proportion of variance in the dependent variable that can be explained by the independent variables. As presented in the table above, R^2 value of 0.788 indicates that 78.8% of the variance in the model could be predicted using the independent variables or in simple words 78.8% of the variation in the organizational performance of the Agency can be explained by the logistics management practices (independent variables included in the model). However, the remaining 21.2% changes in organizational performance in Ethiopian Pharmaceuticals Supply Agency (EPSA) are caused by other factors that are not included in the model. Therefore, the five logistics management practices of the Agency (customer service, warehouse and inventory management, transport management, information flow management and supply management practices) are good explanatory variables to predicting organizational performance of the Agency.

B. ANOVA Model Fit

The F-ratio in the ANOVA table below tests whether the overall regression model has been a good fit for the data. To be statistically significance, the value of Sig. is less than 5% ($P < 0.05$). The outputs produced by SPSS software program were presented in table 4.16 below:

Table 4.16: ANOVA model fit

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	56.529	5	11.306	99.501	.000 ^b
	Residual	15.226	134	.114		
	Total	71.755	139			
a. Dependent Variable: Organizational Performance						
b. Predictors: (Constant), Supply Management practice, Information Flow Management practice, Transport Management Practice, Customer Service Practice, Warehouse and Inventory Management Practice						

Source: Researcher, 2020 (SPSS output)

The table shows that Sig. value 0.05 is greater than the calculated sig. value of 0.000. This shows that statistically significant relationships exist between the two variables. In other words this indicates that the independent variables statistically significantly predict the dependent variable. $F = 99.501$, calculated sig. value of $0.000 < \text{sig. value } 0.05$ ($p < 0.001$). Therefore, the regression model is a good fit of the data at 5 percent level of significance.

C. Regression Coefficients

The study tried to determine the statistical significance of each of the independent variables in the Agency. The outputs produced by SPSS software program were presented in table 4.17 below:

Table 4.17: Regression coefficients

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t-value	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.126	.192		-.657	.513
	Customer service practice	.201	.091	.168	2.209	.029
	Warehouse and inventory management practice	.239	.092	.206	2.590	.011
	Transport management practice	.197	.061	.209	3.205	.002
	Information flow management practice	.206	.063	.196	3.268	.001
	Supply management practice	.218	.079	.223	2.755	.007
a. Dependent Variable: Organizational Performance						

Source: Researcher, 2020 (SPSS output)

Standardized Coefficient (Beta)

The standardized coefficients are useful to know which of the different independent variables is more important. They are used in comparison of impact of any independent variable on the dependent variable. As indicated in the regression coefficients table (table 4.17), supply management practice had the highest standardized coefficient (0.223) followed by transport management practice (0.209). This explains that supply management practice has higher relative effect on organizational performance. Warehouse and inventory management practice, information flow management and customer service practice ranked from three to five respectively in their relative importance on organizational performance.

As it can be realized from the regression coefficient table 4.17, the predictor variables of supply management practices, transport management practices, warehouse and inventory management practices, information flow management practices and customer service practices of the agency are statistically significant in predicting organizational performance of the Agency. This is because all their sig. values (p-values) are less than alpha level of 0.05. The literatures reviewed showed in the second chapter of the study that supply management practices, transport management practices, warehouse and inventory management practices, information flow management practices and customer service practices were important factors of logistics management practices in determining organizational performance. The outcome of the regression coefficient in table 4.17 proved this.

Unstandardized Coefficients

The coefficients of the independent variables in the regression coefficient outputs are denoted by unstandardized coefficients β . The change in the dependent variable with a unit changes in the independent variable showed by the unstandardized coefficient (B).

As stated in chapter three, the study used the following multiple regression model to establish the statistical significance of the independent variables on the dependent variable.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon$$

Where; Y = Organizational performance

X1 = Customer service practices

X2 = Warehouse and inventory management practices

X3 = Transportation management practices

X4 = Information flow management practices

X5 = Supply management practices

X1- X5 are the explanatory variables and the error term ϵ (the Greek letter epsilon) is a random variable.

