



ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

ASSESSMENT OF PHARMACEUTICALS DISTRIBUTION SYSTEM: THE CASE OF PHARMACEUTICALS FUND AND SUPPLY AGENCY (PFSA)

**IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE
OF MASTERS OF ART IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT**

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June, 2017

Addis Ababa

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LIST OF ACRONYMS AND ABBREVIATIONS

FMOH	Federal Ministry of health
HIV	Human Immune virus
IPLS	Integrated pharmaceuticals system
LMIS	Logistics Management and Information system
PFSA	Pharmaceuticals Fund and Supply Agency
SCMS	Supply Chain Management System
TB	Tuberculosis
USAID	United States Aid for International Development
WHO	World health Organization
FEFO	First Expire First Out
GPS	Global positioning system
RRF	Report and requisition form

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ABSTRACT

Government of Ethiopia is focusing to avail pharmaceuticals at an affordable price, accessible to all citizens through pharmaceuticals fund and Supply agency. However the Ethiopian pharmaceuticals distribution system is constrained by weak distribution practices and weak fleet management.

The objective of this study was to assess the pharmaceuticals supply chain distribution system practices at PFSA. The study employed both quantitative and qualitative study approaches. Quantitative data was collected from 41 employees using self-administered questionnaires, whereas, interview questions were also used to collect qualitative data from the two directors and 31 Drivers. Descriptive data analysis method through the use of Statistical packages for social science (SPSS) version 20 software was used to analyze the data.

Findings of the study showed that most of the employees perceived the following; warehousing and storage are moderately practiced however computerized system for inventory control to pick products was not fully implemented in the warehouses, availability of mechanical machines is very low. Location of some warehouses was not comfortable to load pharmaceuticals. They also agreed that fleet management of the agency has the following problems: global positioning system (GPS) was not in place, volume of the vehicles is not known, there is low coordination with receiving health facilities. During transportation, pharmaceuticals were managed by drivers. Delivery document prepared as soon as they come from hubs and health facilities, however there are limitations in that documents were not prepared considering to pick all products from a single warehouse. The study recommends that agency shall fully implement computerized system and use of mechanical machines in the warehouses. To control vehicles, PFSA shall apply GPS and perform volume determination for each vehicle. It is also recommended pharmacy professional shall handle when transporting pharmaceuticals. Over all, the entire agency is expected to work coordinately with receiving health facilities.

Key words; distribution practices, warehousing and storage , fleet management, Communication system

CHAPTER ONE: INTRODUCTION

1.1 Back ground of the study

Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies” (*Council of Supply Chain Management Professionals, 2011*). Supply chain management is one of key activities in Pharmaceuticals sector. To get competitive advantage over rivals, supply chain emerged as a core capability for most pharmaceutical companies (Lurquin M. 1996). The main purpose of Pharmaceuticals Logistics is to achieve the Six Rights (Right product, Right Quality, Right Quantity, Rightcost ,Right Time, Right Place). Pharmaceutical logistics involves the following main activities, Selection, quantification, Procurement, Storage ,distribution and use. At the center of the cycle management support and logistics management information system is an engine (USAID/DELIVER report, 2011).

The primary pharmaceuticals distribution management goal is to maintain a steady state supply of pharmaceuticals and supplies to health facilities where they are needed. (management science for health, 2012).

In Ethiopia, pharmaceuticals market is increasing from time to time. Most of the pharmaceuticals (75%) are imported; however 25% of the pharmaceuticals are manufactured locally. So the distribution of Pharmaceuticals needs great attention in order to reach the end customers.

The pharmaceuticals supply chain passes steps from demand forecasting by health facilities, procurement from international and national suppliers, importing, storage and distribution to health facilities and end users. Distribution of pharmaceuticals follows integration pharmaceuticals logistics system (IPLS), through which all pharmaceuticals requested, reported, received and managed integrated manner. Pharmaceuticals fund and supply agency is responsible for distribution of pharmaceuticals mainly to public hospitals, health centers, Woreda health office and private Pharmacies.

During distribution of Pharmaceuticals the agency follows mainly three tier distribution system. From central PFSA to PFSA branches then to health facilities.

This Study explored the pharmaceuticals distribution System of PFSA.

1.2 Back ground of the organization

In order to bring efficiency in the Pharmaceuticals Supply chain PHARMID was transformed to pharmaceuticals fund and supply agency (PFSA) in 2007 G.C. which is responsible for managing mainly public Pharmaceuticals. Since then the agency performed several measures, of which; introduce new staffs who work on Pharmaceuticals supply chain, Built ware houses and buy new Vehicles. Currently the agency is under ministry of health which stands for forecasting, procurement, warehousing and distribution of pharmaceuticals throughout the country. The agency has 17 branches which are found in all regions of Ethiopia. It has more than 2000 employees. The agency has the following directorates; Forecasting, Procurement, warehouse and distribution, Human resource and general service, Plan and program, Information management, Finance and other supporting offices. There are 18 distribution officers and 5 general service officers. There are 20 Warehouse managers who have been participated in the study.

The Agency manages both Program (donated and free) and revolving drug fund (purchased) Pharmaceuticals. Distribution of pharmaceuticals is mainly performed by Storage and distribution directorate and general service unit. Currently the Central PFSA has 10 warehouses and 31 functional vans and heavy load Vehicles to distribute pharmaceuticals (PFSA, 2016).

1.3 Statement of the problem

World health Organization (WHO) states that access to medicine is a human right. Government of Ethiopia is focusing to avail pharmaceuticals at an affordable price and accessible to all citizens through pharmaceuticals fund and Supply agency. The agency tries to improve delivery of the right medicine at the right time with reduced cost. However still problems are observed due to an increase in the need of pharmaceutical products in the country, and less efficiency of distribution with the existing distribution network (Lissanework, 2013). A crucial component of Pharmaceuticals Supply Chain activities is the efficient and effective warehousing and distribution System.

The Ethiopian pharmaceutical supply chain has several problems including non-availability, unaffordability, poor storage, lack of stock management and weak distribution system including weak fleet management. Health Facilities have problems to get right products; right quantity and right quality are not available at the right time, right place, for the right cost due to poor distribution system (PFSA, 2015). Products which are found at central level may not be found in all hubs. Central PFSA uses 8 rental warehouses which are located at different parts of Addis Ababa City. This has a high negative impact for smooth distribution system.

As E. Lissanework, 2013, referenced, mechanical assistance is low in these warehouses. In addition to this PFSA is constrained by shortage of vehicles, portable cold chains, cold rooms, racks and pallets. The main challenges that affect PFSA performance are; its dependency on international suppliers due to lack of local competitive supplier, very long procurement process, limited vehicle capacity for distribution, lack of skilled manpower and poor demand forecasting capacity (Mered, 2015). The situation seems higher at hub levels. Due to this the hubs are not sufficient to satisfy the need of clients. Besides to shortage of vehicles there is weak coordination among general internal and external stakeholders.

It is thus critical to explore the existing supply chain distribution practice at pharmaceutical Fund and Supply Agency (PFSA). Thus this research assesses the pharmaceuticals supply chain distribution system of PFSA.

1.4 Research Questions

The following main research questions are proposed:

- What does the Pharmaceuticals Supply chain Ware housing and Storage System look like?
- What are the Challenges of Pharmaceuticals Supply chain distribution System?
- How are the distribution practices applied in the agency?
- What does the fleet management and communication system of pharmaceuticals fund and supply agency among internal units and external stakeholders?

