



**EFFECT OF PHARMACEUTICALS SUPPLY CHAIN MANAGEMENT
AND PATIENT/CLIENT SATISFACTION ON COMMUNITY
PHARMACIES: THE CASE OF ADDIS ABABA, ETHIOPIA**

BY

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Community Pharmacies: The Case of Addis Ababa, Ethiopia**

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Declaration

I Abiy Abreham declare that this thesis submission is my own work towards the award of the degree of Masters of Arts in Logistics and Supply Chain Management that to be the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the university for masters except where due acknowledgement has been made in the text.

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Date-----

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List of Acronyms

WHO: World Health Organization

USD: United States Dollar

IDNS: Integrated Delivery Net Work

FMHACA: Food, Medicine and Healthcare Administration and Control Authority of Ethiopia

FMOH: Federal Ministry of Health

MSH: Management Science for Health

PFSA: Pharmaceuticals Fund and Supply Agency

FDRE: Federal Democratic Republic of Ethiopia

USAID: United States Agency for International Development

SIAPS: System for Improved Access to Pharmaceuticals and Services

ED: Essential Drugs

HC: Health Center

NPD: Non Program Drug

ART: Antiretroviral Therapy

HF: Health Facility

RMNCH: Reproductive Maternal Neonatal and Child Health

Abstract

Effective supply chain management practices has become a valuable way of securing competitive advantage through customer satisfaction since competition is no longer between organizations, but among members of supply chains. The demand for medicine supply in Ethiopia has increased dramatically as the number of health facilities, including pharmacies, establishments has grown over the last two decades (WHO, 2016). Therefore, this study aims to outline factors associated with drug supply chain and their effect on the level of patient/client satisfaction in community pharmacies of Addis Ababa, Ethiopia. The study adopted a case study descriptive design. The targeted population comprises adults as well as Ethiopian of all gender, educational status, socio-economic status and residential areas, who requested pharmacy service in community pharmacies. This research used three dimensions of SCM practice (collaboration, information sharing and logistics design) and tested the effect of SCM practices on customer satisfaction. Representative samples are selected using a formula (Cocharan formula).The data for the study was collected from 385 customers of different community Pharmacies. In addition, a questionnaire also distributed for both Head pharmacists and Dispensers as a supporting data .The relationships proposed in the framework were tested using Pearson correlation, and the causal relations were analyzed using regression analysis. From the result of the analysis it is concluded that there is strong relationship between each SCM practices (Collaboration, Information sharing and Logistics design) and customer satisfaction. Therefore, in order to achieve advancement of pharmaceuticals service in the long-run through enhancing customer satisfaction, it is better for the community pharmacies to give due emphasis to the improvement of those SCM practices.

Keywords: *Pharmaceuticals, supply chain management, customer, satisfaction, practices, community pharmacies.*

Chapter One

Introduction

This chapter is going to address back ground of the study, statement of the problem, basic research questions, objective of the study, significance of the study, scope of the study, limitation of the study, operational definition of terms, and finally give organization of the study.

1.1 Background of the Study

Supply chain management in the public health sector has received increasing attention in recent years, as both a priority and a challenge for many countries, as health care institutions find themselves with increasing number of products, programs and patients to manage. Stakeholders in the healthcare supply chain can be divided in to the major groups: producers, purchasers, and providers. The role of producers is to manufacture medical products such as surgical supplies, medical devices and pharmaceuticals. Purchasers include distributors, wholesalers and group purchase organizations (GPOS). Distributors and wholesalers held inventory for producers in order to represent those at the end of the supply achieve economies of scale by aggregating the volume of member providers. Health care providers chain with the function to serve patients and include, among others, hospitals, integrated delivery networks (IDNS), physicians, clinics, nursing homes and pharmacies (Paul *et.al*, 2014).

Supply Chain Management Practices correctly applied in Public Health Institutions can contribute greatly in maintaining the availability of essential drugs in public health institutions. Firms hold inventory (stock) for two main reasons, to reduce costs like logistic costs and to improve customer service. The motivation for each differs as firms balance the problem of having too much inventory (which can lead to high cost) versus having too little inventory (which lead to cost of lost sales) (king and Phumpiu, 1996).

The largest share of the world's population that does not benefit from simple, safe ,effective pharmaceuticals; and millions of children and adults who die each year from common conditions that can be prevented or treated with modern medicines signal , fundamental failure of health care systems. In the late 1970s, 60 to 80 percent of people in developing countries were estimated as lacking regular access to even the most essential medicines. By 2003, WHO

estimated that less than half the citizens in 32 percent of the world's poorest countries lacked regular access to essential medicines, which improved on 1999 access estimates (WHO 2006c). Lack of access is directly related to income-81 percent of the countries with the lowest access to medicines also had the lowest incomes. Those who do have access to essential medicines often receive the wrong medicine, the wrong dosage, or a quantity insufficient for their needs. Some countries, many modern medicines are dispensed without prescription by untrained and unlicensed drug sellers. Even when patients and consumers receive the correct medicine, half do not consume it correctly. (Management Science for Health, 2012).

Many public health interventions depend on the availability, cost, and quality of pharmaceutical drugs. Although an intervention may be designed to meet health needs by delivering a vaccine or medicine to the population, real-world conditions may limit the program's effectiveness if there are pervasive barriers to the selection, financing, manufacturing, distribution or use of the required drugs. The principal goal of the emerging field of pharmaceutical management is to improve and expand access to quality medicines. In low and middle income countries, this is especially challenging due to paucity of domestic financial resources, human resources, technical knowledge, political will, or uncoordinated health efforts between public, private, and international actors (Brandon, 2010).

Unlike other goods and services health care services embody some unique characteristics stemming from inherent market failures. First is the asymmetry of information, and agency challenge of physicians, acting as agents of patients. Patients are aware they don't feel well but they rely on health professionals, often physicians, to act as their agents in diagnosing and treating ailments. Patients are ill-equipped to assess the adequacy and quality of physician decisions and actions, and therefore focus on the environmental and interpersonal aspects of clinical services, the elements they are best able to evaluate (Maureen, 2006).

For nearly 25 years, the world health organization has identified meeting individual's universally legitimate expectations as a key health system objective. Patient satisfaction and rating have been given increasing importance for measuring the quality of health services and are routinely used in developed countries for continuous quality improvement and value-based incentive payments. In addition to the intrinsic importance of meeting reasonable expectations, patient satisfaction

and perceptions are associated with health care utilization and choice provider (Emily *et.al.*2012).

The Ethiopian local pharmaceutical market is growing at an annual rate of around 15%; it is currently valued at over USD400 million from below USD 200,000.00 in 2000. The share of the domestic pharmaceutical market held by locally produced medicines is around 20% and rest is filled by importation. The government of Ethiopia has commitment to improve local production by supplying 50% of the national medicines demand and export of medicines worth USD20 million by end 2025. The demand for medicine supply in Ethiopia has increased dramatically as the number of health facilities, including pharmacies, establishments has grown over the last two decades (WHO, 2016). Therefore, this study aims to outline factors associated with drug supply chain and their effect on the level of patient/client satisfaction in community pharmacies of Addis Ababa, Ethiopia.

1.2 Statement of the Problem

In Ethiopia, majority of the common leading causes of morbidity (Pneumonia, Malaria, Acute Upper Respiratory Infections, Helminthiasis, Acute Febrile Illness and Diarrhea) and mortality (Pneumonia, Tuberculosis, Malaria, Neonatal Sepsis and Meningitis) can be substantially reduced if carefully selected, low-cost pharmaceuticals are available and appropriately used (Abiye *et al.*,2013).In this regard efforts have been made to increase the accessibility of essential drugs such as increasing budget allocation by government and adaption of the pull system, but researches showed that availability of essential drugs in public health facilities in various part of the country is still a challenge(Carasso *etal.* 2009; FMOH, 2011; Nigussie, 2014).

Availability of essential drugs is the construct of the components of the pharmaceutical supply chain (selection, quantification, procurement and distribution), and a failure in one part of the system leads to the failure of the whole pharmaceutical management process. Lack of effective pharmaceutical supply chain not only affects the availability of essential drugs but also significantly affects efficiency. Deficiencies in selection, quantification, storage, as well as high prices, poor quality, theft, expiration of drugs, irrational prescribing and incorrect use of medicines by patients cause losses totaling 70% of the original expenditure (MSH,2011)

According to the government of Ethiopia mission statement, “ the government has commitment to improve local production by supplying 50% of the national medicine demand and export of medicine worth 20 million by end 2025” (WHO,2016), satisfying the demand of the whole health care system in general and the medicine demand in particular is mandatory. As a capital city of Ethiopia, Addis Ababa houses many organizations that have stake with the pharmaceutical supply chain including, the Central Pharmaceutical Fund and Supply Agency (PFSA), and around 130pharmaceutical importers and wholesales (FMHACA, 2013). Moreover, many pharmacy and other health professionals, health facilities, and non-governmental organizations that work on the health sector are more concentrated in Addis Ababa than other part of the country (FMOH, 2013; Charities & Societies Agency, 2010). Hence, any problem in the pharmaceutical supply chain in Addis Ababa has the probability of being manifested throughout the country.

In addition to hospital pharmacies and other health care facilities, community pharmacies are one important aspect of the health care environment, since the society is getting its medicine requirement from them. However, recently patient/clients that are visiting these community pharmacies are not getting the drugs or other health care materials they required all the time. In preliminary study before hand, many pharmacists and drug dispensers report that they are unable to get the drugs / medical supplies that are required by the community pharmacies to satisfy their customers’ demand currently. Some others report that they are having problems in setting prices for drugs and medical supplies since there is high fluctuation in purchasing those drugs and medical supplies from whole sales and importers. These specifically affect chronic patients (people that are taking medications in order to control their health states lifetime, example people living with diabetes and hypertension) and people who are dependent on taking drugs regularly in order to maintain their health condition(people living with HIV/AIDS). These drugs, the drugs which are taken by chronic patients regularly, are not only costly but also disappear from market for unlimited time.

In response this problem the current study investigated the authenticity of these complaints through determination of the availability drugs,other products required, making the community pharmacies more helpful and gets their customers satisfied from the service they get.

1.3. Basic Research Questions

- What is the practice of drug supply chain management in community pharmacies of Addis Ababa?
- What is the reaction of patient/client satisfaction on the service of community pharmacies of Addis Ababa?
- What is the effect supply chain management on patient/client satisfaction?
- What are the challenges for community pharmacies operating in Addis Ababa hindering to meet their patients/clients expectation?

1.4. Objective of the study

1.4.1. General Objective

The general objective of this study is to analyze the effect of drug supply chain management on level of patient/client satisfaction in community pharmacies of Addis Ababa.

1.4.2. Specific Objectives

The specific objectives of this study are:

- ❖ To determine the practice of drug supply chain in community pharmacies of Addis Ababa.
- ❖ To assess the reaction of patient/client satisfaction on the service of community pharmacies of Addis Ababa.
- ❖ To assess the effect of supply chain management on patient/client satisfaction.
- ❖ To identify challenges for community pharmacies operating in Addis Ababa hindering to meet their patients/clients expectations.

1.5. Significance of the Study

This study assessed factors associated with patient/client satisfaction such as provider ability, wait time, drug availability, facility appearance, patient/client expectation...etc; and identify some of the challenges related with patient/client satisfaction in community pharmacies of Addis Ababa. The finding and recommendation of the study will be useful for policy makers and other stakeholder to find ways of improving patient/clients satisfaction level.

The study may contribute to government policy formulation that would enable constant availability of drug and medical supplies in pharmacies as well as public health institutions. This in turn results in improved service provision in health sector. In addition to this, the study assists stakeholders (producers, importers, wholesalers, distributors and retailers) in their endeavor to utilize supply chain management practices to improve inventory. The study can also be useful for academicians to study further in the area.

1.6. Scope of the Study

The scope of the research is to see the effect of drug supply chain management on patient/client satisfaction in community pharmacies of Addis Ababa. Addis Ababa City, the capital city of Ethiopia covers an area of 540 km with a total population of 6.6 Million. The population of Addis Ababa in the year 2017 as per estimated data=6.6million (population of 2017 .com). It is administratively sub-divided into 10 sub-cities (City Government of Addis Ababa, 2012). According to 2017 health and health related indicator there are 11 public hospitals, 37 private and NGO hospitals, and 50 Health Centers, while 25 more Health Centers are under construction. 308 community pharmacies and 232 drugstores are also active in the city. The study conducted on thirty-one (31) selected pharmacies in Addis Ababa. This study was conducted from November, 2017 to May, 2018 in HCs in Addis Ababa. The study utilized both quantitative and qualitative research methods through a case study descriptive design. The study does not include hospital pharmacies, drug stores, rural drug vendors and community pharmacies that are not found in Addis Ababa. This is due to time and budgetary constraints.