In the model ($Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon$), β_0 = Constant, β_1 to β_5 = Regression coefficients represent the mean change in the dependent variable for one unit of change in the independent variable while holding other independent variables in the model constant and ϵ Error term which captures the unexplained variation in the model.

The Unstandardized coefficients β of the independent variables were substituted in the model ($Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon$). It could be formulated the model as shown below:

$$Y = -0.126 + 0.201X_1 + 0.239X_2 + 0.197X_3 + 0.206X_4 + 0.218X_5 + \epsilon$$

From the above model formula the constant value ($\beta_0 = -0.126$) implies that organizational performance of Ethiopian Pharmaceuticals Supply Agency would be -0.126 if other variables of the model were zero. Similarly, a beta coefficient (β) of 0.239 indicates that a unit changes in warehouse and inventory management practice leads to a change in the organizational performance of Ethiopian Pharmaceuticals Supply Agency by 0.239 followed by a beta coefficient of 0.218 shows that a unit changes in supply management practice leads to a change in the organizational performance of the agency by 0.218. Moreover, a beta coefficient of 0.206 indicates that a unit changes in information flow management practice leads to a change in the organizational performance of the agency by 0.206. As shown from the above regression model formula, a beta coefficient of 0.201 displays that a unit changes in customer service practice leads to a change in the organizational performance of the Agency by 0.201. Accordingly, a beta coefficient of 0.197 signifies that a unit changes in transport management practice leads to a change in the organizational performance of the Agency by 0.197. In addition, in the above regression model formula the error term (ϵ) estimate was assumed to be zero.

Regression coefficient results show that all five independent variables are statistically significant in predicting the organizational performance of Ethiopian Pharmaceuticals Supply Agency. The statistically significant variables are customer service practices, warehouse and

inventory management practices, transport management practices, information flow management practices and supply management practices as evidenced by their P-values ($P < 0.05$). This indicates that an increase in these variables results in an increase in the organizational performance of the agency.

These findings provide significant support for the reliability, transaction efficiency and literature which advocates that the variables have an effect upon organizational performance in Ethiopian Pharmaceuticals Supply Agency.

4.5.3 Hypothesis Testing

Based on the above regression analyses result the hypothesis of the study are tested and presented as follows:

I. Customer Service Practices

Hypothesis 1: Customer service practice has significant and positive effect on organizational performance.

Based on the above coefficient of regression table (table 4.17), the results in the table show that customer service practice has a beta coefficient (unstandardized β coefficient) of 0.201 and p-value of 0.029. Holding other explanatory variables constant customer service practice was found to have a statistically significant positive effect on organizational performance of Ethiopian Pharmaceuticals Supply Agency. Thus, the researcher has rejected the null hypothesis and accepted the alternate one (Hypothesis 1) that stated customer service practice has significant and positive effect on organizational performance. This finding is consistent with the literature review.

II. Warehouse and Inventory Management Practices

Hypothesis 2: Warehouse and inventory management practice has significant and positive effect on organizational performance.

With regard to warehouse and inventory management practice statistically significant and positive effect was observed between warehouse and inventory management practice and organizational performance as hypothesized. Warehouse and inventory management practice has a beta coefficient (unstandardized β coefficient) of 0.239 and p value of 0.011 (i.e., $p < 5\%$). Therefore, the alternate hypothesis (Hypothesis 2) that stated that warehouse and inventory management practice has significant and positive effect on organizational

performance of the Agency was accepted while rejecting the null hypothesis. This finding is consistent with the literature review.

III. Transport Management Practices

Hypothesis 3: Transport management practice has significant and positive effect on organizational performance.

As it can be realized from the regression coefficient table (table 4.17), transport management practice has a beta coefficient (unstandardized β coefficient) of 0.197 and p-value of 0.002. Holding other explanatory variables in the model constant transport management practice was found to have a statistically significant positive effect on organizational performance of the Agency. Therefore, the researcher has accepted the alternate hypothesis (Hypothesis 3) that stated that transport management practice has significant and positive effect on organizational performance of the agency while rejecting null hypothesis. The expected positive coefficient estimates of transport management practices are consistent with the literature review.