1.5 Objectives

1.5.1 General objectives

The general objective of this research is to assess the perception of employees on pharmaceuticals supply chain distribution system practices at PFSA.

1.5.2 Specific objectives

- To assess warehousing and storage practices in Pharmaceuticals distribution system.
- To identify what challenges do employees face in Pharmaceuticals supply Chain distribution system
- To identify the implementation of distribution practices at PFSA.
- To assess the transportation ,coordination system among Internal and external units.

1.6 Significance of the Study

This study assess the Pharmaceuticals supply Chain distribution system practices such as warehousing and Storage, coordination in fleet management, and some of the challenges in pharmaceuticals supply chain distribution system at PFSA. The findings and recommendations of the study will be useful for policy makers and system designers to improve the distribution system of pharmaceuticals supply chain.

The study will contribute valuable information to improve warehousing and storage, fleet management and coordination system in the Pharmaceuticals distribution system. The study result will be helpful for Federal ministry of Health, local Pharmaceuticals importers and distributors, health facilities, woreda and regional health offices health policy makers, healthcare providers, donors and all stakeholders involved in pharmaceuticals warehousing and distribution to effectively plan and manage the distribution system and storage practices of pharmaceuticals in Ethiopia. The result of the study will be useful for PFSA management for implementing corrective measures which improves supply chain distribution system. There are limited numbers of studies done on this area, so this Study will be useful for academicians to further studies on the area. The research will also bring directions for further investigators.

1.7 Scope of the Study

The scope of the research is on Pharmaceuticals supply Chain distribution system at Pharmaceuticals fund and supply agency. The study did not include branches and health facilities due to time and budgetary constraints.

1.8 Limitation of the study

The limitation of the study is, it only focuses on the case of central PFSA employees. The data has been collected from central PFSA warehouse, distribution and transport units. Assessing the employees perception on distribution practices of branches, health facilities, private pharmacies and other stakeholders and detail analysis of data is needed for further conclusion.

1.9 Conceptual Definitions

Pharmaceuticals: are all medicines, laboratory reagents, medical supplies and medical Equipments.

Distribution: Distribution is the process by which products are physically transferred from their Point of production or upstream warehouse to the point at which they are available to the final customer

Health Facilities: are hospitals and health centers who receive pharmaceuticals from PFSA branches.

Warehouse managers: are professionals who manage pharmaceutical products at different warehouses of pharmaceutical fund and supply agency.

CHAPTER TWO: LITERATURE REVIEW

2.1.Overview of Pharmaceuticals Supply Chain

Pharmaceuticals supply chain is the integration of all activities involved in Medicines selection, Quantification, procurement, warehousing, distribution and use (*Management science for health*,2012).Medicines supply chain:anetwork of individuals and firms, and the sequence of processes involved in theproduction, handling and distribution of medicines. Pharmaceuticals logistics involves major activities in the logistics cycle (USAID/deliver, 2011).

The main Pharmaceutical logistics activities are;

- 1.Selection
- 2.Quantification
- 3.Procurement
4. Warehousing and storage
- 5.Distribution
- 6.Serving customer

Serving Customers is the end result of all activities in the logistics cycle. we do all of our work in logistics in order to serve the customer. In any health logistics system, health programs must select products. In a health logistics system, a national formulary and therapeutics committee, pharmaceutical board, board of physicians, or other government-appointed group may be responsible for product selection. Another activity in the logistics cycle is quantification which is the process of estimating the quantity and cost of the products required for a specific health program (or service), and, to ensure an uninterrupted supply for the program, determining when the products should be procured and distributed. After a supply plan has been developed as part of the quantification process, quantities of products must be procured. Health systems or programs can procure from international, regional, or local sources of supply; or they can use a procurement agent for this logistics activity. Inventory management is the process of maintaining of stock properly at all levels of the supply chain and at all times whereas Storage is the management of storehouses and stock cards, the operation of holding and storage of pharmaceuticals and the safe custody and protection of stock. After an item has been procured and received by the health system or program, it must be distributed to the service delivery level where the client will receive the products.

According to WHO technical report (no. 957)2010,distribution is an important activity in the integrated supply-chain management of pharmaceutical products. Various people and entities are generally responsible for the handling, storage and distribution of such products.

Logistics Management Information is the engine that drives the logistics cycle, without information, the logistics system would not run smoothly.

2.2. Pharmaceuticals Supply Chain in Developing Countries

A workshop by WHO (2006) outlines the difficulties of the medicine supply of African countries;the main challenges being poor information, communication and consumption data,inadequate storage facilities and temperature control systems and a lack of quality assurance procedures.

According to Prof. Allan,(2013)the main Supply Challenges of African countries are poor information, communication and consumption data, inadequate storage facilities and a lack of management procedures. The challenges include selection and quantification of demand, a lack of transparent procurement procedures, inadequate storage facilities and capacity, lack of guidelines for good storage procedures, a lack of appropriate planning, monitoring and evaluation and inadequate budget allocation.

Health product supply chains in developing countries are fraught with many problems. Ineffective supply chains weaken the overall health system's ability to respond to the healthcare needs of the population and put treatment programs at risk (Yadav,Smith, andHanson. 2012)

A study done In Kenya Shows the commercial supply chain has a highly fragmented pyramidal structure, with a few manufacturers at the top and a large but undefined number of retailers at the base. The distribution of suppliers is skewed in favor of urban locations, creating a crowded environment there, and a large underserved market in rural allocations (PSP4H, 2014). Asamoah *et al.* (2011), studied the pharmaceutical supply chain for anti-malarial drug in Ghana. It was found that there are two main supply channels i.e. private and public channels. But both chain lack information technology leading to disruption and delay in the Supply chain system. These lead huge implication in drug security and affordability. To achieve availability of drugs at the right time and place the availability of information infrastructure is mandatory for the supply chain(Yadav,2015).According to Health and Education advice And resource team study(2016)

States Some African Countries (Kenya,Zambia, Uganda, Mozambique, Sierra Leone,Tanzania and Ethiopia) Have National pharmaceuticals procurement and Supply institutions. However these institutions have problems including; longer tier system, Weak information flows along the tiers, weak measurement of Supply chain performances, Transportation problem and weak supply chain leadership.

2.3. Pharmaceuticals Supply Chain in Ethiopia

The Federal Ministry of Health (FMOH) of has been working to ensure an efficient and high performing healthcare supply chain that will ensure equitable access to affordable medicines for all Ethiopians. In past years, significant progress has been made, although various challenges remain; an inadequate supply of quality and affordable essential pharmaceuticals, poor storage conditions, weak stock management and weak distribution system which resulted in high levels of waste and stock outs. To address these challenges, the FMOH initiated a comprehensive supply chain strategic planning process, which led to the Pharmaceuticals Fund and Supply Agency (PFSA) being established in 2007. In 2009, as part of a major intervention to improve the supply chain situation in the country, PFSA, in partnership with its support partners the USAID | DELIVER PROJECT, Supply Chain Management Systems (SCMS), and others in the sector developed and began implementing the Integrated Pharmaceuticals Logistics System (IPLS)(Mered,2015).IPLS is the term applied to the single pharmaceuticals reporting and distribution system based on the overall mandate and scope of the PFSA. It aims to ensure that patients always get pharmaceuticals they need. To be successful, the system must fulfill the six rights of supply chain management by ensuring the right products, in the right quantity, of the right quality, at the right place, at the right time and for the right cost (PFSA, 2015).