1.7. Limitation of the Study

The limitation of the study is that it only focuses on the case of “community pharmacies” of Addis Ababa. Assessing the effect of drug supply chain management on the level of patient/client satisfaction in hospital pharmacies, drug stores, drug vendors, other stakeholders of the pharmaceutical sector in Addis Ababa; and detailed analysis of data is needed for further conclusion.

1.8. Operational Definition of Terms

Drug: natural or synthetic substance which (when taken into a living body) affects its functioning or structure, and is used in the diagnosis, mitigation, treatment or prevention of disease or relief of discomfort.

Drug supply chain management: managing drug supply and demand ,sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channel, and delivery to the customer.

Patient/client satisfaction: the degree of positive feeling that patients/clients experience having used a service.

Pharmacy: a shop or hospital dispensary where medical drugs are prepared or sold.

Community pharmacy: any place under the direct supervision of a pharmacist where the practice of pharmacy occurs or where prescription orders are compounded and dispensed other than hospital pharmacy or a limited service pharmacy.

Pharmaceuticals: all medicine, laboratory reagent, medical supplies and medical equipments.

1.9. Organization of the Study

This study is organized as follows: in chapter two, a brief literature review of current publications that are related to patient / client satisfaction and drug supply management is presented. This is followed by research methodology consists of a case study describing what and how of patient/client satisfaction level. Next to this, drug supply chain management is placed as a means to bring optimum patient satisfaction level. Synthesis and analysis of data is presented to highlight some aspect of the above mentioned case, focusing on problems and solutions that are critical to achieve optimum patient/client satisfaction level. Lastly, the final chapter presents summary of major findings, some conclusions and recommendations.

Chapter Two

Related Literature Review

2.1. Theoretical Review

In this part concept of supply chain, supply chain management, drug supply chain management, customer/client satisfaction and patients' satisfaction will be discussed as they are stated by different writers as follows: "A supply chain is the alignment of firms that brings products or services to market." (Lamber *etal*, 1998). "A supply chain consists of all stages involved, directly or indirectly, in fulfilling customer request. A supply chain not only includes the manufacturer and suppliers but also transporters, ware houses, retailers, and customers themselves." (Chupra *etal*, 2001). From the above two scholars, one can understand that all business activities are incorporated in supply chain activities.

After seeing some definitions of supply chain then let us see the definition of supply chain management; "supply chain management is the systematic, strategic coordination of the traditional business functions and the tactics across these business functions within the supply chain, for the purposes of improving the long term performance of the individual companies and the supply chain as a whole" (Mentzer *etal*, 2001). According to Jabulani Nyenwa (2005), there are four kinds of supply chain management. These are full supply where supply matches demand; limited supply here demand exceeds supply; integrated supply (the supply chain is a network of suppliers, factories, warehouses, distribution centers and retailers through which raw materials are acquired, transformed and delivered to customers.); vertical supply (this is an arrangement in which the supply chain of a company is owned by that company). He also mentioned about some test of supply chain management, he called this test acid test which is the barometer of effective supply chain management. As he stated it, an effective drug supply chain management can be tasted by the availability of the right medicine, in the right quantity, for the right patient, at the right time, in the right condition, at the right price. (Jabulani Nyenwa, 2005).

Supply chains are critical in defining the ultimate cost and accessibility of medicines. A well functioning health supply chain provides broad geographic access to affordable, high quality

products. In addition, good supply chains operate with efficiency, adaptability, and financial integrity. (WHO/HAI, 2008; Asante, Aikins, 2008).

Effective procurement is an important step in pharmaceutical logistics system. An effective procurement process seeks to ensure the availability of the right pharmaceuticals, in the right quantities, at reasonable prices, and recognized standards of quality (MSH,2011).It is dependent on the routine availability of logistics data (e.g., rate of consumption and stock levels) and the capacity to select products and to forecast and quantify needs(Raja et al., 2006.) In Tanzania, only 25% of the health facilities surveyed conducted quantification on annual bases, and majority of them did not provide training on quantification to the staff (MOHSW, 2008).There are numerous mechanisms by which health facilities manage their in-house procurement of pharmaceuticals ranging from open tender to direct procurement. They may procure pharmaceuticals by schedule or as needs arise. All these mechanisms have their own advantage and disadvantage in different situations. For example, a survey of health facilities in Tanzania revealed that the main method of procurement used by the facilities was direct procurement-the main supplier being the Medical Stores Department, a semi-autonomous unit under the Tanzanian ministry of health. The Medical Stores Department on other hand procures Essential Drugs through international competitive biddings (MOHSW, 2008).

A well-organized pharmaceutical supply chain management ensures the continuous availability of all pharmaceuticals that are required for patient care. At the same time, an effective pharmaceutical supply chain should be able to respond to sudden increases in drug demand, ensuring that adequate supplies are available to deal with any emergencies that arise (FMOH, 2010).Stock availability is the ultimate measure of the other components of the supply chain management and it also gives an idea of the overall effectiveness and efficiency of the system, from forecasting and procurement to distribution, storage and inventory management(John Snow Inc./DELIVER, 2004).

Measuring the availability of Essential Drugs at health facilities is one of the core components of the assessment of readiness of facilities to deliver quality services. The health facility assessments, however, employ a wide variety of tools and approaches to measure availability of Essential Drugs. For example, rapid assessments employ the reported availability by

respondents without verification as a measurement of availability of Essential Drugs, while in-depth facility assessment methods validate the reported response by observing the medicines, verifying the expiration dates and collecting further data on stock-out over an extended period. As a result, medicine availability estimates may vary across definitions, and need to be interpreted with careful consideration of the methods used (Choi & Ametepi, 2013). Researches done in Sub-Saharan countries showed that availability of Essential Drugs has been improved, but still far from the WHO recommended target of 100% (WHO, 1993). In Ghana, the availability of key Essential Drugs selected for the country in public health facilities was 80%; and length of stock out duration 29.9 days (Ministry of Health of Ghana 2009). In Tanzania, Uganda and Kenya, all of them East African countries, the availability of key Essential Drugs was 88.9%, 45.7% and 82.6%, respectively (MOHSW, 2008; Ministry of Health of Uganda, 2008; WHO, 2009). Though the availability of Essential Drugs seems high in the health facilities of Tanzania, the same facilities also presented a considerable number of stock-out days. Some medicines were out of stock for 4 months with the median number of stock-out 135.6 (MOHSW, 2008). In Uganda, the length of stock-out duration in public health facility pharmacy was 72.9 days (Ministry of Health of Uganda, 2008). A cross-sectional study conducted in health centers of Western Ethiopia showed that only 55.6% of the assessed drugs were available (Abiye et al., 2013).

The choice of essential medicines depends on many factors, such as the pattern of prevalent diseases, treatment facilities, the training and experience of available personnel, financial resources, and environmental factor (MSH, 2011). In health facilities found in Sub-Saharan countries where resources are scarce, wise selection of medicines most relevant to the health facility is indispensable. Spending the available scarce fund in duplicative and unnecessary drugs may lead to the stock-out of other essential medicines. (MOHSW, 2008). Essential Drugs require specific procedures and conditions for safe storage that protect their integrity and effectiveness, maximize their shelf life, and make them readily available for distribution. The procedures should include about the dimensions and design of the storage space, appropriate conditions for storage of drugs, and the importance of stock rotation and systematic arrangement of stock, as well as attention to cleanliness, fire-prevention measures, and security within the store.

A drug product must retain its properties within specified limits in order to be useful. When Essential Drugs are stored appropriately, clients can be assured that they will receive a high-quality product. The stability of a drug product depends on the active ingredient, which can be affected by its formulation and packaging. Inadequate storage and distribution can lead to physical deterioration and chemical decomposition, and reduced potency (MSH, 2011).

In Sub-Saharan countries like Uganda, and South Sudan, only 63.6% and 35% of the surveyed health facilities had adequate storage practices, respectively (Ministry of Health of Uganda, 2008; GhTech, 2011). In Kenya, adequacy of storage in public health facilities was only 60% (WHO, 2009). A study done in Tanzania probably showed the situation of storage practice of pharmaceuticals in detail. The study revealed that most health facilities (71%) had a main storage place, but the storage space for forecasted quantities of medicines and medical supplies was inadequate and this was affirmed by 56% of facilities surveyed. The study reported that expired stocks did have a separate storage space in only 41% of the health facility pharmacies. As regards products requiring cold storage, only 52% of the health facilities had the equipment (MOHSW, 2008).

Pharmaceutical logistics data are collected, processed, and reported through LMIS, increasing the likelihood of an adequate supply of Essential Drugs. An effective LMIS may be manual or computerized collecting essential data about stock status and consumption. It ensures accountability, a reduction in supply imbalances (stock outs and overstocks), and efficient, cost-effective pharmaceutical logistics. Because a pharmaceutical logistics system cannot function effectively without timely, accurate LMIS data, the LMIS is an essential tool. It provides personnel responsible for pharmaceutical logistics with the information they need to react or, more important the information they need to anticipate demand (Shawkey & Hart, 2003). To be effective, LIMS should be equipped with adequate trained staff, forms, equipments, and facilities. However, some studies showed that there is a problem in this regard (MOHSW, 2008; GH Tech, 2011). LMIS is an important tool in inventory management, therefore accurate record keeping is essential. A study in Tanzania reported 8% and 72% recorded balance that was less and greater than the physical count (Kagashe & Massawe 2012). Another study done in Tanzania showed that often neither minimum nor maximum levels were defined (MOHSW, 2008). To the worst, in South Sudan, only 27% of the assessed health facilities were reported to fill forms accurately (GH Tech, 2011).

The current Ethiopian health care system is guided by a National Health Policy which was issued in 1993 following changes of government in 1991 (MOH,1993). The policy was the first of its kind in the Ethiopia in a sense that it incorporates elements of democratization, decentralization, inter-sectoral collaboration, collaboration with neighboring countries, and promotion of the participation of the private sector in health care. The policy also calls for the promotion of occupational health and safety, environmental health and the extension of health services to pastoralists and other rural populations, the urban poor and victims of manmade and natural disasters (Kloos H.1997). In response to high burden of ill health and high rate of mortality in the country because of poor access to health services and complex health system, the Ethiopian government has sought to reform the health service system into a cost-effective and efficient system for past several years. Accordingly, a twenty-year health development implementation strategy, known as Health Sector Development Program (HSDP) with a series of five-year investment programs was launched in 1998 which is aligned with the wider frameworks of Plan for Accelerated Development to End Poverty and Millennium Development Goals. Currently the country is implementing the fourth year of HSDPIV (FMOH, 2011).Regarding the health delivery system, Ethiopia implemented a three-tier health service delivery system characterized by a first level of a Woreda /District health system comprising a health center (40,000 population) in urban areas, and primary hospital (with population coverage of 60,000-100,000 people), health centers (1/15,000-25,000population) and their satellite health posts (1/3,000-5,000 population) in rural areas that are connected to each other by a referral system. A primary hospital, health center and health posts form a primary health care unit with each health center having five satellite health posts. The second level in the tier is a General Hospital with population coverage of 1-1.5 million people; and the third a Specialized Hospital that covers population of 3.5-5 million(FMOH, 2011).

As part of the health care reform, Business Process Reengineering (BPR) was employed in Ethiopian Fiscal Year 2001 with key principle of bringing a significant improvement in the quality of health services through the institutionalization of accountability and transparency. One mechanism of achieving this was to seriously consider the separation of purchaser, provider and regulator in the health system (FMOH, 2011).As part of this important endeavor, the former Drug Administration and Control Authority (DACA) has undergone an institutional transformation to a new agency called Food, Medicine and Health Care Administration and

Control Authority (FMHACA). The mandate of the new agency is to undertake inspection and quality control of health and health related products; premises, professionals and health delivery processes in an integrated manner (HPR of FDRE,2010).The National Drug Policy of 1993 which is part and parcel of the health policy has served as an umbrella for pharmaceutical services in Ethiopia (MOH,1993).Since the start of HSDP I, the government of Ethiopia was committed to ensuring community's access to the essential medicines that are safe, effective and of assured quality including rational drug prescription and use.

Moreover, since HSDP III a number of reforms have been employed that have significant impact on quality of pharmaceutical service. One of the reforms is the Pharmaceutical Logistics Master Plan (PLMP) which was introduced in 2009 with the aim of ensuring the uninterrupted supply of essential, quality and cost-effective pharmaceuticals at all health facilities (FMOH, 2009). To achieve this, the Pharmaceutical Fund and Supply Agency (PFSA) were created with mandates: to supply the entire country with both Program and Essential pharmaceuticals, as well as serve as the distribution entity for vaccines, other health facility supplies, and laboratory equipment (The World Bank, 2009).So as to execute its mandate in the area of pharmaceuticals supply in an efficient and effective manner, PFSA developed the integrated pharmaceuticals logistics system that integrates the drug, distribution, and reporting of essential pharmaceuticals that used to be managed vertically into a single mechanism (FMOH, 2009).