IV. Information Flow Management Practices

Hypothesis 4: Information flow management practice has significant and positive effect on organizational performance.

In relation to information flow management practice statistically significant and positive effect was similarly observed between information flow management practice and organizational performance as assumed. Information flow management practice has a beta coefficient (unstandardized β coefficient) of 0.206 and p-value of 0.001. Therefore, the alternate hypothesis (Hypothesis 4) that stated that information flow management practice has significant and positive effect on organizational performance of the Agency was accepted while rejecting the null hypothesis. This finding is consistent with the literature review.

V. Supply Management Practices

Hypothesis 5: Supply management practice has significant and positive effect on organizational Performance.

Based on the above coefficient of regression table (table 4.17), the results in the table show that supply management practice has a beta coefficient (unstandardized β coefficient) of 0.218 and p-value of 0.007 (i.e., $p < 5\%$). Holding other explanatory variables constant supply

management practice was found to have a statistically significant positive effect on organizational performance of Ethiopian Pharmaceuticals Supply Agency. Thus, the researcher has rejected the null hypothesis and accepted the alternate one (Hypothesis 5) that stated that supply management practice has significant and positive effect on organizational performance. This finding is supported by the literature review.

Table 4.18: Summary of Hypothesis Testing Result

Hypothesis	Result
H1: Customer service practice has significant and positive effect on organizational performance	Accepted/hypothesis supported
H2: Warehouse and inventory management practice has significant and positive effect on organizational performance.	Accepted/hypothesis supported
H3: Transport management practice has significant and positive effect on organizational performance.	Accepted/hypothesis supported
H4: Information flow management practice has significant and positive effect on organizational performance.	Accepted/hypothesis supported
H5: Supply management practice has significant and positive effect on organizational Performance.	Accepted/hypothesis supported

Source: Researcher, 2020

In conclusion, based on the above analysis the researcher concluded that customer service, warehouse and inventory management, transport management, information flow management and supply management practices have the highest positive and significant impact on organizational performance. Thus, logistics management practices have significant and positive effect on organizational performance of Ethiopian Pharmaceuticals Supply Agency.

4.6 Challenges of Logistics Management Practices in Ethiopian Pharmaceuticals Supply Agency (EPSA)

The third objective of the study was to determine the challenges of logistics management practices in Ethiopian Pharmaceuticals Supply Agency. The respondents were requested to share their experiences of the extent to which the different challenge parameters affect organizational performance of the Agency. Analysis of the challenges of logistics

management practices in the Ethiopian Pharmaceuticals Supply Agency was done using means and standard deviations. The means recorded were interpreted as follows: 1-1.49 = Not at all; 1.5-2.49 = Small extent; 2.5-3.49 = Moderate extent; 3.5-4.49 = Great extent; 4.5-5.0 = Very great extent.

Table 4.19: Challenges of logistics management practices in Ethiopian Pharmaceuticals Supply Agency

Challenges of logistics management practices	N	Mean	Std. Deviation
Shortage of logistics infrastructure	140	3.34	.972
Increasing logistics costs	140	3.56	.816
Poor exchange of information	140	3.59	.936
Insufficient logistics management capacity	140	3.53	.852
Lack of integrated system	140	3.59	.974
Lack of modern management techniques	140	3.61	.911
Inability to access and apply the growing logistics knowledge base	140	3.50	.902
Foreign currency shortage	140	3.86	.979
Lack of collecting receivables	140	3.64	.915
Lack of accuracy of quantification/forecasting	140	3.61	.879
Overall	140	3.5807	0.49746

Source: Researcher, 2020 (SPSS output)