According to IPLS Pharmaceutical supplies flow from International or local suppliers to health facilities through PFSA, however Information is expected to be exchanged to bottom-up and Vice versa.

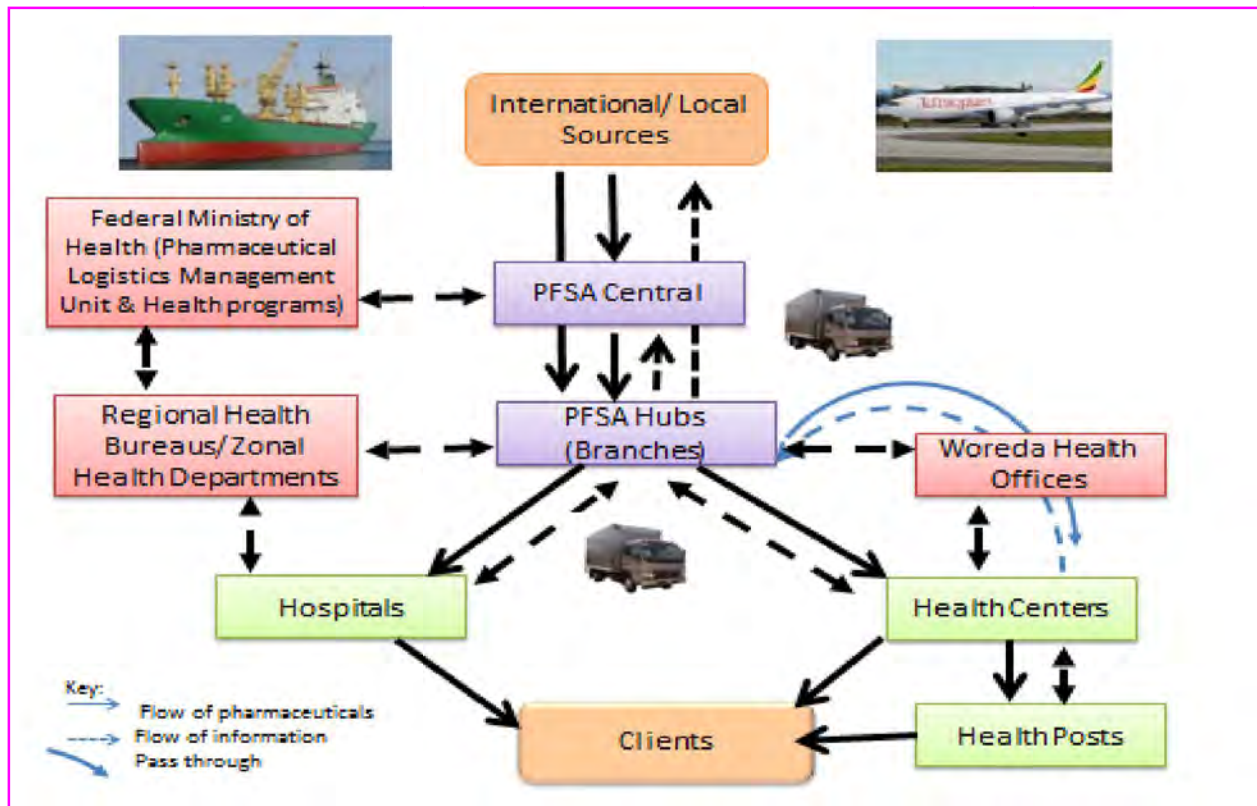


Fig. 2.1 Flow of Pharmaceuticals and Information in the Integrated Pharmaceutical Logistics System (IPLS)

Pharmaceuticals Supply Chain practices and challenges in different industry of Ethiopia were studied in different dissertations.

Sewuye (2013) Studied the Supply Chain Management practices of Ethiopian pharmaceuticals manufacturing companies the result shows that it is not strong due to both internal and external factors that affect implementation of SC strategies in the company. (Tedila, 2015), Studies shows Pharmaceuticals supply Chain Management practices implemented in both hospitals and health center pharmacies include JIT supply, holding safety stock, few suppliers, close partnership with suppliers, close partnership with customers, Level of information quality (IQ) but many supplies also practiced only in governmental health Centre pharmacies.

A study done by Lissanework(2013) indicates the following main problems related to pharmaceuticals distribution are observed; the available branches are not enough, Limitation in space in the warehouse, The frequency of delivery is very low, Poor forecasting knowledge and

techniques, There is also delay because of the routing problem, The warehouse facilities are manual, and Shortage of transport vehicles is observed.

2.4. Pharmaceuticals supply Chain distribution

Distribution is the process by which products are physically transferred from their point of production or upstream warehouse to the point at which they are available to the final customer. It is also called outbound logistics. The primary goal of distributing medicines is to maintain a steady supply of pharmaceuticals to facilities where they are needed, while ensuring that resources are being used in the most effective way. A good distribution system is a cost effective system that provide acceptable level of service. A well-run distribution system has the following qualities: Constant and uninterrupted supplies; Maintain commodities in good condition until they are used; Minimizes losses due to spoilage and expiry; Prevents theft and fraud; Maintains accurate stock; Efficiently uses transport resources; Enables collection of accurate information for forecasting(PFSA,2016).

Distribution System has four Major elements;

System Type: geographic coverage, population coverage, no of levels in the system, Pushor Pull system, degree of centralization.

Information system: Inventory control, records and forms, Consumption reports, Information flow.

Storage: selection of sites, building design, materials handling systems,order picking lay out.

Delivery: collection versus delivery, in-house versus 3PL, dedicated or shared arrangements (Management Sciences for health, 2012).

The pharmaceutical distribution chain is composed of manufacturers, distributors (wholesalers and importers), and retailers (public and private pharmacies, drugstores, online sellers, supermarkets, anddispensing doctors). In most developed countries, the various stakeholders in the supply chain areregulated extensively to improve the affordability and availability of medicines as well as maintain levelsof service. In many low- and middle-income countries, the distribution chain is neither regulated nor subject to any formal oversight and, as a result contributes to problems of availability and affordability of medicines (*Kanavos, Panos etal (2014)*).

According to Kanavos et al excessive fragmentation is an important difference between developed and developing countries' drug distribution systems. In developed countries, comparatively few large firms control the market and regulatory authorities require some chain of custody documentation. In low- and middle-income countries, the system is vastly more complicated. Sometimes multiple parallel distribution systems of varying efficiency run in the same country (Sewuye,(2013).

Ethiopian pharmaceuticals distribution system is a typical three-level distribution system, the physical size of the central or branch warehouses is determined by national or regional demand for Pharmaceuticals and by the supply frequency. Pharmaceuticals distributed to health facilities from nearby PFSA branches. In Ethiopia pharmaceuticals distributed through two mechanics. Regular drug fund Pharmaceuticals are Collected from branches, however pharmaceuticals used in programs (like HIV, Malaria, TB, etc.) are directly delivered to health Facilities.