The next point is about customer satisfaction. First, it is better to see the importance of customer satisfaction; according to Schoenfeld (2008), customer satisfaction is important because it will help us guaranty that our customer will continue to buy our products or services. "iso9001:2000, section 8.2.1 customer satisfaction, says the following:

As one of the measurements of the performance of the quality management system, the organization shall monitor information relating to customer perception as to whether the organization has met customer requirements. The methods for obtaining and using this information shall be determined." (Schoenfeld, 2008)

Finally let us see what patient satisfaction is. Among the scholars who wrote about patient satisfaction, Ifikar Ahmed and Sirajud Din (2010) are one of them. They defined satisfaction and

patient satisfaction as follows: “satisfaction is a psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with consumer’s prior feelings about the consumption experience. While patient satisfaction has been defined as the degree of congruency between a patient’s expectations of ideal care and his/her perception of the real care him/her receives.” (Ifikar A. and Sirajud D., 2010).

2.2 Empirical Review

According to an article called “Managing Drug Supply” published in “Essential Drugs Monitor” (1998), health services throughout the world are presented with a fairly common set of health problems for which essential drugs have an important role; through the relative frequencies of specific illness vary among countries. In addition to this, if carefully selected, low cost pharmaceuticals are available and appropriately used, there would a huge reduction of mortality caused by illness in developing regions. Even in industrialized countries efficient drug supply management is important to reduce escalating costs of health care and bring effective and affordable health care service globally. In contrast to this, the experience of many countries showed that substantive and sustainable improvement in the supply and use of drugs are possible. Negative experience of the past has shown that success cannot be achieved if there is no clear goals, sound plans, effective implementation and monitoring of performance.

John (2015) and his colleagues put pharmaceutical supply as complex and overlapping. “ the pharmaceutical supply chain is complex , and involves multiple organizations that play differing but some- times overlapping roles in drug distribution and contraction price variability across different types of consumers is a common phenomenon due to the level of complexity”.(John *etal*,2015). The above mentioned people put pharmaceutical supply as a difficult task for policy makers. To understand this, assessing all supply chain related issues is mandatory. They also put expressions of inefficient supply chain as follows: product discontinuity, product shortages, poor performance, lowered patient safety, dispensing errors and technological errors causing stock shortages in pharmacies.

Ayad (2011) put inventory as the stock of pharmaceutical products retained to meet future demand. “Inventory represents the largest asset in pharmacy practice, and its value continues to rise because of the growth in variety and cost of pharmaceutical products,” (Ayad, 2011). According to Ayad (2011), in pharmacy practice, the role of efficient inventory management

from both financial and operational perspective is very huge. Ayads' (2011) conclusion is that inventory management is reducing carrying costs, while maintain an effective stock of products to satisfy customer and prescriber demands.

Mezid M. (2014) stated that majority of the common leading causes of morbidity can be substantially reduced if essential drugs (EDs) are made available and appropriately used; where functioning of pharmaceutical logistics system is necessary in Ethiopia. Mezid M. (2014) further stated that tracking changes and improvements of the pharmaceutical logistics performance is important. His target was to study the pharmaceutical logistics system of health centers (HCs) in Addis Ababa giving emphasis to non-program drugs (NPDs). At the end of his research he is able to draw the following conclusions: "there was no major problem common to all HCs regarding drug selection. In adequate supply of NPDs at PFSA (pharmaceutical fund and supply agency) was a major obstacle for the overall logistic system. Transportation of NPDs and infrastructure related to medicine waste management were not adequate, therefore, PFSA should enhance its capacity in all aspects. HC's pharmacy, stockholders should construct standard stores and medicine waste disposal sites" (Mezid M, 2014).

Marks (2009) and Yadav *et al* (2011) stated that the world health organization (WHO) defines access to medicine as a priority for citizens. "Medicine needs to be available at all times in adequate amount, in appropriate dosage and quality and at an affordable price for individuals and communities." (Marks, 2009 and Yadav *et al*, 2011). They have also estimate that two billion people do not have access to medicines and four million lives per year could be saved in Africa and south East Asia with the appropriate treatment and medicine. Based on their estimate, WHO and 192 states committed themselves to reaching eight millennium development goal on the list to reduce the child mortality rate, to improve maternal health and to combat HIV/AIDS, malaria and other disease (WHO,2012). The other person related to this issue is Anna (2013). She said that WHO focuses on policies, access, quality and rational use, so as to ensure medicine availability, as it is displayed in the figure below.

Anna (2013) also said that to ensure people have access to essential medicines and to preserve the quality of the medicine, a functioning medicine supply chain is necessary, which includes procurement, appropriate ware housing and efficient transportation.

Mohamed B. Ayalew (2017) and his colleague defined patient/ client satisfaction as the degree of positive feeling that patients/clients experience having used a service. He also puts patient/client satisfaction as the gap between quality of service expectation and the actual experience of the service provided from the patients' point of view. According to Mohammed B .Ayalew (2017) and his colleagues "patient satisfaction has become an integral component of the quality of health care services. It is becoming a popular health care service. It is becoming a popular health care quality indicator, in which pharmaceutical services are an essential part as it reflects the reality of service or care provided. It is an established fact that satisfaction influences adherence and seeking for medical attentions" (Mohammed B. Ayalew *etal*, 2017).

Mohammed B. Ayalew (2017) and his collagens has also done a review to explore the link between treatment satisfaction and adherence, compliance, and persistence and concluded that greater treatment satisfaction was associated with better compliance and improved persistence. According to the above mentioned researchers, assessing patient satisfaction is an approach for identifying and meeting patients' needs. Providing better access to quality pharmaceutical service is a way to improve patients' satisfaction with health-care service. Low or high level of patient's satisfaction and expectation of the pharmacy service might be influenced by a variety of factors. Some of these factors are demographic characteristics of the patient, waiting time, pharmacy setting, medication availability, and service quality. Furthermore, the patient satisfaction level is found to be directly associated with patients expectations.

From the study by SIAPS, (2017) "in Ethiopia, the pharmacy practice at public health facilities (PHF) and community pharmacies has largely been commodity centered than patient centered. This has prevented pharmacists from being active members of the health care team and contributing to better health outcomes. The lack of auditing practices and of transparent and accountable systems for managing medicine transactions and services at public health facilities have resulted in wasted resources, particularly those obtained through donations, including medicines for opportunistic infections and anti-malarial medicines" (SIAPS, 2017).

According to Owonaro (2017), contemporary pharmacy practice exhibits an evolving paradigm shift from traditional medication dispensing to more active and expanded clinical roles, such as dirking of patient on dedication, counseling, screening prescriptions, dispensing and any other management work related to the stocky of medications activities. (Owonaro A Peter, 2017).

Today, contemporary pharmacy practice exhibits an evolving paradigm shift from traditional medication dispensing to more active and expanded clinical roles, such as clerking of patient on medication counseling, screening prescriptions, dispensing and any other management work related to the stocking of medications activities. Medication counseling has become a key priority for modern community pharmacists. Medication counseling implies the provision of medication information orally or in written form to the patients or their caregivers on rational use of their medications. Studies have shown that right medication counseling by pharmacists identify and correct potential drug therapy problems, side effects and adverse drug reactions. This will provide patient satisfaction with the pharmaceutical services and consequently optimize the patient quality of care. This implies that patient's expectations are being met and patient quality of life equally improves (Yang S, Kim D, Choi HJ Chang MJ, 2016).

Pharmaceutical care is the key factor in pharmacy practice globally. This is aims providing a better outcome for the patients. Patient satisfaction is one of those outcomes. For pharmacies to have high patronage, their service must be attractive for patient inflow. Patient satisfaction is likely to affect the image of the Pharmacist and pharmacy profession. The need to track patient satisfaction and improvement of pharmaceutical services is vital (AzukaCO, Ehijie FOE,Obhie AA,2004;Al-Arifi MN2012).Drug manufacturing, dispensing and giving pharmaceutical care to patients will continue to be the primary responsibility of the pharmacist. Hence, proper evaluation of the level of satisfaction with medication counseling is pivotal components for predicting the quality of pharmacy services provided by the pharmacy. Medication counseling refers to “providing medication information orally or in written form to the patients or their caregivers on directions of use, advice on side effects, precautions, storage, and diet and lifestyle modifications”. This will enhance rational use of medicines by the patients and Health professionals. Although, the legal mandate have been given to the Pharmacists to provide medication counseling to every patients, but they have failed to offer drug information to their patients or just provide brief counseling upon patient request (Wilcock M, Harding G,2011).

In this part, different gaps identified from literature which are used as a resource in this paper listed as follows. In the paper called “Assessment of Pharmaceutical Logistics System in Health Centers of Addis Ababa” by Mesid Mudzteba (2014), only able to include 10 old health centers in his study out of 50 health centers in Addis Ababa city. He had better include few new health

centers for the purpose of comparison. As there are a lot of health centers under construction, the expected input from them would have been immunes for the study.

From the article called Managing Drug Supply in Essential Drug Monitor issue no.25&26(1998), it is indicated that substantive and sustainable improvement in the supply and use of drugs is possible. However, it is not indicated in terms of figures. It would have been better if it is indicated by how much percent or degree the improvement is possible.

Optimizing Drug Supply Chain in Hospital Pharmacy Department done by John Mensah and David Asamoah (2015) stated a lot about different supply chain practices giving stress on wait time. But, they did not give any additional empirical findings to other parameters like product discontinuity, unavailability of products...etc.

In “ Analysis of Challenges of Medical Supply Chains in Sub-Saharan Africa Regarding Inventory Management and Transport and Distribution” by Anna Schopperle (2013), there are a lot of good points mentioned about its major objective(identifying challenges for reliable medicine supply chains with effective in-country distribution systems regarding the medicine availability due to inventory management and transport distribution). In addition to this, it would have been better if it has included patients’ opinion about the case along with the professionals working in supply area to get a comprehensive view about the entire supply chain. Furthermore, patients are the ultimate users of medicines that have passed through each and every supply system, their feedback is very important to evaluate the whole supply system.

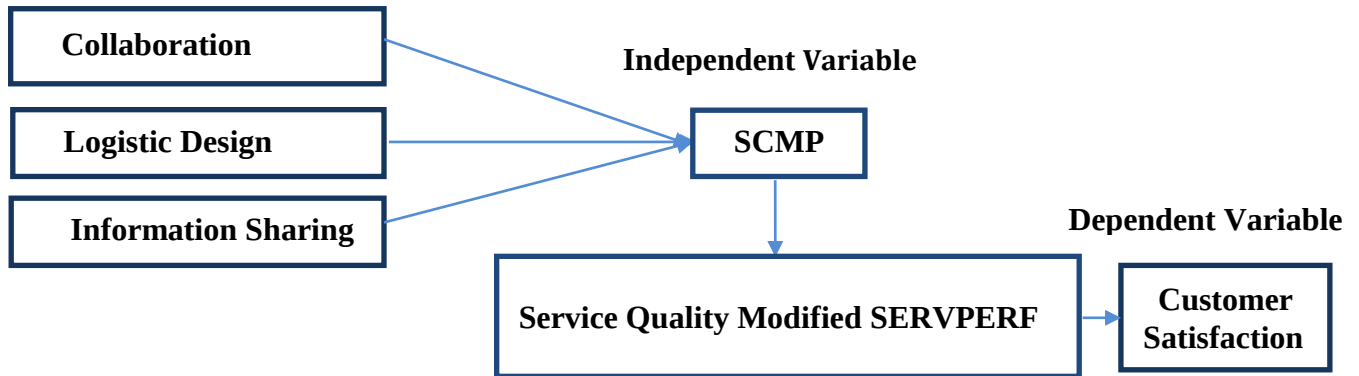
Patients’/clients’ Expectation toward and Satisfaction from Pharmacy Service by Mohammed (2017) *etal* have strong findings about patients’/clients’ expectation. However, it has only included patients/clients who were visited hospital pharmacy. It would have been better if it has included the perception of pharmacists, dispensers and other health professionals working in the hospital to counter check the result obtained as a secondary source of data.

2.3. Conceptual Framework

The following is simple conceptual framework that explains the relationship among the dependent variables tangibles, reliability, responsiveness, assurance and empathy as a measure for patient/client satisfaction with that of the independent variable drug supply chain

management. The conceptual model below identifies the link between effects of supply chain management practices on customer satisfaction. The framework proposes that SCM practices will have an effect on customer satisfaction both directly and also indirectly. These factors, factors used to measure patient/client satisfaction, are adapted from SERVPERF model. SERVPERF is a modification of SERVQUAL model, and thus uses the same categories to assess service quality. It uses an idea of perceived service quality leading to satisfaction. For the retailing contexts where the service is more prominent than the goods SERVPERF is more appropriate (Mattsson J, 1992). SERVQUAL model is one of service quality measurement models which have been extensively applied and been developed by Parasuraman *etal.*(1985,1986,1988,1991,1993,1994; Zeithamal .,1990).