As indicated in the above table (table 4.19), the study has shown that Ethiopian Pharmaceuticals Supply Agency faced logistics management challenges that affected its organizational performance to a great extent as shown by the overall mean of (**M=3.5807, SD= 0.49746**). As the study proved, foreign currency shortage was the most critical challenge with the mean value (M=3.86, SD= 0.979) followed by lack of collecting receivables with mean of (M=3.64, SD= 0.915). Lack of accuracy of quantification/forecasting, lack of modern management techniques, poor exchange of information, lack of integrated system, increasing logistics cost, insufficient logistics management capacity, and inability to access and apply the growing logistics knowledge base were the other most experienced challenges. The values of the plugging challenges are (M=3.61, SD= 0.879), (M=3.61, SD= 0.911), (M=3.59, SD= 0.936), (M=3.59, SD= 0.974), (M=3.56, SD= 0.816), (M=3.53, SD= 0.852) and (M=3.50, SD= 0.902) respectively. Relatively, the low rated challenge was shortage of logistics infrastructure with a mean value of (M=3.34, SD= 0.972) showing that it has been a moderate challenge.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5 Introduction

The study was intended to investigate the relationship between logistics management practices and organizational performance of Ethiopian Pharmaceuticals Supply Agency. This chapter presents the summary of key data findings with respect to the objectives of the study with conclusions drawn from the findings and makes appropriate recommendations. Accordingly, the conclusions and recommendations drawn focused on addressing the three objectives of the study: which were to determine the statues of the logistics management practices in the Agency, establish the relationship between logistics management practices and organizational performance in Ethiopian Pharmaceuticals Supply Agency and to determine the challenges of logistics management practices in the Agency. Furthermore, this chapter provides limitations and suggestions for future research.

5.1 Summary of Findings

In this study efforts were made to cover the relationships of logistics management practices and organizational performance in Ethiopian Pharmaceuticals Supply Agency (EPSA). The study was also an attempt to determine the statues of the practices of customer service, warehouse and inventory management, transportation management, information flow management and supply management. Furthermore, efforts were made to determine the challenges of logistics management practices in the Agency. The study tried to explore important concepts in relation to the research objectives in consideration. That included review of related literatures regarding theories of supply chain management and logistics, logistics cycle, logistics management practices, measurement of logistics management and organizational performance, challenges of logistics management and empirical literature reviews manifesting actual practices.

Data for the study was obtained through distribution of questionnaires to a pre-determined sample of employees in Ethiopian Pharmaceuticals Supply Agency. A total of 148 questionnaires were distributed to respondents and 140 were returned with a response rate of 94.6%. An overall value of Cronbach's alpha ($\alpha = 0.868$) was obtained and the overall internal consistency test of research instruments was found in "good" and reliability range. Regarding

the general information of respondents, 70% of them were male and 30% were female. Thus, gender of respondents was balanced. The majority (89.3%) of the respondents had first degree, second degree and above, this implies that respondents had sufficient level of education to understand and respond the items included in the study. Similarly, the majority (85%) of them had a work experience above 4 years.

The first objective of the study was to determine the statues of the logistics management practices in Ethiopian pharmaceuticals Supply Agency. Through the descriptive statistical analysis, an overall mean score was computed for each independent variable (logistics management practices). The study revealed that warehouse and inventory management ($M=3.7260$, $SD= 0.61812$) was relatively the most practiced logistics activity in Ethiopian pharmaceuticals Supply Agency followed by customer service ($M=3.6869$, $SD= 0.60058$). The study also brought out that transportation management, supply management and information flow management were also highly practiced next to customer service. The mean and standard deviation values were ($M=3.6694$, $SD= 0.76214$), ($M=3.5816$, $SD= 0.73678$) and ($M=3.5071$, $SD= 0.68321$) respectively.

The second objective of the study was to establish the relationship between logistics management practices and organizational performance in Ethiopian pharmaceuticals Supply Agency. The Pearson's Product Moment Correlation Coefficients were computed and able to obtain results about the relationships between the dependent (organizational performance) and independent variables (logistics management practices). The study showed that there is a positive and statistically significant relationship between each independent variable and the dependent variable.