Modern Good Distribution Practices for pharmaceutical products incorporates and provide for minimum requirements on aspects of the following:

1. Quality management
2. Premises and equipment's
3. Personnel
4. Operations like Stock handling and Stock control
5. Transport
6. Complaints, Return and Recall
7. Documentation and records
8. Counterfeit Pharmaceutical products
9. Disposal of pharmaceutical products (PFSA, 2016, distribution manual)

2.5. Transportation/fleet management in supply chain management

Transportation refers to the movement of products from one location to another such as moving products from the beginning of a supply chain to the customer's hands. It plays a key role in every supply chain as products are rarely produced and consumed in the same location. Transportation is significant component of the cost most supply chain incurs. Any supply chain's success is closely linked to the appropriate use of transportation. Responsive transportation system is effectively used to lower supply chain's overall cost.

The existing transport system should be thoroughly reviewed to make efficient and rational use of existing resources. Current operating costs should be accurately assessed and compared with

the projected cost of alternative system. The following examines the issues that must be considered when planning improvements in a transport system: understand the existing system, plan routes and schedule, analyze transport alternatives and prepare a transport plan.

The following few points are very important in managing vehicles efficiently, safely, and cost effectively and suggests ways to minimize wastage.

- a. Use of onboard computers/GPS
- b. Prevention of vehicle misuse
- c. Training of drivers
- d. Insure vehicle security (PFSA, 2015, pharmaceuticals distribution manual)

2.6 Pharmaceuticals Warehousing and storage system

Warehouse is a central hub in the supply chain, where inventory is received from vendors/suppliers and stored until it's eventually distributed to consumers. Store is a location where materials are preserved while storage is a means of organizing and handling inventory in stores. In other words, storage is the management of storehouses and stockyards, the operation of holding and storage of pharmaceutical & related supplies and protection of such products. Warehouse Management is much broader and includes activities such as holding, quality control, training of stores staff, and clerical administration of warehouse operation.

Despite today's just-in-time production mentality, with its efforts to eliminate warehouses and their inventory carrying costs, effective warehousing continues to play a critical bottom line role for companies worldwide. The primary purpose of a pharmaceutical warehouse is to receive, hold and dispatch pharmaceuticals. It ensures the physical integrity and safety of products and their packaging, throughout the various storage facilities, until they are dispensed to clients. Functions of warehousing include: Transportation consolidation, product mixing and cross-docking. The main objective of stores' function is to render service to the users and protect against contingencies i.e., it is a means of holding and protecting commodities for later use, and the system by which such commodities are handled and controlled for efficient retrieval. In addition, it smooth's the operation of distribution.

Warehouse management operations comprises of the physical movement of a stock in to, through, or out of a warehouse. Regardless of storage facility size—from a small health center to a central warehouse—the main operational activities for storage are very similar and include receiving, putaway, storage, stock location, warehouse management system, picking and packing, and shipping. In general, warehouse operations can be categorized as those operations which involve movement.

The main ware house operations involves management of; Receiving, Put-away, order picking and shipping(PFSA, 2015, Pharmaceuticals warehouse manual).

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research methods

The research uses mix of both quantitative and qualitative methods. Staffs who were responsible for Pharmaceuticals supply chain distribution and management on the practice of warehousing, challenges of distribution, fleet management and coordination, storage, loading and unloading has been assessed. Drivers who were engaged on transportation of pharmaceuticals has been included in the study.

3.2 Study Units

Unit of analysis was PFSA which engaged in distribution of pharmaceuticals for health Facilities and different Private pharmacies.

3.3 Sampling technique and sample size Determination

Based on the objective of the study the researcher uses purposive sampling. Directors from the two directorates (stock and distribution and human resource and general service) were involved because most of the distribution operations are managed by them. All 18 distribution officers and 5 general service officers have been selected in the assessment. 20 warehouse managers were selected to participate in the study. Thirty one (31) drivers were also included in the study to assess their perception on the pharmaceuticals distribution system.

3.4 Sources and Tools of Data Collection

The study uses the following tools for data collection;

Data has been collected from, distribution officers, general service officers and warehouse managers using structured self-administered questionnaires which have closed ended questions.

Interview questionnaires were used to collect some of the qualitative data from directors and drivers (Amharic version).

3.5 Procedures of data collection

For the data that were collected using self-monitored questionnaires, first the respondents have been communicated to get their consent. After getting their consent, the prepared questionnaires were distributed to each participant. The questionnaires have been collected by checking the completeness of the data and by appreciating their participation and devoting their precious time for the research.

For interview questionnaires, responsible personnel have been communicated for his/her consent for the interview and then the investigator has asked and receives answers for each question with necessary clarifications.

3.6 Pre-testing of tools

The data collection tools were pilot tested on two distribution officers, one general service officer and two drivers in order to check the clarity, validity, ambiguity and readability of the statements and questions. This helped the researcher to get a feedback on leading and biased questions and to know the time that is needed to complete the questionnaire. During the pilot study, the researcher has been able to explain some vocabularies. Tools were modified accordingly after the pilot.

3.7 Ethical clearance

In this study permission was asked from PFSA management and the two directorates namely stock and distribution directorate and human resource and general service directorate. After getting consent from the management data collection was started. It was also told to each respondent that the information that was collected will be kept confidential.

3.8 Method of data analysis and reporting of results

The collected data was checked initially to detect for any errors to ensure consistency and completeness. After the data is checked it was coded, entered and analyzed by the use of IBM Statistical Package for the Social Sciences (SPSS) version 20. Study results have been presented by using descriptive statistics (mean, standard deviation, proportion, and percentage), and tables.

CHAPTER FOUR: RESULTS AND DISCUSSIONS

In this part the data that were collected using interview and self-administered questionnaires are presented and discussed. Collection of data for this study is centered on the following issues, employees perception on; product warehousing and storage conditions, Fleet management and coordination, delivery documents preparation and communication, loading and unloading, main challenges during transporting and receiving of pharmaceuticals and system issues in distribution of pharmaceuticals.

Self-administered questionnaires were used to collect data from distribution officers, store managers and general service officers regarding product warehousing and storage conditions, Fleet management and coordination, delivery documents preparation and communication, loading and unloading issues. To triangulate the quantitative information, interview questions were used to collect data regarding the overall distribution practice from distribution head and general service head. In addition, Interview questions were prepared in Amharic and used to assess main Challenges during transportation and delivery of pharmaceuticals.

The results are organized as follows:

4.1. Quantitative data analysis

Respondents were asked to rate their opinion about supply chain distribution practices at PFSA using self-administered Questionnaires. A total of 43 questionnaires were distributed, of which 40(93%) were completely filled and returned. These were used for the subsequent analysis. The remaining 3 questionnaires were not collected due to refusal to give response for the questionnaires. Using descriptive statistics; frequency, percentage, mean and standard deviation of the responses are summarized and presented as follows.

4.1.1 General information of respondents

Table 4.1 General information of respondents

Variable	Category	Frequency	Percentage
Gender	Male	31	77.5
	Female	9	22.5
Age	<25	2	5
	26-35	29	72.5
	35-44	8	20
Educational background	Certificate	2	5
	Diploma	21	52.5
	Degree and above	17	42.5
Position in the agency	Team leader	2	5
	Officer	18	46.2
	Store manager	19	48.7
Years of experience	<5	22	55
	5-10	13	32.5
	>10	5	12.5
In which directorate you are working	Storage and distribution	34	85
	Human resource and general service	5	12.5

Out of the respondents 77.5% were male and the remaining 22.5% were female. Majority (72.5%) of the respondents are in the age of 26-34. This indicates that majority of the employees working in distribution system are young and at productive age group.