Conceptual Framework



The above stated 5 factors are explained as follows:

1. Tangibles-physical facilities, equipment and appearance of personnel.
2. Reliability-ability to perform the promised service dependably and accurately.
3. Responsiveness-willingness to help customers and provide prompt service.
4. Assurance (including competence, courtesy, credibility and security) – knowledge and courtesy of employees and their ability to inspire trust and confidence.
5. Empathy (including access, communication, understanding the customer) - caring and individualized attention that the firm provides to its customers.

Chapter Three

Research Methods and Design

3.1. Introduction

This chapter will discuss the methodologies that would be used in gathering the data, analyzing the data and reporting the results. The main aim here is at explaining the methods and tools that will be used in collecting and analyzing data to get proper information related to the impact and challenges of drug supply chain management practices on level of patient/clients satisfaction in Addis Ababa.

3.2. Research Approach

In this study, inductive research approach is used. This approach is selected due to the following reasons: there is generalization from particular observations of the case under study, generalizing is from the interaction among the dependant variable and independent variables as they are indicated in the conceptual framework. In addition, both qualitative and quantitative research method is employed for exploring and understanding the meaning of the impact and challenges of drug supply chain management practices on level of patient/clients satisfaction in Addis Ababa.

3.3. Research Design

The study adopted a case study descriptive design. According to Donald and Pamela (2006), descriptive research is a descriptive study deals with the what, how and WHO of a phenomenon which is the concern of this study. “Case study is preferred in examining contemporary events, but when the relevant behaviors cannot be manipulated. Case study has a general advantage when a how or why questions are being asked over which the investigator has little or no control” (Robert K.Yins, 2009).

The study specifically tried to ascertain the supply chain management practices among selected community pharmacies in Addis Ababa and will sight to show their relationship to patient/client satisfaction. The study identified the challenges faced in the adaption of supply chain management practices. Descriptive design is considered appropriate for the study since it

helped to describe the phenomenon under study in its current state and its characteristics from a larger number of respondents at lower cost within a short period of time.

3.4. Population of the Study

Polit and Hungeler (1999; 37) refer to population as aggregate or totality of objects, subjects or members that conforms to a set of specifications. According to Addis Ababa's city administration, the total population is estimated about 6.6 million out of which about 3.85 million (58.33%) falls under the age category of 18 – 70 years old. Since the aim of this study is to assess the effect of drug supply chain management on the level of patient/client satisfaction in community pharmacies of Addis Ababa. The targeted population comprises adults as well as Ethiopian of all gender, educational status, socio-economic status and residential areas, who requested pharmacy service in community pharmacies that are found in Addis Ababa.

3.5. Sample Design

The units of study are patients/clients of community pharmacy. The study conducted a judgmental sampling on patients/clients in thirty- one (31) pharmacies out of the total number of community pharmacies Addis Ababa (308). These thirty- one (31) pharmacies were chosen based on their distribution throughout the ten (10) sub cities of Addis Ababa. Moreover, some of the selected pharmacies are branches of chain pharmacies that are found in the city. Studying one of them can give a full picture about the situation in these chain pharmacies as they have one central main store for all. The other criteria required to select these thirty one (31) pharmacies is the area where the candidate pharmacy is found. To be selected, the pharmacy should be found in an area where there is high population density. As there is a high population density, it would help to address as much people as possible. Judgmental sampling will be used to select the respondents as they are more conversant with these practices and will give accurate and objective information. The sampling frames comprised patients/clients that were selected from the thirty-one (31) pharmacies in Addis Ababa. In addition to this, dispensers and pharmacy managers are asked about drug supply chain practices to use their response as a secondary supportive data. A representative sample of 385 from the population was selected by the use of formula. This is due that the respondents are large and dispersed all

over the city as well as their exact number is not known. According to Cochran, (1963) as cited by Israel, (2009), a large population's sample size can be calculated by using the formula:

$$N = \frac{z^2 \times p \times q}{e^2} = \frac{(1.96^2 \times (0.5) \times (0.5))}{(0.05)^2} = 384.5 \cong 385 \text{ respondents}$$

Where: P – Estimated proportions of an attribute

Q – (1 - p)

Z - 95% confidence interval (1.96)

E – Sampling error (5%)

The estimated sample size is determined to be a total of 385 respondents. Sekaran and Bougie, (2010) cited a sample size larger than 30 and less than 500 are suitable for most researches. Judgmental sampling will be used to select patients, dispensers and pharmacy managers that are going to participate in the study.

3.6. Data Collection

The study used primary data being collected through a structured questionnaire adapted from Logistical Indicator Assessment Tool (LIAT). A structured questionnaire adapted from Logistics Indicator Assessment Tool (LIAT), LIAT is a tool developed by the USAID-funded deliver which is used to conduct a facility-based survey to assess health commodity logistics system performance at community pharmacies and other health facilities (John Snow Inc./Deliver,2005).The structured questionnaire for patients focused on patients/clients satisfaction , the structured questionnaire for dispensers contained questions on availability of drugs whereas the structured questionnaire for the pharmacy heads contained questions on supply chain management practices.

This questionnaire for patients was divided in to two parts A and B. Part A obtained a demographic profile, part B discussed about issues on customer satisfaction. Concerning questionnaire for dispensers and pharmacy managers again divided in to four parts A, B, C and D. Part A obtained a demographic profile. Part B collected data on supply chain management dimensions. Part C collected on effects of supply chain management practice on patient satisfaction dimensions by assessing the selection, procurement, forecasting and distribution of drugs in each community pharmacies. Part D entailed the supply chain management practices

and service quality delivery challenges in community pharmacies in Addis Ababa. Questionnaire is fast way of obtaining data as compared to other instruments (Mugenda and Mugenda, 2003). The questionnaires were administered by the drop-off and pick-up later method. A five point non comparative Likert scale and a two point of the same scale were used for the respondents to read, understand and respond appropriately to the statements put across.

3.7. Research Area and Setting

Addis Ababa city, the capital city of Ethiopia covers an area of 540 km² and total population of 3 million. It is administratively sub divided in to 10 sub-cities (city government of Addis Ababa, 2012). The population of Addis Ababa in the year 2017 as per estimated data=6.6million (population of 2017 .com). Addis Ababa has a total of 308 pharmacies, 249 drug stores, 1 rural drug venders, 709 clinics, 140 importers and 93 whole sealers of human medicine. Six of the 11 pharmaceutical industries in Ethiopia are also found in Addis Ababa. (FMHACA, Google Scholars). From all pharmacies in Addis Ababa, thirty one (31) are selected to conduct the study, which are distributed throughout the ten sub cities of Addis Ababa city.

3.8. Data Collection Subjects and Participants

Quantitative data were collected by 2 data-collectors, who are junior pharmacists by profession, taken 5 each sub cities and cover the whole Addis Ababa. The data collectors used researcher administered- structured questionnaire, document review and structured observation methods. To explore the facilitators and barriers of the pharmaceutical supply chain system, in depth interview with the pharmacy heads of each community pharmacies were conducted by the student researcher along with a structured questionnaire.

3.9. Data Analysis and Presentation

Data collected was analyzed using descriptive and regression analysis. Both the general and specific objectives were analyzed using descriptive design to document supply chain management practices at the community pharmacies and the challenges faced in implementing the supply chain management practices to meet a high level of patient satisfaction.

3.10. Ethical Considerations

Before commencing data collection, ethical approval will be obtained from ethics review committee of the school of commerce, Addis Ababa University. Then the selected community pharmacies are communicated with formal letters from school of commerce, Addis Ababa University. The study will be conducted after obtaining permission from the head of respective community pharmacies. Participants of the study will be asked for consent before participating in the study. During the consent process, they will be provided with information regarding the purpose of the study, why and how they are selected to be involved in the study, and what will be expected of them and that they can withdraw from the study at any time. Participants will also be assured about confidentiality of the information in the course of the study by not using personal identifiers and analyzing the data in aggregates. If there is a need, personal interview might be conducted. Concerning the in –depth interviews, interviews will be recorded on digital voice recorder after interviewees gave informed consent. The name of the interviewees and community pharmacy in which they work will not appear in data analysis, and interviewees will be assured that the information they provide will only to be handled by the research team, and that it will not be discussed with the community pharmacy administrators or other participants of the study.

Chapter Four

Data Presentation and Analysis

4.1. Introduction

As discussed in previous chapter, this study attempted to examine the relationship between drug supply chain management practices and patient/client satisfaction in community pharmacies of Addis Ababa city. Therefore, the findings of community pharmacies are presented and discussed in this chapter. Some of the questionnaire were developed in five scales ranging from five to one; where 5 represents very high, 4 high, 3 average, 2 low, and 1 very low. Whereas the other was developed in nine scale ranging from nine to one. In order to assess the relationship between supply chain management practices and customer satisfaction, correlation and regression analysis were conducted for scale typed questionnaire. A total of 385 questionnaires were distributed to patients/clients and 31 each questionnaires were distributed to head pharmacists and dispensers as a supporting data. The collected data were presented and analyzed using SPSS (version 20) statistical software. The study used descriptive statistics and inferential statistics. Therefore, mean, standard deviation, correlation analysis, specifically Pearson correlation to measure the degree of association between different variables under consideration used. Regression analysis was also used to test the effect of independent variable on dependent variable.

4.2. Descriptive Statistics

4.2.1 Frequency Analysis of the Respondents' Profile

The demographic profile of the sample respondents is presented and analyzed below. The purpose of assessing respondents' age, sex, is that, to determine whether the researcher considered heterogeneity of sample units. On the other hand assessing the work experience and education level of the respondents' is that, when the respondents are more experienced and educated they have better opportunity to understand the case and give better response than else.

Table 4.1 Gender Frequency of Patients/Clients

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Male	169	43.90	65.50	65.50
	Female	89	23.11	34.50	100
	Total	258	67.01	100	
	Missing	127	32.99		
	Total	385	100.00		

(Source: researcher's survey)

Table 4.2 Gender Frequency of Head Pharmacists

		Frequency	Percent	Valid percent	Cumulative %
Valid	Male	19	61.29	61.29	61.29
	Female	12	38.71	38.71	100
	Total	31	100	100	
	Missing	0			
	Total	31			

(Source: researcher's survey)

Table 4.3 Gender Frequency of Dispensers

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Male	8	25.81	25.81	25.81
	Female	23	74.19	74.19	100
	Total	31	100	100	
	Missing	0			
	Total	31			

(Source: researcher's survey)

From the above tables (tabel4.1-4.3), gender frequency of the respondents, shows that the numbers of male patient/client respondents were 43.90% and that of female respondents were 23.11%. This is 169 of the respondents were male, while 89 were female respondents and one hundred twenty seven (127) respondents 32.99 % were invalid because these respondents did not clarify their sex. Gender frequency of head pharmacists is 61.29 %(19) and 38.71 %(8)

respectively. Whereas the gender frequency of dispensers is almost one to four, in which 8(25.81%) were male dispensers and 23(74.19%) female dispensers by chance.

As it has been indicated in tables 4.4 to 4.6 below, the researcher divided the age of the respondents in to three categories, starting from 18-30 years of age to above 40. In this study, out of 385 patients/clients, the researcher can conclude that 9.87% (38) of the respondents were above 40 ages, 19.74%(76) respondents falls between the age range of 31-40 and the rest of the group covers 37.40 % (144) of the respondents to the questionnaire. One hundred twenty seven (127) respondents 32.99 % were invalid because these respondents did not clarify their age. Concerning the age distribution of head pharmacists, 13(41.91%) pharmacists exist in the age range of 18 to 30, 2(6.45%) pharmacists in the age range of 31 to 40 and 16(51.61%) above age of 40. whereas the age distribution of dispensers, 18(58.07%) dispensers fall in the range of 18 to 30, 9(29.03%) in the range of 31 to 40, the remaining 4 dispensers fall in the range of above 40.