Based on the Pearson correlation analysis result, there are a positive and significant correlation between practices of supply management, warehouse and inventory management, customer service, transportation management and information flow management, and organizational performance of the Agency. The mean and standard deviation values were ($r=0.817$, $p<0.01$), ($r=0.806$, $p<0.01$), ($r=0.795$, $p<0.01$), ($r=0.771$, $p<0.01$) and ($r=0.738$, $p<0.01$) respectively. Thus, the study discovered from Pearson correlation analysis that the relationship between each independent variable and dependent variable is strong according to Evans (1996) magnitude of correlation.

The third objective of the study was to examine the effect of logistics management practices on organizational performance of Ethiopian Pharmaceuticals Supply Agency. Multiple regression analysis was used to determine whether the independent variables were influencing the dependent variable. The model summary of multiple regression analysis revealed that R square value ($R^2 = 0.788$) demonstrated that 78.8% of the variation in the organizational performance of the Ethiopian Pharmaceuticals Supply Agency can be explained by the logistics management practices (independent variables) included in the model. However, the remaining 21.2% changes in organizational performance in the Agency are caused by other factors that are not included in the model. Thus, all the five logistics management practices have statistically significant and positive effect on organizational performance of Ethiopian Pharmaceuticals Supply Agency. As shown in the ANOVA model fit test table in previous chapter, the F-Statistic suggested that all the independent variables (practices of customer service, warehouse and inventory management, transport management, information flow management and supply management) were statistically and significantly predict the variation in organizational performance of the Agency at 95% confidence level ($F = 99.501$, $p < .001$), because all their p-values are less than alpha level of 0.05. The findings are supported by the literature which all of them were outlined as important logistics management practices in it. Thus, this shows that they are to a greater extent properly addressed in Ethiopian Pharmaceuticals Supply Agency.

The fourth objective of the study was to determine the challenges of logistics management practices in the Agency. Through the descriptive statistical analysis, an overall mean score was computed to determine the extent to which the different challenge parameters affected organizational performance of the Agency. The study indicated that Ethiopian Pharmaceuticals Supply Agency faced logistics management challenges that affected its organizational performance to a large extent with an overall mean of ($M=3.5807$, $SD=0.49746$).

All hypotheses were tested and the result indicated that H1, H2, H3, H4 and H5 were accepted because the sig. value is <0.05 , as established in the regression analysis results. Thus, all five practices of logistics management have statistically significant and positive effect on organizational performance of Ethiopian Pharmaceuticals Supply Agency.

5.2 Conclusions

Based on the findings presented in the former sections, the study has drawn the following conclusions. From the descriptive statistical analysis result regarding the statues of logistics management practice in Ethiopian Pharmaceuticals Supply Agency the study drew the following conclusions:

- All the practices of customer service, warehouse and inventory management, transportation management, information flow management and supply management were practiced frequently/ regularly.
- The study concluded that logistics management practices contributed to Ethiopian Pharmaceuticals Supply Agency performance to a great extent.

Regarding the relationship between logistics management practices and organizational performance, the study concluded that there is a positive and significant relationship between logistics management practices and organizational performance of the Agency. Further, all logistics management practices have strong relationship with organizational performance of Ethiopian Pharmaceuticals Supply Agency.

In relation to the predicting power of independent variables, the study concluded that the independent variables (logistics management practices) have predicting power on organizational performance of Ethiopian Pharmaceuticals Supply Agency. Thus, logistics management practices have statistically significant and positive effect on organizational performance of the Agency.

Regarding the logistics management challenges faced by Ethiopian Pharmaceuticals Supply Agency, the study concluded that the challenges were faced with a large extent.

In addition, all the hypotheses were strongly supported and the proposed framework of the study was able to demonstrate positive and significant relationship between independent and dependent variables. Therefore, notably this study has provided evidence for the direct effect of logistics management on organizational performance as advocated by the literature.

5.3 Recommendations

Based on the above findings and conclusions of the study the following recommendations were forwarded to the Ethiopian Pharmaceuticals Supply Agency managements.