Half of the respondents (52.5%) are diploma holders. This is because all of the positions at warehouse and storage require diploma level professionals. However 42% of the professionals are BSC/BA holders. This indicates that most of the employees working in the Pharmaceuticals distribution area of PFSA are middle level professionals. From the table we can see that equivalent percentage of officers and warehouse managers were participated.

Majority of the respondents have experiences less than five years. The number is reduces as experience is increasing, this is due to leaving of professionals after getting some experience.

From all respondents 85% of them are working at Storage and distribution directorates. This is because that majority of distribution activities are managed by this directorate.

4.1.2 product warehousing and Storage condition

Using likert scale of 1-5, respondents rated warehousing and storage condition practices of PFSA from very low to very high as shown below:

1. Very low
2. Low
3. Moderate
4. High
5. Very high

Table 4.2 perception of employees on products warehousing and storage practices

Product warehousing and Storage condition practice	Very low (%)	low (%)	moderate (%)	high (%)	very high (%)	Mean	Standard deviation
Usable and Unusable products are separated	20	7.5	35	35	2.5	2.93	1.16
The store manager easily knows where the product is located in the warehouse	7.5	7.5	17.5	55	12.5	3.58	1.06
There is Computerized system that facilitates picking the products	17.9	30.8	23.1	20.5	7.7	2.69	1.22
The shelves and pallets of the Product in the warehouse are adequate	7.9	26.3	39.5	18.4	7.9	2.92	1.05
The space between the shelves is enough for free movement of personnel and products	2.5	27.5	45	25	0	2.93	0.78
Picking products doesn't take too much time	2.5	17.5	57.5	22.5	0	3	0.72
There is adequate human power to load and unload pharmaceuticals	2.5	10	47.5	40	0	3.25	0.74
The warehouse has enough space to store the products	2.5	25	55	15	2.5	2.9	0.78
Machines are available for loading and unloading	10	20	52.5	17.5	0	2.78	0.86
The warehouse area is comfortable to load and Unload the products to and from vehicles	7.5	35	35	20	2.5	2.75	0.95

As shown in the table 4.2 above, respondents rated the practice of separating usable from unusable products in PFSA from very low to very high. While 27.5% of the respondents rated the practice in PFSA is low, 37.5% of them rated high. The rest (35%) were to the opinion of that separation practice is moderate. However, the mean rating for this practice was found to be moderate ($x=2.93$, $SD=1.16$). The opinion of employee to rate this variable is varied hence some of the warehouses included in this study have wider space however others have narrow space to have quarantine stock.

From all respondents majority of them agreed that store managers can easily identify the location of pharmaceuticals with mean value of 3.58 and standard deviation of 1.06.

This practice has higher score over other practices. This happens because products are separately stored based on their program. According to this result warehouse managers can easily apply first expire first out/FEFO principle.

Computerized system can facilitate the picking process in warehouses. On this variable 48.7% of the respondents rate the practice is from very low to low. However 28% of the respondents rate high. The mean value of this practice is 2.69 with standard deviation 1.2. The perception of practice is lower than other practices. Even though the agency uses health commodity management Information system/HCMIS/ to track and control inventory of pharmaceuticals, some stores have constraint of using this system. If warehouses are not fully computerized to pick, inventory control it will have negative impact on supply chain decisions.

Respondents perceived that availability of shelves is adequate. So this result shows as there is no shortage of shelves and pallets in the warehouses of PFSA. Those warehouses which are built by the agency are fully racked system. That is why most of respondents says availability of shelves is adequately enough.

The space between shelves is necessary to fast the picking and loading process hence the result of this study shows the space between shelves and pallets is moderately enough. This result is consistent with the opinion that separation of usable and unusable products in the warehouses is moderate good.

According to the respondents result 47.5% of them says human resource available in the warehouses is moderately enough (mean=3.25). Thus drivers may not wait to pick products from warehouses due to constraint of human resource.

Majority percent (55%) of the respondents agree as the space available to store pharmaceuticals is moderately enough. The result of this practice is opposite with the result of Lissanwork E. (2013) study in the same organization, which says PFSA has storage area limitation. However PFSA has built and finalized a modern warehouse since 2014, this contributes to get more space at warehouses. In addition to this the agency has been doing de-junking during end of every year which will contribute to get more space.

Mechanical machines have higher importance to support loading unloading process during distribution majority of the employees (52.5%) believe machines are moderately available.

However 30% of them believe the availability of machine in the warehouses is low. This result indicates all warehouses are not fully equipped with supporting machines. Beyond this there is shortage of spare parts and maintenance strategy in the agency for those broken mechanical machines.

Majority (42.5%) of the respondents agree that the ware houses compound is not comfortable to load and unload pharmaceuticals. But the mean value of this practice is 2.75 with standard deviation of 0.954. This result shows that most of the location of ware houses is less comfortable to pick, load and unload pharmaceutical products. This is because the agency uses rental warehouses which were not planned and built for warehousing and storage purpose.

Over all, the perception of all respondents on product warehousing and storage practices is moderate with a mean of 2.99 and standard deviation of 0.5. Therefore it can be said that warehousing and storage practices are good at PFSA. The national survey done by 2016on pharmaceutical sectoralso supports this result. The result of the survey showed that warehouses of PFSA apply 80% of warehousing and storage practices which is an acceptable range. The application of warehouse and storage practices as per the standard will contribute to improve the distribution system efficiency.

4.1.3Pharmaceuticals distribution practices

The respondents were asked to respond to the questions under each practice on a 5 point Likert scale and indicate the extent they agree with the statements that is: 1-Strongly agree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly Agree.

The overall perception of respondents on the practices under distribution system is lies on neutral scale (as shown in the table 4.3 below). This is may be due to the reason that most of the respondents were warehouse managers and face difficulty to rate hence most of these activities are controlled by officers. However when we compare the perception of employees fleet management and coordination activities with other distribution related activities, the agency is expected to make some improvements to advance the fleet management and coordination system with internal and external stakeholders.

Table 4.3 distribution practices

Distribution practice	N	Mean	Standard deviation
Fleet management and coordination	36	2.68	0.6
Distribution documents preparation	40	3.03	0.61
Loading unloading	40	2.98	0.71

When we see the perception of employees on the each practice the result is presented as follows.

4.1.3.1 Perception of respondents on Fleet management and coordination practices

Table 4.4 perception of employee on the fleet management and coordination practices

Fleet management related variables	Mean	Standard deviation
Adequate type and number of vehicles available	2.76	0.796
Transport and distribution units plan together to assign delivery vehicles	3.14	0.67
Vehicles are reserved for emergency orders	2.59	0.97
Management Information system is used to control vehicles	2.33	1.05
Vehicles are assigned as soon as requested from distribution unit	2.56	0.91
There is clear line of communication between distribution and general service unit	2.53	0.93

One of the distribution practices is management of fleet and coordination among distribution and general service units. To assess this the respondents were asked to respond their agreement to the questions under each practice on a 5 point likert scale and indicate the extent they agree with the statements that is: 1-Strongly agree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly Agree.

A mean score 0-1.5 means the respondents are strongly disagreed, a mean value 1.5-2.5 means respondents are disagreed, a mean score between 2.5-3.5 means the respondents are neutral to rate the practice and a mean value 3.5-4.5 represents the respondents are agree. Respondents are highly agreed if the mean value above 4.5.