Table 4.4 Age Frequency of Patients/ Clients

		Frequency	Percent	Valid percent	Cumulative percent
Valid	18-30 years	144	37.40	55.81	55.81
	31-40 years	76	19.74	29.46	100
	Above 40 years	38	9.87	14.73	
	Total	258	67.01	100	
	Missing	127	32.99		
	Total	385	100		

(Source: researcher's survey)

Table 4.5 Age Frequency of Head Pharmacists

		Frequency	Percent	Valid percent	Cumulative percent
Valid	18-30 years	13	41.94	41.94	41.94
	31-40 years	2	6.45	6.45	6.45
	Above 40 years	16	51.61	51.61	51.61
	Total	31	100.00	100.00	100.00

(Source: researcher's survey)

Table 4.6 Age Frequency of Dispensers

		Frequency	Percent	Valid percent	Cumulative percent
Valid	18-30 years	18	58.07	58.07	58.07
	31-40 years	9	29.03	29.03	29.03
	Above 40 years	4	12.90	12.90	12.90
	Total	31	100.00	100.00	100.00

(Source: researcher's survey)

Table 4.7 Work Experience Frequency for Head Pharmacists

		Frequency	Percent	Valid percent	Cumulative percent
Valid	1-5 years	0	0	0	0
	6-10 years	5	16.13	16.13	16.13
	11-15 years	17	54.84	54.84	54.84
	Above15 years	9	29.03	29.03	29.03
	Total	31	100.00	100.00	100.00

(Source: researcher's survey)

Table 4.8 Work Experience Frequency for Dispensers

		Frequency	Percent	Valid percent	Cumulative percent
Valid	1-5 years	20	64.51	64.51	64.51
	6-10 years	9	29.03	29.03	29.03
	11-15 years	2	6.46	6.46	6.46
	Above15 years	0	0		0
	Total	31	100.00	100.00	100.00

(Source: researcher's survey)

As tables 4.7 and 4.8 above clearly shown the frequency distribution of respondents' work experience, the largest of head pharmacist respondents 54.84 % (17) have an experience from eleven (11) to fifteen (15) years. In the same case, 29.03% (9) of head pharmacist respondents have more than 15 years of work experience and followed by 6-10 years of experience, which accounts 16.13 (5) % and no respondent represents having 1-5 years of experience. This implies

that all of the head pharmacist respondents have more than 5 years of work experience with in the community pharmacies and it is sufficient to judge and give views. This is because when the respondents are more and more experienced within the organization they have better opportunity to know more and more about the organization. Concerning the work experience of dispensers working at the community pharmacies of Addis Ababa, 64.5 %(20) of dispensers have an experience of 1to 5 years followed by 29.03(9) having an experience of 6to10 years and 2(6.46) dispensers have 11 to 15 years of experience. There was no dispenser having an experience of more than 15 years.

Table 4.9 Educational Level Frequency for Head Pharmacists

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Below college diploma	0	0	0	0
	College diploma	0	0	0	0
	First degree	27	87.09	87.09	87.09
	Second degree & above	4	12.91	12.91	12.91
	Total	31	100.00	100.00	100.00

(Source: researcher's survey)

Table 4.10 Educational Level Frequency for Dispensers

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Below college diploma	0	0	0	0
	College diploma	31	31	31	31
	First degree	0	0	0	0
	Second degree & above	0	0	0	0
	Total	31	100	100	100

(Source: researcher's survey)

As shown above in table 4.9 and 4.10 the educational level of head pharmacists, 27(87.09%) of the pharmacists are first degree holders and the remaining 4(12.91%) have a second degree. All the dispensers (31,100%) are diploma holders.

4.2.2. Supply Chain Management Practices

This study focused on Addis Ababa community pharmacies' SCM practices from these three perspectives. For each practices different items were developed and measured based on their mean and group mean values.

4.2.2.1. Collaboration with Suppliers

In this part, the researcher tried to see the level of integration among community pharmacies of Addis Ababa city and their suppliers. Collaboration is the process of combining or coordinating separate functions, processes, or producers and enabling them to interact in a seamless and continuous manner (Kenneth and Brian 2006).

Table 4.11 Collaboration with Suppliers

S.N.	Items	N	Mean	Std. Dev.
1	The level of strategic partnership with suppliers	31	2.510	1.069
2	The establishment of quick ordering system	31	2.620	1.073
3	Stable procurement through network	31	2.750	1.076
4	The pharmacy seeks long-term stable relationship with suppliers	31	3.550	0.886
5	Regulatory solve problems jointly with our suppliers	31	3.100	1.035
6	Helped suppliers to improve their product quality	31	3.020	1.033
7	Included key suppliers in pharmacies' planning and goal setting activates	31	2.700	1.074
	Group mean		2.893	

(Source: researcher's survey)

As illustrate in table 4.12, there are seven items used to determine the extent of integration of the community pharmacies with their suppliers. Accordingly, relatively to other items the high mean value was scored on the community pharmacies seeks long-term stable relationship with suppliers which is 3.55, followed by regulatory solve problems jointly with our suppliers, 3.10.the mean value of helped suppliers to improve their product quality,3.02.furthermore the group mean shows that 2.893 mean value. The groups mean value approximately reveals as, moderate integration among community pharmacies and their suppliers. In addition to this, an interview was conducted with head pharmacists of the community pharmacies to consolidate the

information obtained through questionnaire. According to the interview response, community pharmacies' common supplier both in domestic and foreign cases and, the head pharmacists also point out that the suppliers of pharmaceutical products to the pharmacies has strong relation with the community pharmacies as the suppliers give incentives and promoting materials and supply products on time. Therefore, based on information obtained from both sources (qualitative and quantitative) the level of integration between the suppliers and the community pharmacies is medium.

4.2.2.2. Data Analysis Result of SCMP as collected from Pharmacy Heads

All (n=31) selected community pharmacies were included in this study. The pharmacy heads worked for 5 years or more in pharmacy. All of them reported that they do not purchase by generic name 31(100%).However, documented policy or guidelines for selection, forecasting, and procurement were available only in 9(29.03%), 6(19.36%), and 9 (29.03%) of the community pharmacies, respectively.

Table 4.12 Data Analysis Result of SCMP as collected from Pharmacy Heads in community pharmacies, Addis Ababa, 2018

Practices	No. of responses (n)	Frequency [Yes] N (%)
Documented policy or guideline for drug or other supply selection	31	9(29.03)
Selection of drug or other supply made by head pharmacist	31	31(100)
Documented policy or guideline for forecasting drug or other supply	31	6(19.36)
Documented policy or guideline for procurement of drug or other supply	31	9(29.03)
Purchase drug or other supply from private suppliers	31	31 (100)
Procurement made by brand name(not by generic name)	31	31 (100.0)

(Source: researcher's survey)

Purchase of drug or other supply from private suppliers was exercised in all the 31(100%) community pharmacies. All 31 (100%) of the community pharmacies reported Selection of drug or other supply made by head pharmacist.

4.2.2.3. Logistics Design

This study tried to investigate the practices of logistics design related to it and delivery systems among the supply chain participants of the community pharmacies. Accordingly, twelve items related to logistics design practice were used by the researcher.

Table 4.13 logistics design

S.N.	Items	N	Mean	Std. Dev
1	The level of IT-based automated ordering from prominent pharmacy customers	31	2.21	1.023
2	The level of IT-based automated ordering to suppliers	31	2.38	0.953
3	Up-to-datedness of IT technologies throughout the supply chain	31	2.20	1.062
4	Adequate investment are made in developing technology for SCM practices	31	2.88	0.994
5	SCM software systems (like LMIS) are used	31	2.16	1.040
6	The community pharmacies create compatible information system for supply chain members	31	2.36	1.100
7	Joint product delivery planning with suppliers	31	2.72	0.999
8	The level of cooperativeness with suppliers	31	3.10	0.840
9	Customer's service delivery adherence requirement	31	2.69	0.946
10	Compliance with customer's service delivery in full requirements	31	2.97	0.765
11	Compliance customer's service delivery on time requirements	31	2.76	0.914
12	Joint service delivery planning with major customers	31	2.69	0.946
	Group Mean		2.59	

(Source: researcher's survey)

From the above table, in the first section, there are items of IT development in the community pharmacies' logistics design practices. The adequate investment is made in developing of it throughout the SC represent mean value of 2.88. On the other hand, the mean value of up-to-datedness of it throughout the supply chain, IT-based automated ordering from prominent pharmacy customers , IT-based automated ordering to major suppliers, SCM software are used and pharmacies create compatible IS for SC members revealed that 2.10, 2.21 , 2.38,2.16 and 2.36 mean value respectively. Generally, even if there is adequate investment are made through the SC, the mean values of SCM practice from it perspective interpreted as there is poor IT application practice across the community pharmacies' supply chain. Turban, McLean& Wetherbe, (2004), illustrates as, good experience in information technology have a positive effect on the firm's ability to enhance customer satisfaction and supply chain responsiveness. In addition to the data collected through questionnaire, interview was held with the head pharmacists as well as the dispenser pharmacists of the community pharmacies. According to the interview there are enhanced information technology facilities within the community pharmacies. But, there is no practices done on the technology through supply chain integration.

Now a day, the community pharmacies are implementing intra-network connection facilities to connect dispensary, store and administration department. According to Levi *et al.*,(2003) the objectives of it in SCM are; to provide the information availability and visibility to supply chain partners, to enable the collaboration with organizations in the supply chain and to allow the decision making based on the total supply chain information. Currently, many pharmaceutical companies are using integrated information systems to manage their business activities. To share information there should be an up-to dated IT and integrated information system which is capable of connecting all functional units of the pharmaceutical sector and its external participants. Based on the data collected both in questionnaire and interview and the analysis made on the practices, the existing it system of the community pharmacies supply chain cannot support effective SCM implementation. Therefore, based on the mean value of each items and interviews, the SCM practice of IT in the community pharmacies of Addis Ababa is poor and conveys that a lot has to be done to bring about change in the IT system.

In the second section, logistics design practices regards to cooperativeness and delivery system items were analyzed. Joint product planning with customers, level of cooperativeness with

suppliers and compliance with customer's service delivery in full-requirement scores the mean value with 3.10, 2.88 and 2.97. So, from these values, the community pharmacies practices are good regards to cooperativeness with supplies and joint product planning and full requirement with customer's service delivery. Joint product planning with suppliers, customer's service delivery adherence requirement and compliance with customer's service delivery on time also reveals a mean value 2.72, 2.69 and 2.76. Those values also reveal that community pharmacies interaction with suppliers in product planning and customer service delivery requirement on time were moderate. But these findings were completely different from the respondents of community pharmacies customers with regards to delivery requirements and compliance with customer's service delivery on time.

4.2.2.4. Customer Satisfaction

The ultimate goal of an integrated, efficient and effective SC system is superior customer service: short lead-time, quick response to requirements, accurate delivery, product accessibility, risk sharing, complaints handling etc. (Christopher 1998; Kenneth 2006; Russell 2006; and Eyong 2009). SCM suggests that firms need to integrate with their suppliers and customers to achieve both financial and non-financial growth objectives (Tan, 2001).

Table 4.14 Community Pharmacies Integration with Customers

S.N.	Items	N	Mean	Std. Dev.
1	Follow-up customers for feedback	31	2.430	1.009
2	Monitoring and measuring customer service level	31	2.270	1.047
3	The level of information sharing with prominent pharmacy customers	31	2.630	1.008
4	Customer feedback is used to improve customer relations, processes, products and services	31	2.560	1.084
5	The pharmacy has systematic processes for handling customer complaints	31	2.260	1.021
	Group mean		2.430	

(Source: Researcher's Survey)

As table 4.14 above depicts, five items were used to evaluate the case of community pharmacies integration with its customers or downstream of the SC. Accordingly, the item that pharmacies have systematic processes for handling customer complaints, monitoring and measuring customer service level and follow up customer feedback scored mean value of 2.26, 2.27 and 2.43 respectively, which is approximates to bad level of integration. Customer feedback is used to improve customer relations, processes, products and services and the level of information sharing with prominent customers indicates mean value of, 2.56, and 2.63 respectively which shows medium level of collaboration. This implies that community pharmacies are in a bad position to pay attention for measuring the extent of customers' service level and to make an improvement to satisfy their customers. On the other hand, the customer response on this related items, shows in the table 4.14. According to their response, the community pharmacies solving the problem of customers scored mean value of 2.29 and their understanding on the specific needs of the customers is also scores mean value of 2.16. This shows that the customers are not satisfied on the community pharmacies measurement and monitoring of customer service level. In addition the community pharmacies staff politeness, information delivery and willingness to help customer shows a mean score of 2.44, 2.40 and 2.38 which shows that the staffs are in a bad position of integration with their customers. Furthermore, variables of tangibility like physical facilities are virtually appealing, adequate product service delivery system and the pharmacies dispensing area is comfortable and conducive to perform the service desired right the first time showed a mean value of 2.45, 2.26, and 2.39 respectively. As the dispensary pharmacists responded that, there is improvement on the follow-up of customers for feedback, like different researches which have been done on customer satisfaction by many researchers in the health sector. By the studies done, community pharmacies has been doing a lot of improvement on the drug dispensing structure as well as gave a solutions on the problems raised by customer in the dispensary area of the community pharmacies.

Table 4.15 Customer Satisfaction Measurements

S.N.	Items	N	Mean	Std. Dev
1	Employees are polite to customers (assurance).	385	2.440	0.910
2	Staff makes information easily obtainable by customers (reliability).	385	2.400	0.753
3	Staff is always willing to help customers (responsiveness).	385	2.380	0.896
4	When customer has a problem; they show sincere interest in solving the problem (assurance).	385	2.290	0.839
5	Employees of the community pharmacies understand the specific needs of their customers (empathy).	385	2.160	0.809
6	Physical facilities are virtually appealing (tangibles)	385	2.450	0.907
7	Adequate product service delivery system (tangibles)	385	2.260	0.836
8	The pharmacies dispensary area is comfortable and conducive to perform the service desired right the first time(tangibles)	385	2.390	0.852
	Group mean		2.346	

(Source: Researcher's Survey)

Therefore, the total implication of the community pharmacies integration with their customers is poor. This will leads to the dissatisfaction of their customers and in a long-run there may be a chance of losing their customers. If it is so, it may be difficult and dangerous to these community pharmacies to survive and compete in this intensive and competitive market environment.