The findings of the study showed that Ethiopian Pharmaceuticals Supply Agency adopted logistics management practices regularly. Moreover, the study confirmed that logistics management practices had strong positive relationship with organizational performance of the Agency. Hence, the study recommends that Ethiopian Pharmaceuticals Supply Agency ought to give priority and enhance the logistics management practices. If the Agency's Management practices logistics management activities at higher level, the Agency can significantly improve its organizational performance from the current position.

In addition, the study confirmed that the five logistics management practices significantly influence the organizational performance of the Agency. The study recommends the following to Ethiopian Pharmaceuticals Supply Agency to

- Exercise the practices and be more responsive to customer needs, creating customer relationship management including order management. In other words create interaction with customers and easing customer ordering system to take advantage of the positive impact of customer service practices on organizational performance.
- Have warehouse and inventory management strategy such as the use of enterprise resource planning (ERP) system to control pharmaceuticals and other medical commodities transaction, plan and optimize warehouse layout, maintain warehouse safety standards, keep accurate inventory records, conduct periodic inventory counting and stock planning, optimal inventory utilization and inventory management techniques (ABC Analysis and others).
- Implement fleet control system namely Geographical Physical System (make to functional the existing GPS), vehicle load planning, vehicle inspection schedule, cost-effective and responsive transportation system.
- Invest more on application of computers, internet and information communication systems than previously practiced, and enhance electronic data interchange.
- Implement properly the supply chain management (inbound and out bound logistics) to build the backward and forward integration for the benefits of the Agency itself, the suppliers and customers (health facilities).

The study established that the key logistics management challenges faced by Ethiopian Pharmaceuticals Supply Agency were shortage of foreign currency, lack of collecting receivables, lack of accuracy of quantification/forecasting, lack of integrated system, poor exchange of information and increasing logistics cost. The study recommends that Ethiopian Pharmaceuticals Supply Agency applies the following:

- Closely work with concerned government bodies and banks to prevent shortage of foreign currency.
- Exert more efforts to collect receivables from customers based on planning of collecting receivables using different mechanisms including harmonizing diplomacy.
- Apply proper and accurate need assessment and forecasting by investing or putting more efforts to work closely with concerned bodies (service delivery point namely health facilities).
- Apply quick computerized exchange of data and create smooth integration system between working units. Also provide management with summary exchange of information so as to equip leaders and higher officials with current and comprehensive knowledge about situation in the agency.
- Balance the level of service delivery with the cost of that provision to reduce the increasing logistics cost.

5.4 Limitations and suggestions for future research

Although there are notable contributions regarding the effect of logistics management practices on organizational performance as proved from this study, the significance of this study needs to be viewed and acknowledged in lights of its limitation. Thus, there are limitations in this study which are left for future investigation and can be addressed by the future studies. First, the study focused on five logistics management practices as stated in the previous sections. But the study did not include entire logistics management practices. The scope of the study can be further increased and enriched to include other variables (other logistics management practices) under the theoretical framework in future studies that might predict organizational performance holistically in Ethiopian context. Therefore, it proposes conducting further studies considering several other types of logistics management practices.

Second, the study only focused on the logistics management practices of Ethiopian Pharmaceuticals Supply Agency (focused on the Head Office excluding the branches). Therefore, future research should be conducted on a wider scale by considering branches from all over the country. The sample size can be bigger and broader to increase the representativeness and the results can be more gratifying. Similar studies should be conducted on manufacturing firms for comparing the logistics management practices between services and manufacturing firms. Lastly, the study considered the challenges of logistics management practices faced by Ethiopian Pharmaceuticals Supply Agency. But the study did not exhaustively consider the possible solutions. Therefore the suggestion for further studies is about dealing with other challenges of logistics management practices in Ethiopian Pharmaceuticals Supply Agency with their alleviation/improvement mechanisms.