Based on the finding from table 4.4 average of respondents were neutral to say the vehicles available are adequate or not with mean value is 2.76. The reason for this can be all employees

may not know the number of line items to be transported or did not know the volume of vehicles against the products. A qualitative result from directors and drivers below shows as there is vehicle constraint in the Agency. Considering this the agency has been procuring high volume heavy tracks.

Respondents disagree on the use of management information system (MIS) to control vehicles. The mean value is 2.33. The agency has planned to procure global positioning system (GPS) since 2015 still system is not in place. This indicates that there is no mechanism to control the movement of vehicle. Due to this may not deliver as per their schedule to health facilities. Beyond this vehicles may be used to load other than pharmaceuticals.

Even though there is continuous communication system within distribution and general service units 42.5% believe the communication system is not clear. However only 12.5% perceived that line of communication is clear. This indicates the communication system is more of informal and not in scheduled manner rather they have been plan and solving problems when they happened. This will be higher with external stakeholders.

4.1.3.2 Distribution documents preparation and usage by store managers

One of the basic activities done during distribution is preparation of different vouchers, invoices and related documents. The main documents used during distribution of pharmaceuticals are Report and Requisition format/RRF, Stock transfer voucher/STV, discrepancy report format, Stock return memo/SRM, Cash sales invoice/CSI and Credit sales invoice/CrSI. After these documents processed with officers the next activity is processing these documents in the ware houses. To assess these practices four questions were asked to respondents. The result is summarizing in the following table.

Table 4.5 Document preparation and processing in the ware houses

Document preparation and processing in the ware house	Mean	Standard dev.
Delivery documents are prepared as soon as requests come from branches	3.38	0.77
Delivery documents are prepared in such a way that all products to be loaded on a specific vehicle can be collected from a single warehouse	2.58	1.03
There is strong communication and cooperation between distribution officers and store managers	3.18	0.78
Pharmaceuticals are loaded in the same day that delivery documents arrive at the warehouse	3.03	1.0

From the above table employees highly believe that as soon as request/RRF came from branches delivery documents prepared. But considerable number of respondents (42.5%) with low mean valuedid not agree that a single document/invoiceis prepared to pick maximum number of products from a single warehouse. Only 20% agree on this issue. This is because officers who prepare delivery invoices did not exhaustively check and monitor all pharmaceuticals which are available in each ware house. This monitoring activity should be supported by computerized logistics management information system/LMIS. However the software used in the agency i.e. HCMIS did not show generate accurate data regarding the location of each pharmaceutical.Due to this drivers may not get all products from a single ware house.

4.1.3.3 Loading unloading practices

Table 4.6 loading and unloading practices

Loading unloading practices	Strongly agree, (freq/%)	Disagree (freq/%)	Neutral (freq/%)	Agree (freq/%)	Strongly Agree(freq/%)	mean	SD
Drivers have some resistance to carry pharmaceuticals as per full capacity of the vehicles?	3(7.5)	3(7.5)	15(37.5)	18(45)	1(2.5)	3.28	0.93
Vehicles are comfortable to load pharmaceuticals according to the distance of delivery sites(for short distance site pharmaceuticals will be load last)	3(7.5)	11(27.5)	14(35)	10(25)	2(5)	2.93	1.02
There is mechanism to load separately pharmaceuticals for separate health facilities	4(10)	12(30)	16(40)	7(17.5)	1(2.5)	2.73	0.96

From the above table result, 47.5% of the respondents agree that drivers have resistance to load as per full capacity of the vehicle. One of the reasons for this perception in resistance is that the agency did not apply a system to estimate volume/weight per each vehicle.Due to this vehicle utilization can be low in the agency.

Loading of pharmaceuticals separately for separate health facility based on the distance where they are located will reduce; wastage of time, mixing of products and facilitate easy delivery of the required items. Respondent gave varied answers on the comfort ability of vehicles to load pharmaceuticals as per the sites location. But high proportion (30%) of the respondents disagrees in that there is no system to load pharmaceuticals separately for separate health facilities.

4.2 Qualitative data analysis

To triangulate some of the quantitative data with qualitative data interview results from directors on over all the system of distribution, Communication with internal and external stakeholders, distribution network of PFSA and challenges, fleet management were collected. Hence drivers play great role in the transportation of pharmaceuticals. Data regarding their perception of transportation challenges and related issues were collected.

The result is organized as follows;

4.2.1 Supply chain distribution network and Communication system with stake holders of PFSA

As per the result of the interview the two directors understand pharmaceuticals distribution as the management of flow of pharmaceuticals and Vehicles from PFSA warehouses to branches and sometimes health facilities. According to them the main Challenges of pharmaceuticals distribution are: inaccurate request from branches, Shortage of vehicles, Emergency requests, Shortage of some medicines, hubs/ health facilities did not pick their forecasted amount, far apart of warehouses.

Literature also stated that the main Challenges of pharmaceuticals supply chain of African countries are poor information, communication and consumption data, inadequate storage facilities and a lack of management procedures, poor selection and quantification of demand, a lack of transparent procurement procedures, inadequate storage facilities and capacity, lack of guidelines for good storage procedures, a lack of appropriate planning, monitoring and evaluation and inadequate budget allocation (Prof. Allan Woodburn (2013)).

Also the general service manager added that low control mechanism of vehicles know how much to load and where they reach are challenges. This perception supports the results found by quantitatively.

According to the distribution and general service directors, the two directorates are closely working to allocate vehicles. Currently management of vans and heavy load vehicles are led by distribution directorate. Two general service officers are permanently assigned to work together on the management of this vehicle. General Service unit is responsible to assign drivers and to give maintenance. However the quantitative study shows 42.5% of the respondents believe the

communication system between the distribution unit and general service unit is not clear. Only 12.5% perceived that line of communication is clear. The interview result of the two directorates showed that they communicated using any time as problem occurs and when needed. But they did not mention whether there is clear communication or not.

As per the interview result of distribution unit director the communication with federal ministry of health is mostly through formal written letters. Procurement and distribution plan of some program pharmaceuticals is done through the ministry. So they send to the agency formal letters with necessary documents to the agency. Accordingly the distribution unit receives these pharmaceuticals and stores them. Products are distributed to hubs and health facilities according to the breakdown sent from FMOH. However some products will be over stocked due to less communication of inventory control system between ministry of health and PFSA. Sometimes break down from ministry may be delayed which intern results delayed distribution. Communication of regional health bureau/zonal health departments is mostly through hubs. As the director mentioned Close communication with health facilities required to avoid challenges during receiving of pharmaceuticals.

The current distribution network of PFSA organized in such a way that every procured pharmaceutical product will be transported to the central warehouse. There are seventeen branches located in different parts of the country which covers 180km-300km radius. Thus all these branches collect their commodities from head office warehouses. Some products which are imported from foreign market may be delivered directly to hubs which are near to port and along the road (eg. Dire Dawa and Samara Hubs) however the paper work should be done at central level. The local suppliers (manufacturers) also deliver their product to the central warehouse. They may also take agreement to deliver commodities to hubs based on the break down that head office do. Branches then will use two options to deliver products to health facilities these are direct delivery and delivery using woreda.

According to the distribution director most of the warehouses of the agency fulfill basic warehousing and storage principles. He perceived that the practice is good. However due to shortage of spare parts of machines, some of them are not functional. So he agreed that there is shortage of supporting machines especially in those rental warehouses.