4.3. Inferential Statistics for SCM Practices and Customer Satisfaction

4.3.1. Correlation Analysis

Correlations are the measure of the linear relationship between two variables. A correlation coefficient has a value ranging from -1 to 1. Values that are closer to the absolute value of 1 indicate that there is a strong relationship between the variables being correlated whereas values closer to 0 indicates that there is little or no linear relationship. As described by Andy (2006), the

correlation is a commonly used measure of the size of an effect: values of ± 0.1 represent a small effect, ± 0.3 is a medium effect and ± 0.5 is a large effect. In this section, correlation analysis conducted in the light of each research objectives and hypotheses developed. The relationship between supply chain management practices and firm performance was investigated using correlation analysis. This provided correlation coefficients which indicated the strength and direction of relationship. The p-value also indicated the probability of this relationship's significance.

4.3.1.1. Correlation Analysis between Construct of SCM Practices and Customer Satisfaction

Table 4.16: Correlation Matrix Between Constructs of SCMP and CP

		Collaboration	Information sharing	Logistics design	Customer satisfaction
Collaboration	Pearson correlation	1	.716**	.562**	.778**
	Sig. (2-tailed)		.000	.000	.000
	N	31	31	31	31
	Pearson correlation	.716**	1	.807**	.840
Information sharing	Sig. (2-tailed)	.000		.000	.000
	N	31	31	31	31
	Pearson correlation	.562**	.807**	1	.609**
Logistics design	Sig. (2-tailed)	.000	.000		.001
	N	31	31	31	31
	Pearson correlation	.778**	.840**	.609**	1
Customer satisfaction	Sig. (2-tailed)	.000	.000	.001	
	N	31	31	31	31

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

(Source: researcher's survey)

The correlation between constructs of SCM practices with customer satisfaction was run as seen in the above table. The result of correlation matrix between each constructs and customer satisfaction is analyzed as follow: as it is indicated in the table, there is significant positive correlation between collaboration and customer satisfaction with correlation coefficient of 0.778 ($r=0.778$) and significance less than 0.001. Therefore, collaboration and customer satisfaction are genuinely correlated. Table 4.18, also depict that as there is strong positive relationship between information sharing and customer satisfaction with a Pearson correlation coefficient of 0.840. ($r=0.840$) and significance value is less than 0.001. This significance tells that there is genuine relationship between information sharing and customer relationship.

As the conducted Pearson correlation test indicated in the table 4.18, also there is significant positive correlation between level of logistics design and customer satisfaction. In other words, logistics design and customer satisfaction are correlated in high relationship ($r=0.516$) with level of significance less than 0.001.

4.3.1.2. Correlation between SCM Practices and Customer Satisfaction

Pearson correlation test was conducted between SCM practices (collective representative of three constructs of SCM practices). the results are shown in table 4.19. As per the table, there is significantly strong correlation between SCM practices and customer satisfaction. In other words SCM practices and customer satisfaction have strong positive relationship with correlation coefficient of 0.745($r=0.745$) and significance value less than 0.01.

Table 4.17: Correlation between SCMP and CS

		SCM practices	Customer Satisfaction
	Pearson correlation	1	.745**
SCM practices	Sig. (2-tailed)		.000
	N	31	31
	Pearson correlation	.745**	1
Customer satisfaction	Sig. (2-tailed)	.000	
	N	31	31

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

(Source: researcher's survey)

4.3.2. Regression Analysis

This regression analysis is conducted to know by how much the independent variable explains the dependent variable. The regression was conducted between collaboration (independent variable) and customer satisfaction (dependent variable) in the first regression. The second regression was made between information sharing (independent variable) and customer satisfaction (dependent variable). Finally, the third regression was made between logistics design (independent variable) and customer satisfaction (dependent variable). The results of the regression analysis are presented as follows.

4.3.2.1. Regression Analysis between Collaboration and Customer Satisfaction

Table 4.18: Regression Analysis between Collaboration and Customer Satisfaction

Model	B	T-stat	Std. Error	P-value	R	R square	Adjusted R square
1	.863	8.88	.625	.000	.874	0.764	.848

Predictor: collaboration

Dependent variable: customer satisfaction

(Source: researcher's survey)

The model summary provides the correlation coefficient and coefficient of determination (r^2) for the regression model. As we have already seen a coefficient of $.874 = r$ suggests there is a strong positive relationship between collaboration and customer satisfaction while adjusted $r^2 = .848$ suggests that 84.8% of the variance in collaboration can be explained by customer satisfaction. Although there might be many factors that can explain the variable on customer satisfaction, nearly 84.8% of it is explained by collaboration practice. This means that the remaining 15.20% of the variation is cannot be explained by those dimensions of collaboration. The p value and positive β coefficient also implies that collaboration have a positive and significant influence on customer satisfaction.

4.3.2.2. Regression Analysis between Information Sharing and Customer Satisfaction

Table 4.19 Regression Analysis Between IS And CS

Model	B	T-stat	Std. Error	P-value	R	R square	Adjusted R square
1	.846	7.18	.565	.000	.742	.551	.736

(Source: researcher's survey)

The correlation between constructs of information sharing and customer satisfaction was run as seen in the above table. As it is indicated in the table, there is significant positive correlation between information sharing and customer satisfaction with correlation coefficient of 0.742 ($r=0.742$) and significance less than 0.001. Therefore, information sharing and customer satisfaction are genuinely correlated. In addition, the summary provides the correlation coefficient and coefficient of determination (r^2) for the regression model. As we have already seen a coefficient of $.742 = r$ suggests there is a strong positive relationship between information sharing and customer satisfaction while adjusted $r^2 = .736$ suggests that 73.6% of the variance in information sharing can be explained by customer satisfaction.

4.3.2.3. Regression Analysis between Logistics Design and Customer Satisfaction

Table 4.20 Regression Analysis between LD and Cs

Model	B	T-Stat	Std. Error	P-value	R	R square	Adjusted R square
1	.846	6.81	.900	.000	.692	.479	.681

(Source: researcher's survey)

The correlation between constructs of logistics design and customer satisfaction was run as seen in the above table. As it is indicated in the table, there is significant positive correlation between logistics design and customer satisfaction with correlation coefficient of 0.692 ($r=0.692$) and significance less than 0.001. Therefore, logistics design and customer satisfaction is genuinely correlated. In addition, the summary provides the correlation coefficient and coefficient of

determination (r^2) for the regression model. As we have already seen a coefficient of $.681 = r$ suggests there is a strong positive relationship between logistics design and customer satisfaction while adjusted $r^2 = .681$ suggests that 68.10% of the variance in logistics design can be explained by customer satisfaction.

4.4. Discussion

The ultimate goal of the pharmaceutical supply chain management is to ensure pharmaceutical accessibility to the end users. To achieve this, the system should be monitored frequently, so that limitations, barriers, strengths and facilitators of the system are identified. The findings of this study focused on effects of pharmaceutical supply chain management and patient satisfaction on community pharmacies of Addis Ababa. Regarding selection, this study documented that almost all of the community pharmacies had no essential drug list, and in most community pharmacies selection of drugs was made by head Pharmacists which is in line with the standard (FMHACA, 2011). However, the in depth interview in the present study revealed that weakness of head Pharmacists was a barrier for good selection practice.

The finding from the in-depth interview of the head Pharmacists explained that PFSA did not always supply drugs according to the demand of the community pharmacies. Moreover, the community pharmacies themselves may order a quantity less than they demand because of the short expiry of the drugs at PFSA. Moreover, if PFSA able to serve health facilities according to some specified schedules, the pressure on PFSA staff can be reduced and hence can provide better quality service. Overall, this study revealed that the availability of drug in community pharmacies needs improvement, which can be achieved by promoting the facilitators and resolving the barriers for availability of drugs identified in this study.

In the current competitive market of pharmaceutical supply chain, empathy with customers is of great importance; without it, a good interaction cannot be achieved. The community pharmacies should try to establish the atmosphere of mutual understanding and trust. According to view of respondent, assurance was the second most important factor. The community pharmacies should select and train motivated people.

Chapter Five

Summary of Major Findings, Conclusion and Recommendations

5.1. Summary of Findings

The purpose of this study was to examine the effect of drug supply chain management and how it affects customer satisfaction in community pharmacies. The community pharmacies' orientation of SC was evaluated through three SCM practices and five types of measurements that determine customer satisfaction. In addition, the impact of SCM orientation was examined through customer service level which is the ultimate goal of an effectively managed supply chain. Based on the quantitative and qualitative data analysis, discussion of results with respect to the basic questions, the following are the summary of major findings of this study.

The degree of relationship across the supply chain of community pharmacies has shown less integration with customer. So, there should be an independent decision making across the downstream side of the SC. The descriptive analysis and interview with pharmacy heads has verified the prevalence of these characters of relationship. Regarding to integration among the SC partners the mean of community pharmacies integration with its supplier's conveys group mean value of 2.893 and this shows the integration is in moderate level. But, the quantitative analysis of customers' integration conveys group mean value of 2.388 and it is really poor. For instance, low score is the range between 1.0 and 2.4, medium between 2.5 and 3.4 whereas high is between 3.5 and 5 (Oxford and Burry-stock, 1995).

With regard to information sharing, the descriptive data and interview analysis conveys that, there is poor information sharing with customer, moderate related to suppliers. Again the overall efforts in coordinating and sharing information across the supply chain partners are weak. Even the shared information lacks adequacy and quality. Concerning information technology as one of logistics design, the quantitative and qualitative analysis indicated that, poor and absence of IT & IS tools with in the community pharmacies. This study is also intended to test if there is a relationship between SCM practices, and customer satisfaction. Based on the results of the study the summary of major findings are as follows. The test result indicates that collaboration practice

has positive and strong correlation ($r=0.874$) with customer satisfaction at significance level of 0.001. In other way, collaboration has also contributed 84.4% for the variability of customer satisfaction. On the other hand, the test result of information sharing and customer satisfaction indicates that information sharing has significant positive correlation ($r=0.742$) at significance level of 0.001 with customer satisfaction. In addition, 73.6% of variability of customer satisfaction explained by information sharing. Finally, the test result of logistics design and customer satisfaction indicates that logistics design is positively correlated to customer satisfaction with correlation coefficient of 0.692 ($r=0.692$) and the significance value is of 0.001.

5.2. Conclusions

Based on the results of the study obtained and summary of findings the following conclusions are given. The eventual conclusion of this study is that generally, the community pharmacies' orientation towards SCM is traditional that lacks substantial indicators of an integrated, efficient and effective SCM. In addition, the quantitative analysis of the community pharmacies' customer satisfaction group mean is low that is 2.346. Therefore, this can't ensure customer satisfaction with respect to indicators taken. Based on qualitative and quantitative analysis the investigator comes up with conclusion that the community pharmacies' orientation towards customer satisfaction is poor and SCM practices have direct impact on customers' satisfaction. The primary reason mentioned for poor level of customer service is pharmacies integration with suppliers that have direct effect on the community pharmacies' ability (potential) to embark on external integration. In other words, its effect is clearly reflected on customers not getting what they need when they need it, long lead time, and poor complaints management, not having effective flexible drug/goods supply system that could respond to the changing market and customer's preference.

5.3 Recommendations

The management of community pharmacies of Addis Ababa city need to understand how their customers rate the service quality, what critical dimensions contribute to improving the service quality; would have ultimately satisfy customers based on the customer satisfaction level. Therefore, the community pharmacies should be equipped with highly qualified and dedicated personnel and establish qualitative working systems that pay attention to its customers to maintain a conducive and higher level of customer satisfaction. Head pharmacist of the community pharmacies and dispensary pharmacists in particular can use the findings of this study to identify the most important dimensions which contribute much in quality service to their customers. In relation to the finding, the researcher came up with the following recommendations.

1. PFSA should improve its supply not only for government owned pharmacies but also for community pharmacies in general.
2. Adequate budget should be allocated for procurement of drugs and medical supplies so that to reduce unavailability of drugs from the market.
3. A strategy that minimize the lead time when drugs procured from private suppliers
Should be devised
4. Priority should be given to pharmacies with high patient flow in resupplying drugs that are currently out of market
5. Communication among community pharmacies, whole sales, pharmaceutical imports and other suppliers should be improved

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Appendices

Annex 1. Questionnaire to Pharmacy Head of Community Pharmacies

Effect of Drug Supply Chain Management on the Level of Patient /Client

Satisfaction in Community Pharmacies:

The Case of Addis Ababa Ethiopia

Questionnaire for Community Pharmacies in Addis Ababa

May 2018

Respondents Profile

1. Sex: ☐Male ☐ Female

2. Age: ☐20-25 years

☐ 26-30 years

☐ 31-35 years

☐36- 40 years

☐Above 40 years

3. Educational Qualification:

☐Grade 10 completed ☐ Grade 12 completed ☐ Certificate

☐College diploma ☐ First Degree

I. Verbal consent form before administering the questionnaire to the pharmacy head

“Good day to you. My name is Abiy Abreham. I am a student of Logistics and Supply Chain Management MSC program in School of Commerce, Addis Ababa University. I am here to collect data about the drug supply chain management system of your facility that is needed for my thesis titled:

Effect of drug supply chain Management on the level of Patient Satisfaction in Community Pharmacies: The Case of Addis Ababa, Ethiopia. This survey is done in all 31(thirty one) selected community Pharmacies of Addis Ababa, Ethiopia. Your facility is selected because it is one of them. The research will provide an empirical snap shot of the current pharmaceutical

supply chain management in relation to patient satisfaction at community pharmacy level in Addis Ababa and provide baseline information to track changes and improvements in pharmaceutical supply chain performance overview I would like to ask you few questions about selection, acquisition, procurement of drugs and the pharmaceutical stock management. The interview will take 15-20 minutes of your time.