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APPENDIX I: Questionnaire

Questionnaire

ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

MASTERS OF BUSINESS ADMINISTRATION PROGRAM

**Questionnaire to be filled by employees of Ethiopian Pharmaceuticals Supply Agency
(At center)**

Dear Participant,

I am a postgraduate student at Addis Ababa University college of Business and Economics, and I am conducting a study on “**The effect of logistics management practices on organizational performance: a case of Ethiopian Pharmaceuticals Supply Agency (At center level)**”. The purpose of the questionnaire is to collect primary data to conduct the study for the partial fulfillment of Masters of Business Administration. This is purely for academic purpose and the information you provide will be kept strictly confidential. Hence, I kindly request you to fill the questionnaire genuinely. Thanks in advance for your cooperation.

General Instruction

- Please do not write your name or address on the questionnaire.
- please put a tick (✓) mark in the appropriate box of your answer
- Contact address: if you have any question please contact me through the following addresses:

Telephone: **09 12-413681**

Email: **biruknati97@gmail.com**

Section A: General information

1. Gender:

Male ☐

Female ☐

2. Education level:

Certificate ☐

Diploma ☐

First degree ☐

Second degree and above ☐

3. Your work unit:

Quantification and Market Shaping Program Fund
Tender Management Revolving Drug Fund
Contract Management Laboratory Quality and Control
Warehouse and Inventory Management
Capacity Building and Operational Research
Distribution and Fleet Management

4. Work experience in your work unit:

2-3 year 4-5 years
6-7 years above 7 years

SECTION B: The statues of Logistics Management Practices in Ethiopian Pharmaceuticals Supply Agency (At center)

5. Questions related with logistics management practices. Please put a tick (✓) mark on the appropriate number to indicate the state of logistics management practice in Ethiopian Pharmaceuticals Supply Agency (At Center).

The items are five-point scales with:

- 1 = Never practiced
- 2 = Rarely practice
- 3 = Occasionally practiced
- 4 = Very often practiced
- 5 = always practiced

Item No	Logistics management practices	Scale				
		1- Never practiced	2- Rarely practiced	3- Occasionally practiced	4- V. often practiced	5- Always practiced
1	Customer Service practices					
1.1	Provide right product/pharmaceuticals and other Medical commodity/ to customers all the time	1	2	3	4	5
1.2	Quick response to customer needs	1	2	3	4	5

1.3	Proper customer compliant handling	1	2	3	4	5
1.4	Easy and flexible customer ordering system	1	2	3	4	5
1.5	Achieve minimum customer order processing cost	1	2	3	4	5
1.6	Regular customer satisfaction evaluation and measurement	1	2	3	4	5
2	Warehouse and Inventory management practices					
2.1	Proper material receipt	1	2	3	4	5
2.2	Use of enterprise resource planning (ERP) system to control material transaction	1	2	3	4	5
2.3	Storage space optimization	1	2	3	4	5
2.4	Accurate order picking	1	2	3	4	5
2.5	Planning and optimizing warehouse layout	1	2	3	4	5
2.6	Storing material according to recommended storage guide lines	1	2	3	4	5
2.7	Applying warehouse safety standards	1	2	3	4	5
2.8	Periodic inventory counting	1	2	3	4	5
2.9	Applying demand based replenishment	1	2	3	4	5
2.10	Inventory management system keeps cost at a minimum	1	2	3	4	5
2.11	Automated inventory recording	1	2	3	4	5
2.12.	Monitoring of stock movements	1	2	3	4	5
2.13	Determining of inventory levels	1	2	3	4	5
2.14	Applying inventory management technique (ABC Analysis)	1	2	3	4	5