The major work flows for distribution activity from Centre to branch;

- prepare distribution schedule for branches
- Receiving report and requisition form branches
- Check the stock status at central level and prepare Stock transfer voucher
- Consolidate transport land volume and arrange transport
- Packaging, Dispatching, scaling and signing
- Issuing, loading and delivery to hubs
- Accept and submit receiving documents

Director of distribution unit states that as they use Pull system for delivery of most pharmaceuticals, however push system can also be used for some program items. E.g. for campaign. So it can be said health facilities will the quantity they need.

According to the interview result of some product delivered lately against their schedule. This will result delay delivery of pharmaceuticals for end customers. The main reasons mentioned were shortage of vehicles, Campaign, Emergency delivery, road and climate problem and separate location of head office warehouses. To reduce this agency is in the process of buying heavy load vehicles and building off large volume ware house inside the head office.

4.2.2 Interview results collected from drivers

To assess the transportation process and pharmaceuticals distribution 31 interview papers were prepared, however Interview data was collected from 26 respondents.

These data have been analyzed by segmenting the questions into

I. Vehicle availability and who assigns drivers

Majority of the drivers did not believe the vehicles available to transportation of pharmaceuticals are enough. This result is against the perception of respondents who was engaged in the quantitative study.

All of the drivers responded that they are assigned by stock and distribution directorate however when they need maintenance for their vehicle they will communicate general service unit.

II. Loading from warehouses

Most of the drivers respond that they do not wait longer time to pick their products from the warehouses. However they will invest longer time by rotating through different warehouses to pick the products. The result strongly supports the perception of respondents in quantitative study.

III. Problems faced during transportation, receiving and communication system with general service or distribution unit

Main Problems mentioned during transportation includes;

- ✓ Traffic polices stop in different locations and ask drivers why they carry these medicines. This implies that these medicines should be handled by pharmacy professionals.
- ✓ Technical problems in the cars
- ✓ Hence they carry medicines they do not choose to sleep away from the car however some cars did not have bed.

Respondents also mentioned there are problems during unloading of pharmaceuticals at branch and health facility level. The problem is higher when the move to health facilities.

Some of the problems mentioned are;

- ✓ warehouse managers may not available in the work station
- ✓ sometimes the product and delivery invoice will not match so branches/ health facilities may not receive the remaining products easily
- ✓ less human power to unload products especially at health facility level.
- ✓ Unable to give receiving documents(common to health facilities)
- ✓ Knowledge gap to separately deliver each type of medicines as per the delivery invoice

However, when these problems are happened there is no easy way of communication with responsible body at PFSA level to solve such problems. Only telephone is used as a media of communication.

IV. Fulfillment of necessary inputs for drivers, assistant drivers and vehicle

All drivers responded that the perdiem and fuel that they receive is not enough. The process is also takes longer time.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSION AND RECPMENDATIONS

5.1 Summary of findings

The results of the study provide important insights on on pharmaceuticals distribution system at pharmaceuticals fund and supply agency. Summary findings of this research is as follows

- Employees believe warehousing and storage practices are moderately applied (mean=2.99, SD=0.5).However 48.7% of them agree that the computerized inventory monitoring system isnot applied fully.They believe there is moderate amount of human resource is available in the warehouses (mean=3.25, SD=0.74).
- Results from quantitative study shows 30% of the respondents perceived that availability of machines in the warehouses is low. Qualitative data collected from directors also supports this.
- The perception of respondents to rate the level of fleet management and coordination of distribution and general services on this area was neutral. But respondents agree that management information system to control vehicles was not in place (mean=2.33,SD=1.05). Qualitative results also support this.
- Respondents in the quantitative study believe that adequate number of vehicles are available (mean=2.76,SD=0.796). However directors and drivers perceived that there is shortage of vehicles.
- Employee believed that speed of delivery document preparation was as soon as they received a request from branches. However42.5% of respondents did not agree that a single document was prepared to pick maximum number of products from a single this was also the perception of drivers. Only 20% agree on the practice.
- Regarding the communication system between the two directors 42.5% believe the communication system is not clear. Only 12.5% perceived that line of communication is clear.Qualitative data shows there is longer weak communication between PFSA and external stake holders.

- From the employees who participated in the quantitative study 47.5% believe that drivers are resistance to load as per full capacity of vehicles. Only 15% disagreed on this.
- The main Challenges mentioned by directors in the distribution system are; inaccurate request from branches, Shortage of vehicles, Emergency requests, Shortage of some medicines, long distance among of warehouses.
- Pull delivery system is mostly used by the agency. So branches/health facilities decide the quantity of pharmaceuticals they need.
- The main reasons for delayed delivery of pharmaceuticals were; shortage of vehicles, busy on Campaign, Emergency delivery, road and climate problems are some, distance among warehouses.
- Main Problems mentioned by drivers during transportation includes;, pharmaceuticals did not handled and transported by professionals, low mechanism of communication with the agency distribution or general service unit. Management information system has not applied for vehicles.
- Main Problems perceived by drivers during delivery includes; mismatch of quantity of product and delivery invoice, less human power to unload products especially at health facility level, Unable to give receiving documents by health facilities, knowledge gap to of drivers to separately deliver different medicines to responsible health facility.

5.2 Conclusions

Based on the findings the following conclusions are drawn;

Majority of employees of the agency perceived that warehousing and storage activities are moderately practiced. However they perceived that warehouses lack fully implementation of computerized system. Mechanical machines speed up the warehousing activities, however adequate mechanical machines are not in placed.

PFSA built two new standardized warehouses but the study showed location of some warehouses is not comfortable to load and unload pharmaceuticals.

Employee of the agency believe that the number of human power in the warehouses.

Employees believed that there are challenges during transportation and delivery of pharmaceuticals as; mismatch of quantity of product and delivery invoice, less human power to unload products especially at health facility level, unable to get receiving documents by health facilities, knowledge gap of drivers to separately deliver different medicines for the respective health facility.

The Agency communicated with drivers through mobile phones however there is no management information system like global positioning system to control vehicles.

Hence the agency did not design weigh/volume based determination system of to load pharmaceuticals for each type of vehicle, drivers show some resistance to load maximum capacity of pharmaceuticals. Employees also believe that some of the challenges during transportation came due to the fact that pharmaceuticals did not handled by pharmacy professionals.

They also believe that the communication mechanism of the agency about distribution operation with internal and external stakeholders is not formal and clearly known by all employees.

Regarding delivery documents preparation they highly believed that as soon as request came from branches delivery documents are prepare. But they agreed that there is constraint to prepare delivery invoice to pick all types of pharmaceuticals from a single warehouse. Due to this vehicles invest time by rotating between different warehouses.

Even though different activities were done by the agency, employees also believe that pharmaceuticals distribution system is constrained with shortage of some medicines, Inaccurate request from lower level, Emergency delivery, road and climate problem and separate location of head office warehouses.

5.3 Recommendations

Based on the conclusion of the study the following points are recommended:-

Hence computerized system improves warehousing and storage practice the agency should fully implement computerized logistics management system in all warehouses.

The availability of mechanical machines is low, so the agency should buy additional mechanical machine. The agency shall have maintenance room hence one of the reason for shortage of machines is inability to timely maintain them. The location of warehouse affects the loading and unloading process of pharmaceuticals therefore the agency should finalize building process of the warehouse which is located inside the main office.

The agency need to develop volume determination system for its vehicles based on the basic stock keeping unit. This will avoid the resistance of drivers to fully load up to their capacity.