Your participation is completely voluntary. You can refuse to answer any questions and/or withdraw from the study at any time. All of the information collected is strictly confidential. No one other than the research team will have access to your responses. Your personal identifiers such as your name and that of individual facilities in the report, but rather will describe the overall picture of all facilities. Do I have your permission?

Yes ☐ No ☐ If yes, continue

II. Facility Identification

Health Facility Code: _____

Interviewer: Abiy Abreham

Date of Interview: _____

How long you have worked as a pharmacy head _____

III. Questioner related to supply chain management practices

SN	Description	Yes	No	Remarks	Comments
3.1	Is there any documented policy or guiding for drug selection?				
3.2	Does the pharmacy have its own standard quantification method for each and every drug?				
3.3	Does the pharmacy have its own essential drug list?			If Yes skip 3.7 and 3.8 If No, skip Q 3.7 & 3.16	
3.4	Do you revise it annually?			If No. write the duration and reason	
3.5	Does the Head Pharmacist do the			If No. write the one who does	

	selection, quantification, procurement and distribution?				
3.6	Do you use Cost of the drugs or preference of well-known drugs as the criteria for drug selection in the Pharmacy?			If No, mention the criteria	
3.7	Is there a nation essential drugs list available in the health center?			If No, skip Q 3.10 and 3.16	
3.8	Do you use National Drug Formulary?			If No, mention	
3.9	Are wholesalers your major customers to purchase drugs?			If No, mention	
3.10	Is there any document policy or guideline for procurement of Drugs?				
3.11	Is there any document policy or guideline for drug forecasting?				
3.12	Do you conduct VEN analysis?				
3.13	Is Consumption method of quantification employed?			If No, mention	
3.14	Do you conduct ABC analysis?				
3.15	Are facility's resupply quantities determined by Formula?			If No, mention	
3.16	Is the procurement limited to the essential drugs list?			Skip this question, if the answer for Q3.3 & 3.7 is No.	
3.17	do you get monthly supply from PFSA?			If No, mention	
3.18	Is procurement made by generic name?			If No, mention	
3.19	Is monthly purchasing pattern usually used?			If No, mention	
3.20	Do you often purchase drugs from private supplies?			If No, mention	

3.21	Is PFSA responsible for transporting drugs to your facility when drugs are purchased from PFSA?			If No, mention	
3.22	Is the supplier responsible for transporting drugs to your facility when drugs are purchased from private suppliers?			If No, mention	
3.23	Is procurement facility type vehicle most often used for transporting drugs?			If No, mention	
3.24	Does ordering and receiving drugs from PFSA takes less than one week on average?			If No, mention	
3.25	Does ordering and receiving drugs from private suppliers takes less than one week on average?			Skip this question if the answer for Q20 was No? If No, mention	

IV. Supply Chain Efficiency

SN	Description	Yes	No	Remarks	Comments
4.1	Is there a deficiency in selection, quantification and storage of dregs in your pharmacy?				
4.2	Are there high price /price fluctuation of some drugs through short period of time?				
4.3	If your answer is Yes for Q 4.2, do you think is the reason is lack of foreign currency?			If No, mention	
4.4	Do you encounter poor quality product?			If yes how often do you get this?	
4.5	Do you encounter any theft in your			If so, from who?	

	pharmacy?				
4.6	Do you encounter expiration of drugs?			If Yes, how often?	
4.7	Do you face irrational prescribing?			If Yes, how often?	
4.8	Have you encounter incorrect use of medicines by patients?			If so, how many times?	
4.9	do you check the stock level of essential drugs?			If Yes, how often?	
4.10	Do you check the stock level of program drugs?			If Yes, how often?	
4.11	Do you check the stock level of non-program drugs?			If Yes, how often?	
4.12.	Did you get any certification from governmental or non-governmental organization that owner your service quality?				

Annex 2. Questionnaire for Dispensers of Community Pharmacies

Effect of Drug Supply Chain Management on the Level of Patient/Client satisfaction In

Community Pharmacies:

The Case of Addis Ababa, Ethiopia

Respondents Profile

1. Sex: ☐Male ☐ Female

2. Age: ☐20-25 years

☐ 26-30 years

☐ 31-35 years

☐36- 40 years

☐Above 40 years

3. Educational Qualification:

☐Grade 10 completed ☐ Grade 12 completed ☐ Certificate

☐College diploma ☐ First Degree

I. Verbal consent form before administering the questionnaire to dispensing personnel.

“Good day. My name is _____ I am working with the research team of the Department of Logistics and Supply Chain Management, School of Commerce, Addis Ababa University. I am here to collect data about the pharmaceutical supply chain management and its effect on the level of patient/ client satisfaction in your facility that is needed for the Master’s Thesis titled “Effect of Drug Supply Chain Management on the level of patient /client satisfaction In Community Pharmacies: The case of Addis Ababa, Ethiopia.”

This survey is done in all selected 31(thirty one) community pharmacies in Addis Ababa. Your facility is selected because it is one of them. The research will provide an empirical snapshot of the current pharmaceutical supply chain situation related to the level of patient satisfaction at a community pharmacy level in Addis Ababa and provide baseline information to track changes and improvements in pharmaceutical supply chain system performance with respect to the level of patient satisfaction over time.

I would like to ask you few questions about availability of drugs and the functioning of pharmaceutical supply chain system. The interview will take 10-15 minutes of your time. Your

participation is completely voluntary. You can refuse to answer any questions and/or withdraw from the study at any time. All the information collected is strictly confidential. No one other than the research team will have access to your responses. Your personal identifiers such as your name and that of your health facility will not be used. The principal investigator will not refer to individual respondents or individual facilities in the report, but rather will be described the overall picture of all facilities.

Do I have permission?

Yes-----

No----- If yes, continue

For comments/questions please contact Abiy Abreham (0960066869), Student Researcher

Facility Identifications

Health facility code_____

Interviewer_____

Date of Interview_____

How long you have worked as a dispenser_____

Part II. Profile for Supply Chain Management Practices

Using the following Rating Scales under the columns, “circle only on one number from the given numbers in the box after reading the variable on the left hand.”

The numbers represent: 1-Very Low, 2-Low, 3Average, 4-High and 5 –Very high

S/N	Variables	Rating Numbers				
A	Supply chain collaboration	Strongly disagree	Disagree	Don't know	Agree	Strongly agree
A1	Community pharmacies' integration with suppliers					
1	The level of strategic partnership with suppliers	1	2	3	4	5
2	The establishment of quick ordering system	1	2	3	4	5
3	Stable procurement through network	1	2	3	4	5

4	The community pharmacy seeks long-term stable relationships with suppliers	1	2	3	4	5
5	The pharmacy heads solve problems jointly with their suppliers	1	2	3	4	5
6	Helped suppliers to improve their product quality	1	2	3	4	5
7	Included our key suppliers in community pharmacies' planning and goal setting activities	1	2	3	4	5
A2	Community pharmacies' Integration with Customers					
8	Follow-up customers for feedback	1	2	3	4	5
9	Monitoring and measuring customer service level	1	2	3	4	5
10	The level of market information sharing with major customers	1	2	3	4	5
11	Customer feedback is used to improve customer relations, processes, products and services	1	2	3	4	5
12	The organization has systematic processes for handling customer complaints	1	2	3	4	5
B	Information Sharing Practices					
13	Sales forecast information sharing with customers	1	2	3	4	5
14	Sales forecast information sharing with suppliers	1	2	3	4	5
15	Adequacy and quality of information sharing throughout the supply chain	1	2	3	4	5
16	Overall efforts of Inter-organizational	1	2	3	4	5

	information coordination and sharing					
17	Sense of trust and confidence along the supply chain	1	2	3	4	5
C	Logistics design practices					
18	The level of IT-based automated ordering to major suppliers	1	2	3	4	5
19	Up to datedness of IT technologies throughout the supply chain	1	2	3	4	5
20	Adequate investment are made in developing technology for SCM practices	1	2	3	4	5
21	SCM software systems (like LIAT) are used	1	2	3	4	5
22	The community pharmacy creates compatible Information system for supply chain members	1	2	3	4	5
23	Joint product planning with suppliers	1	2	3	4	5
24	The level of cooperativeness with suppliers	1	2	3	4	5
25	Customer service delivery adherence requirement	1	2	3	4	5
26	Compliance with customer service delivery in-full requirements	1	2	3	4	5
27	Compliance customer service delivery on time requirements	1	2	3	4	5
28	Joint product planning with major customers	1	2	3	4	5

Annex 3: Questionnaire for Patients/Clients

(English Version)

I. Verbal consent form before administering the questionnaire to patients/clients.

“Good day. My name is _____ I am working with the research team of the Department of Logistics and Supply Chain Management, School of Commerce, Addis Ababa University. I am here to collect data about the pharmaceutical supply chain management and its effect on the level of patient/client satisfaction in your facility that is needed for the Master’s Thesis titled “Effect of Drug Supply Chain Management on the level of patient/client satisfaction In Community Pharmacies: The case of Addis Ababa, Ethiopia.”

This survey is done in all selected 31(thirty one) community pharmacies in Addis Ababa. This facility is selected because it is one of them. The research will provide an empirical snapshot of the current pharmaceutical supply chain situation related to the level of patient satisfaction at a community pharmacy level in Addis Ababa and provide baseline information to track changes and improvements in pharmaceutical supply chain system performance with respect to the level of patient satisfaction over time.

I would like to ask you few questions about availability of drugs and the functioning of pharmaceutical supply chain system.

Your participation is completely voluntary. You can refuse to answer any questions and/or withdraw from the study at any time. All the information collected is strictly confidential. No one other than the research team will have access to your responses. Your personal identifiers such as your name and others will not be used. The principal investigator will not refer to individual respondents or individual facilities in the report, but rather will be described the overall picture of all facilities. Do I have permission?

Yes-----

No----- If yes, continue

Respondents Profile

1. Sex: ☐Male ☐ Female

2. Age: ☐20-25 years

☐ 26-30 years

☐ 31-35 years

☐ 36- 40 years

☐ Above 40 years

3. Educational Qualification:

☐ Grade 10 completed ☐ Grade 12 completed ☐ Certificate

☐ College diploma ☐ First Degree

4. How long have you been purchasing medicine, other product and use pharmaceutical services?

☐ less than 6 months ☐ 6 months to less than a year ☐ 1 year to less than 3 years ☐ 3 years to less than 5 years ☐ 5 years or more

For comments/questions please contact Abiy Abreham (0960066869), Student researcher

II. Facility Identifications

Health facility code_____

Interviewer_____

Date of Interview_____

Part II. Customer satisfaction indicators

Using the following Rating Scales under the columns, “circle only on one number from the given numbers in the box after reading the variable on the left hand.”