3	Transport management practices					
3.1	Applying fleet control system	1	2	3	4	5
3.2	Vehicle scheduling	1	2	3	4	5
3.3	Vehicle route planning	1	2	3	4	5
3.4	Vehicle inspection schedule	1	2	3	4	5
3.5	Vehicles tracking system	1	2	3	4	5
3.6	Vehicle load planning	1	2	3	4	5
3.7	Timely material delivery	1	2	3	4	5
4	Information flow management practices					
4.1	Smooth information flow to all logistics functions	1	2	3	4	5
4.2	Adequate information flow in the logistics process	1	2	3	4	5
4.3	Reliable information flow in the logistics process	1	2	3	4	5
4.4	Information flow coordinates the logistics activities	1	2	3	4	5
4.5	Information flow communicates the logistics activities	1	2	3	4	5
4.6	Information flow uses to plan the logistics activities	1	2	3	4	5
5	Supply management practices					
5.1	Appropriate need identification	1	2	3	4	5
5.2	Effective purchase order processing	1	2	3	4	5
5.3	Automated Supplier catalogue	1	2	3	4	5
5.4	Exercising win-win negotiation with suppliers	1	2	3	4	5
5.5	Creating strategic relationships with suppliers	1	2	3	4	5
5.6	Regular supplier performance evaluation	1	2	3	4	5
5.7	Electronic exchange of information with suppliers	1	2	3	4	5

Please specify if there are any other logistics management practices in Ethiopian Pharmaceuticals Supply Agency -----

Section C: The Effect of Logistics management practices on organizational performance of Ethiopian Pharmaceuticals Supply Agency

6. Questions related with organizational performance. Please put a tick (✓) mark on the appropriate number to indicate the extent to which logistics management practices contribute to the organizational performance of Ethiopian Pharmaceuticals Supply Agency.

The item scales are five-point scales with:

- 1 = Not at all
- 2 = Small extent
- 3 = Moderate extent
- 4 = Great extent
- 5 = Very great extent

Item No,	Performance parameter	Scale				
		1- Not at all	2- Small Extent	3- Moderate Extent	4- Great Extent	5- Very Great Extent
1	Ethiopian Pharmaceuticals Supply Agency has increased customer satisfaction by applying logistics management practices	1	2	3	4	5
2	Logistics management practices have led to the growth of Ethiopian Pharmaceuticals Supply Agency market share	1	2	3	4	5
3	Through the implementation of logistics management practices Ethiopian Pharmaceuticals Supply Agency has grown its sales	1	2	3	4	5
4	Through the implementation of logistics management practices Ethiopian Pharmaceuticals Supply	1	2	3	4	5

	Agency has increased percentage of its pharmaceuticals/commodity availability					
5	Through the implementation of logistics management practices Ethiopian Pharmaceuticals Supply Agency has increased its profit	1	2	3	4	5
6	Competitive position of Ethiopian Pharmaceuticals Supply Agency has increased due to implementation of logistics management practices	1	2	3	4	5

Please specify if there is any other organizational performance measure which Ethiopian Pharmaceuticals Supply Agency must address in order to improve its performance-----

Section D: Challenges of Logistics Management Practices

7. Questions related with challenges of logistics management practices. Please put a tick (✓) mark on the appropriate number to indicate the extent to which the below challenges affect organizational performance of Ethiopian Pharmaceuticals Supply Agency.

The item scales are five-point scales with 1 = Not at all, 2 = Small Extent, 3 = Moderate Extent, 4 = Great Extent, 5 = Very Great Extent

Item No	Challenge parameter	Scale				
		1- Not at all	2- Small Extent	3- Moderate Extent	4- Great Extent	5- Very Great Extent
1	Shortage of logistics infrastructure	1	2	3	4	5
2	Increasing logistics costs	1	2	3	4	5
3	Poor exchange of information	1	2	3	4	5
4	Insufficient logistics management capacity	1	2	3	4	5

5	Lack of integrated system	1	2	3	4	5
6	Lack of modern management techniques	1	2	3	4	5
7	Inability to access and apply the growing logistics knowledge base	1	2	3	4	5
8	Foreign currency shortage	1	2	3	4	5
9	Lack of collecting receivables	1	2	3	4	5
10	Lack of accuracy of quantification/forecasting	1	2	3	4	5

Please specify if there are other logistics management challenges that Ethiopian Pharmaceuticals Supply Agency must address in order to improve the logistics management practices -----