Due to travelling of vehicles from store to store dalliance of pharmaceuticals delivery may happen, to reduce this delivery invoices need to be prepared by officers considering to pick maximum number of pharmaceuticals from a single warehouse.

In modern supply chain Communication plays pivotal role, so the agency should develop standard operation manual which shows formal communication mechanism for internal and external stake holders.

The agency shall buy and place global positioning system/GPS to control vehicles to control its vehicles.

During transportation, Pharmaceuticals should be handled by pharmacy professionals other than drives.

Loading of pharmaceuticals separately for separate health facility based on the distance where they are located will reduce; wastage of time, mixing of products and facilitate easy delivery of the required items. So the agency shall apply partitioning practice to load pharmaceuticals.

To reduce distribution challenges which are faced during receiving the agency should work in coordination with regional health offices, woreda health offices and health facilities..

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ANNEXES

Annex I Questionnaires

ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE

DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Dears

My name is Adimasu Teketel conducting a study on the perception of employees on Pharmaceuticals Supply Chain distribution system at PFSA for the partial fulfillment of master's degree in logistics and supply chain management in Addis Ababa University, School of commerce. I would like to extend my deep appreciation to your company and you for the willingness and cooperation in undertaking this valuable research.. Taking part in this study you will contribute towards alleviating the problem of distribution system. I request your cooperation to fill and respond Truthfully for the asked Questions. If you have any question, you can contact me through 0969438530.

Thanks!

Part I: General Information and Demographic background of respondents

Please tick((✓) or Provide your own answers where applicable.

1. Gender Male Female
2. Age Less than 25 26-34 35-44 45-54 Above 54
3. Educational background Certificate Diploma Degree Masters Others (specify) _____
4. Position in the Agency Director Team leader Officer Store manager Driver Support staff
5. Years of Experience in the Agency Below 5 years 5-10 10-15 years 16-20 years Above 20 years
6. In which directorate are you working?
 - Storage and distribution
 - Human resource and General service
 - others (specify) _____

Part II: Product warehousing and storage Condition

Please rate to what degree you agree on the following warehousing and Material Handling practices in the Agency's central warehouses:

Rating scale: 1 = Very low, 2 = Low, 3 = Moderate, 4 = High 5 = Very High

S/ N	Warehousing and material handling practices	1	2	3	4	5
1	Usable and Unusable products are separated					
2	The store manager easily knows where the product is located in the warehouse					
3	There is Computerized system that facilitates picking the products					
4	The shelves and pallets of the Product in the warehouse are adequate					
5	The space between the shelves is enough for free movement of personnel and products					
6	Picking products doesn't take too much time					
7	There is adequate human power to load and unload pharmaceuticals					
8	The warehouse has enough space to store the products					
9	Machines are available for loading and unloading					
10	The warehouse area is comfortable to load and Unload the products to and from vehicles					

Part III: Distribution Practices

Please rate to what extent you agree on the following Distribution practices of the Agency.

The scale below will be applicable: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree

5 = Strongly Agree

S/N	Distribution practices	1	2	3	4	5
1	Good Fleet management and coordination					
1.1	Adequate type and number of vehicles available					
1.2	Transport and distribution units plan together to assign delivery vehicles					
1.3	Vehicles are reserved for emergency orders					
1.4	Management Information system is used to control vehicles					
1.5	Vehicles are assigned as soon as requested from distribution unit					
1.6	There is clear line of communication between distribution and general service unit					
2.	Pharmaceuticals Distribution documents preparation and					

	communication					
2.1	Delivery documents are prepared as soon as requests come from branches					
2.2	Delivery documents are prepared in such a way that all products to be loaded on a specific vehicle can be collected from a single warehouse					
2.3	There is strong communication and cooperation between distribution officers and store managers					
2.4	Pharmaceuticals are loaded in the same day that delivery documents arrive at the warehouse					
3.	Loading Unloading issues					
3.1	Drivers have some resistance to carry pharmaceuticals as per full capacity of the vehicles?					
3.2	Vehicles are comfortable to load pharmaceuticals according to the distance of delivery sites(for short distance site pharmaceuticals will be load last)					
3.3	There is mechanism to load separately pharmaceuticals for separate health facilities					

Part IV: Interviews questions for directors of the agency

1. How do you define Pharmaceuticals distribution system based on the context of your Agency?
2. What are the major challenges and opportunities of pharmaceutical distribution in Ethiopia?
3. What is your directorate's communication mechanism with other directorates who works on distribution and fleet management ?is this hierarchical or by cooperation?
4. How your agency communicates, integrate and coordinate with external organizations like MOH, National health program unit, regional health bureau/zonal health departments, health facilities?
5. Would you describe pharmaceuticals supply Chain distribution network of PFSA?
6. Major work flow for distribution sub process form center to hub s?)
7. What is your perception on' do warehouses and storage condition practices are good in PFSA Warehouses?

8. Do you believe that there is delay in distribution pharmaceuticals to your immediate customers? If yes, why this happens? And what efforts your agency made to reduce the delay

9. Which delivery method do you applied? Push or Pull system

Part V: የመድሃኒት ስርጭትና ስምሪት አሰራር ንብተመለከተ የሚጠየቁ የቃል ጥያቄዎች (በአሽከርካሪዎች የሚመለሱ)

1. በኤጅንሲው ውስጥ ስርጭት አገልግሎት የተመደቡት መኪናዎች በቂናቸው በለው ያምናሉ?

2. እርስዎን ስርጭት ስራ የሚመድብ የታከፍ ልዩነት ናቸው?

3. የስርጭት ሰነዶችን ይዘው ወደ መድሃኒት መጋዘኖች እንደ ደረሱ ይስተናገዳሉ?

4. በተቁ 3 ለተጠየቀው ጥያቄ መለስ ያልሰተና ገደም ከሆነ ለስንት ቀናት ይጠብቃሉ?

5. ለእርስዎ ፤ ረዳት ያሉን ዲህ-ምለ መኪናዎች አሰፈላጊው ግብአቶች (እንደ አቦል፣ ነዳጅ) በጊዜው ይሟላሉ ወይ? ችግር አለ ካሉ ቢጠቅሷቸው::

6. እርስዎ መድሃኒቶችን ጭነው ወደ ቅርንጫፍ ሲሄዱ ከስምሪት ክፍሉ ጋር የግንኙነት ስርአት አላችሁ? አለ ካሉ እንዴት እንደሆነ ቢገልጹት?

7. መድሃኒቶችን ጭነው ወደ ቅርንጫፍ ወይም ጤና ተቋማት ሲሄዱ መንገድ ያላይ ችግሮች ያጋጥማሉ? ካሉ ቢገልጹቸው

8. መድሃኒቶችን ጭነው ወደ ቅርንጫፍ ወይም ጤና ተቋማት ከደረሱ በኋላ በግብአት ስርአት ላይ ችግሮች አሉ? ካሉ ቢገልጹቸው;

9. በእርስዎ እይታ በከምችትና ስርጭት አሰራር ዙሪያ አሉ የሚሉ ጥያቄዎች ስርጭት ስምሪት ላይ ችግሮች ስህተት ሆኖ ቢገልጹልኝ?

10. በእርስዎ እይታ የከምችትና ስርጭት አሰራር ንብተመለከተ መደረግ አለባቸው የሚሉ ጥያቄዎች ስህተት ሆኖ ቢገልጹልኝ?