The numbers represent: 1-Complitley unsatisfactory, 2-low satisfaction, 3-Average satisfaction, 4-High satisfaction and 5 –Very satisfactory

S/N	Variables	Rating Numbers				
A	Customer satisfaction items	Completely unsatisfactory	Low satisfaction	Average satisfaction	High satisfaction	Very high satisfaction
	Tangibility					
1	The community pharmacy has modern equipment(computer, air conditioning, etc)	1	2	3	4	5

2	The Physical facilities at community pharmacy are virtually clean	1	2	3	4	5
3	Personnel handling drugs/other supply are professional in appearance	1	2	3	4	5
4	Physical Environment of the community pharmacy are enough for dispensing	1	2	3	4	5
	Responsiveness					
5	Personnel handling drugs/other supply responds immediately to your enquiries	1	2	3	4	5
6	Personnel handling drugs/other supply responds immediately to your complaints	1	2	3	4	5
7	When Personnel handling drugs/other supply promises to deliver items that are not available currently by certain time ,they do so	1	2	3	4	5
8	Staff are never too busy to respond to customer requests	1	2	3	4	5
	Reliability					
9	Temperature and Humidity are controlled in the pharmacy(no suffocation)	1	2	3	4	5
10	When you have a problem; Personnel handling drug/other supply show sincere interest in solving the problem	1	2	3	4	5
11	The Personnel handling drugs/other supply performs proper packing of items after dispensing	1	2	3	4	5

12	The packed item from pharmacy contain correct item	1	2	3	4	5
13	The packed item from pharmacy contain incorrect quantity	1	2	3	4	5
	Assurance					
14	The personnel at the community pharmacy are trained	1	2	3	4	5
15	Prescription/oral order taking methods (including frequency) are accurate	1	2	3	4	5
16	Prescription/oral order responding methods (including frequency) are accurate	1	2	3	4	5
17	The personnel at the community pharmacy are courteous with you	1	2	3	4	5
	Empathy					
18	Personnel handling drugs/other supply responds immediately to your enquiries at emergency order	1	2	3	4	5
19	Operating hours of the community pharmacy are convenient to customers	1	2	3	4	5
20	Employees of the community pharmacy give customers (individual) attention	1	2	3	4	5
21	Methods designed for payments are convenient to you	1	2	3	4	5
22	Employees of the community pharmacies fulfills the specific needs of their customers	1	2	3	4	5

Annex 4: Interview Guide (Amharic Version)

የተሳታፊዎች ቅፅ

1. ፆታ: ☐ ወንድ ☐ ሴት

2. ዕድሜ: ☐ 20-25 ዓመት

☐ 26-30 ዓመት

☐ 31-35 ዓመት

☐ 36- 40 ዓመት

☐ ከ 40 ዓመት በላይ

3. የትምህርት ደረጃ:-

☐ 10ኛ ክፍል ያጠናቀቁ ☐ 12ኛ ክፍል ያጠናቀቁ ☐ ሰርተፊኬት

☐ የኮሌጅ ዲፕሎማ ☐ የመጀመሪያ ዲግሪ

4. በምን ያህል ጊዜ መድሀኒት/ሌሎች ዕቃዎችን ይገዛሉ ወይም መድሀኒት ነክ አገልግሎቶችን ከመደሀኒት ቤት ይጠቀማሉ?

☐ ከ 6 ወራት ባነሰ ጊዜ ☐ ከ6 ወራት እስከ 1 ዓመት ☐ ከ1 ዓመት እስከ 3 ዓመት ☐ ከ3 ዓመት እስከ 5 ዓመት ☐ ከ5 ዓመት በላይ

አዲስ አበባ ዩኒቨርሲቲ ንግድ ሥራ ኮሌጅ

የሎጀስቲክስና ሰጥላይስ ጅይን የት/ክፍል

በአዲስ አበባ ከተማ ውስጥ በሚገኙት የሕዝብ መድኃኒት ቤቶች ላይ ያለውን የመድኃኒት አቅርቦትና አጠቃላይ የአገልግሎት ሁኔታን በተመለከተ ከተጠቃሚዎች ጋር ለሚደረግ ቃለ-መጠይቅ የተዘጋጀ መመሪያ፡፡

1. በቃለ-መጠይቁ ለመሳተፍ የፈቃደኝነት መጠየቂያ ቅጽ፤

በመድኃኒት አስተዳደርና አጠቃላይ በመድኃኒት አገልግሎት ላይ ያሉ ጠንካራ ጎኖችንና አበረታች ነገሮችን መለየት እንዲሁም የሚያጋጥሙ ውስንነቶችና መሰናከሎችን መለየት ለሕብረተሰቡ የመድኃኒት ተደራሽነትን ለማሻሻል ለሚደረጉ ጥረቶች ከፍተኛ አስተዋጽኦ እንደሚኖረው ይታወቃል፡፡ በመሆኑም በሕዝብ መድኃኒት ቤቶች ውስጥ ያለውን የመድኃኒት አስተዳደር ሁኔታ በሚመለከት ያሉትን የግል አስተያየት በግልጽ እንዲነግሩን በአክብሮት እንጠይቃለን፡፡

በቃለ-መጠይቁ ወቅት የሚያነሳቸውን ነጥቦች ሙሉ በሙሉ ለማስቀረት ይረዳን ዘንድ የእርስዎ ፍቃድ ከሆነ ቃለ-መጠይቅ በመቅረፁ-ድምጽ የሚቀዳ ይሆናል፡፡ ይህም በመሆኑ ድምፅዎን በሚሰማ መልኩ ጮክ ብለው እንዲናገሩ አሁንም በማክበር እጠይቃለሁ፡፡ ይሄም ከጊዜዎች ከ15 ደቂቃ ያነሰ ይወስዳል፡፡

በዚህ የቃለ- መጠይቅ ሂደት የሚገኙ ማናቸውም መረጃዎች በሚስጥር የሚጠበቁ ይሆናል፡፡ ይህም ማለት የሚሰጡን መረጃ ከጥናት ቡድኑ አባላት ውጪ ለማንም ግልፅ የማናረግ ሲሆን የሚዘጋጁ የቃለ-መጠይቆች ዘገባዎችም

እርስዎን እንደመረጃ ሰጪ የማይጠቅሱ ይሆናል። እርስዎ መናገር ስለማይፈልጉት ነገር ለመናገር እንደማይገደዱ እና ቃለ-መጠይቁን በማንኛውም ጊዜ ማቋረጥ እንደሚችሉም ላስታውስዎት እወዳለሁ። በቃለ-መጠይቁ ለመሳተፍ ፍቃደኛ ነዎት ?

አዎ ☐ አይደለም ☐

በቃለ-መጠይቁ ለመሳተፍ ፍቃደኛ ከሆኑ ቃለ-መጠይቁ ይጀምራል።

2. በቃለ-መጠይቁ ወቅት የሚነሱ ነጥቦች ዝርዝር

ተ.ቁ.	የጥያቄው ማብራሪያ	በፍፁም የማያረካ	የማያረካ	በመጠኑ የሚያረካ	አርኪ	እጅግ የሚያረካ
1	በፋርማሲው ውስጥ የሚገኙ ቁሳቁሶችን ኮምፒውተር፣ የአየር ሙቀት መቆጣጠሪያ) እንዴት ይገመግሙታል?					
2	የመድሃኒት ቤቱ የፅዳት ሁኔታ እንዴት ይገመግሙታል?					
3	የመድሃኒት ቤት ሠራተኞች የሙያ ክፍሎቻቸውን እንዴት ይገመግሙታል?					
4	የመድሃኒት ቤቱ ስፋት ለመድሃኒት ወይም ሌሎች የግዢ ዕቃዎች እደላ አመቺነቱ እንዴት ነው?					
5	የመድሃኒት ቤቱ ሠራተኞች እርስዎ ለሚያቀርቡት የሙያ ጥያቄ ያላቸውን ምላሽ እንዴት አገኙት?					
6	የመድሃኒት ቤቱ ሠራተኞች እርስዎ ለሚያቀርቡት ቅሬታ ያላቸውን ምላሽ እንዴት ይገመግሙታል?					
7	የመድሃኒት ቤቱ ሠራተኞች እርስዎ የጠየቁት ዕቃ በአጋጣሚ በወቅቱ ባይገኝና ይህንኑ ዕቃ በአፋጣኝ ለማምጣት ቃል ከገቡ በኋላ ቃላቸውን የመጠበቅ ብቃታቸውን እንዴት አገኙት?					
8	የመድሃኒት ቤቱ ሠራተኞች እርስዎ በሚስተናገዱበት ወቅት በሌላ ሥራ የመጠመድ ሁኔታ ካለ እንዴት አገኙት?					
9	የመድሃኒት ቤቱን የሙቀት፣የእርጥበትና የመታፈን ሁኔታ እንዴት ይገመግሙታል?					
10	ችግር በሚገጥሞት ወቅት የሠራተኞቹን ተባባሪነት እንዴት ይገመግሙታል?					
11	የመድሃኒት ቤቱ ሠራተኞች የገዙትን ዕቃ በአግባቡ ሸፍኖና ማብራሪያ ሰጥቶ የመሸኘት ብቃታቸው እንዴት ነው?					

ተ.ቁ.	የጥያቄው ማብራሪያ	በፍፁም የሚያረካ	የሚያረካ	በመጠኑ የሚያረካ	አርኪ	እጅግ የሚያረካ
13	ከመድሃኒት ቤቱ ታሽጎ የተሠጡትን ዕቃ ይዘው ሲሄዱ በቁጥር ጎድሎ ያለመገኘት እድሎን እንዴት ይገመግሙታል?					
14	በመድሃኒት ቤቱ ሲስተናገዱ ሁልጊዜ የሠለጠነ ባለሞያ መኖሩን እንዴት ይገመግሙታል?					
15	በመድሃኒት ማዘዣ ወይም በቃል የተሰጠን ትዕዛዝ ሠራተኞቹ የሚረዱበትን አኳሃን እንዴት ይመዝኑታል?					
16	በመድሃኒት ማዘዣ ወይም በቃል ለተሰጠ ትዕዛዝ ሠራተኞቹ ምላሽ የሚሰጡበትን አኳሃን እንዴት ይመዝኑታል?					
17	የመድሃኒት ቤቱ ሠራተኞች አፋጣኝ መልስ የሚሹ ጉዳዮች ሲገጥሙ የሚሰጡትን ምላሽ እንዴት አገኙት?					
18	የመድሃኒት ቤቱ ሠራተኞች አፋጣኝ መልስ የሚሹ ጉዳዮች ሲገጥሙ የሚሰጡትን ምላሽ እንዴት አገኙት?					
19	የመድሃኒት ቤቱን የሥራ ሰዓት አገልግሎት ከመስጠት አንፃር እንዴት ይመዝኑታል?					
20	የመድሃኒት ቤቱ ሠራተኞች ለእያንዳንዱ ተስተናጋጅ በግል የሚሰጡትን ትኩረት እንዴት ይገመግሙታል?					
21	የመድሃኒት ቤቱን የክፍያ ስርዓት እንዴት ይገመግሙታል?					
22	የመድሃኒት ቤቱ የደንበኛን ፍላጎት ተረድቶ የማስተናገድ ብቃታቸውን እንዴት ይመዝኑታል?					

ስለሰጡኝ ጊዜና ስላደረጉልኝ ትብብር ከልብ አመሰግናለሁ!!

Annex 5: List of Pharmacies Included in the Study

ተ/ቁ	የድርጅቱ ስም	ደረጃ	ከ/ከ	ወረዳ	የቤት. ቁ
1	ብስራት መ/ቤት		ቦሌ	3	1139
2	ኢትዮ-ጀርመን	መ/ቤት	ጉለሌ	9	449/ሐ
3	ሕሊና	መ/ቤት	ን/ላፍቶ	9	41
4	ሰንሻይን	መ/ቤት	ቦሌ	12	A5-1
5	አርሴማ	መ/ቤት	ኮልፌ ቀራኒዮ	3	140/2
6	ፍኖተ	መ/ቤት	አራዳ	2	490
7	አክሱም ቁ.5	መ/ቤት	ኮልፌ ቀራኒዮ	6	አዲስ
8	መቻሬ	መ/ቤት	ንፋስ ስልክ	4	አዲስ
9	ይስሀቅ	መ/ቤት	ቦሌ	1	1426
10	ግሸን ቁ.1	መ/ቤት	የካ	8	367/ለ
11	ኢዮቤፅ	መ/ቤት	ቦሌ	13	192
12	ሲኤምሲ ሚካኤል	መ/ቤት	ቦሌ	8	1415
13	ግሸን ቁ.5	መ/ቤት	ቦሌ	8	1734
14	ፍራኦል	መ/ቤት	የካ	2	489
15	ፍሬአብ	መ/ቤት	አቃቂ ቃሊቲ	6	1706
16	አቦ	መ/ቤት	ንፋስ ስልክ ላፍቶ	3	792/ለ
17	አስኳል	መ/ቤት	ቂርቆስ	15	432
18	ምንተሰኖት	መ/ቤት	ኮልፌ ቀራኒዮ	4	3051
19	ሮህ	መ/ቤት	ንፋስ ስልክ ላፍቶ	2	አዲስ
20	ስፕሪንግ	መ/ቤት	አራዳ	2	608
21	ፍቱን	መ/ቤት	ልደታ	7	386
22	ቪኸን	መ/ቤት	ልደታ	9	9999/5
23	ሐረር	መ/ቤት	አዲስ ከተማ	8	5
24	ፕራይም	መ/ቤት	ቦሌ	12	419/ለ
25	እብራይስጥ	መ/ቤት	አዲስ ከተማ	12	1975/03
26	ሉሲ	መ/ቤት	ልደታ	8	አዲስ
27	ግሸን ቁ.3	መ/ቤት	ቦሌ	3	2353
28	ሪቸ	መ/ቤት	ኮልፌ ቀራኒዮ	4	732

ተ/ቁ	የድርጅቱ ስም	ደረጃ	ክ/ከ	ወረዳ	የቤት. ቁ
29	ጥሩ	መ/ቤት	አዲስ ከተማ	2	541
30	ናማሊያ	መ/ቤት	ንፋስ ላፍቶ	12	2433
31	ጉመሪ	መ/ቤት	አራዳ	2	1024