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SCHOOL OF COMMERCE

FACTORS AFFECTING THE FAMILY PLANNING COMMODITIES SUPPLY CHAIN MANAGEMENT PERFORMANCE IN SELECTED PUBLIC HEALTH FACILITIES IN ADDIS ABABA

By Biru Sima (GSR/1401/13)

A thesis submitted to the School of Commerce, Addis Ababa University in partial fulfillment of the requirements for the Degree of Master of Arts in Logistics and Supply Chain Management

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FACTORS AFFECTING THE FAMILY PLANNING SUPPLY CHAIN MANAGEMENT PERFORMANCE OF SELECTED GOVERNMENT HEALTH FACILITIES IN ADDIS ABABA HEALTH BUREAU

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Declaration

I, Biru Sima Soboka declared that a thesis entitled with “Factors Affecting The Family Planning Supply Chain Management Performance Of Selected Government Health Facilities In Addis Ababa Health Bureau” is my original research work and have never been submitted to any other university for any Diploma or Degree. I also declare that all the resources used under this research has been acknowledged clearly.

Name_____

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Certification

This is to certify that a research under taken by Biru Sima under my advising entitled with: “Factors Affecting The Family Planning Supply Chain Management Performance Of Selected Government Health Facilities In Addis Ababa Health Bureau” submitted to the AAU in partial fulfillment of the requirements for the Degree of Master of Arts in Logistics and Supply Chain Management complies with the regulations of the Addis Ababa University and meets the accepted standards with respect to originality and quality.

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Signature_____

Date_____

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List Of Acronyms

AACAHB	Addis Ababa City Administration Health Bureau
CPR	Contraceptive Prevalence Rate
DSM	Drug Supply Manager
DHIS-2	Demographic Health Information System
ECLS	Ethiopian contraceptive logistics system
EML	Essential Medicines List
eLMIS	Electronic logistics management information system
EPSA	Ethiopian Pharmaceutical Supply Agency
FP	Family Planning
PLMP	Pharmaceuticals Logistics Master Plan
FP SCM	Family Planning Supply Chain Management
IFRR	Internal Facility Report and Resupply
IPLS	Integrated Pharmaceutical Logistic System
LMIC	Low and Middle Income Countries
LMIS	Logistics Management Information System
MDGs	Mellinium Development Goals
MOH	Ministry Of Health
NPPL	National pharmaceuticals procurement List

PFSA	Pharmaceutical Fund And Supply Agency
PSCM	Pharmaceutical Supply Chain Management
RMNCH	Reproductive Maternal, Neonatal, Child Health
RRF	Report And Resupply Form
SCM	Supply Chain Management
SDP	Service Delivery Points
SOH	Stock on Hand
TFR	Total Fertility Rate

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ABSTRACT

Background: The pharmaceutical supply chain management system of the Ethiopia had several problems including non-availability, poor storage, weak stock management and irrational use. Therefore, this study aimed to assess Factors Affecting The Family Planning Commodities Supply Chain Management Performance In in Selected Public Health Facilities In in Addis Ababa. Methods: A cross sectional quantitative and qualitative studies were conducted in selected health facilities from June 10- 30 , 2022. The calculated sample size was 64 health facilities calculated for a 10% margin of error and 90% confidence interval.. Results: The average availability of bin cards for the selected products was 94% for all Health Organizations, and On average, HFs had an updated bin card for 92.8% of the product. Most of the health facilities use bin cards as their data sources for their demanding and reporting while the others were using previous RRF reports and combination of both. Conclusion: There have been significant improvements on factors affecting FP pharmaceuticals SCM in the availability of FP commodities since IPLS has been implemented, with some variation by level of commitment by the professionals. Improving all factors affecting the SCM of family planning pharmaceuticals is necessary to sustain the supply of pharmaceuticals.

Keywords: Integrated pharmaceutical logistics system, FP, SCM, AACAHB

CHAPTER ONE

INTRODUCTION

The contents of this chapter has different sections and sub-sections. It has tried to be explained as follows by starting from the background of the study.

1.1 Background of the study

Family planning is the control of the number of children in a family and of intervals between them, especially by the use of contraceptives. Contraceptives are drugs those that are used to place the birth of children at the required time and schedule as well as make birth far apart. In order to have a sustained improvement in the family planning service coverage and quality service the availability of contraceptives is critically important. It is the contraceptive logistics system that is responsible for getting the contraceptives from the central level to the family planning client (Mohammed et. 2006).

Family planning supply chain management encompasses a number of activities along the supply chain, such as transporting and storing the contraceptives, maintaining adequate supply levels and keeping records(Mohammed et. 2006).

The history of family planning is long and complicated. It dates back to the earliest days of human kind. There has never been a time when women and girls didn't want to have control over whether when and how many children they would have(MOH, 2012).

A. Global and African trend

Eventhough FP coverage is increasing world wide, in the countries of sub-saharan Africa and other developing countries, the prevalence of contraceptive use remains low and the unmet need for the FP is high (Tigist, et. al,2020). Reducing unmet need for modern contraception by increasing access and supply of contraceptives has been a critical area of interest in the reproductive health field for decades and is key to meeting the FP 2030 goal of giving 120 million more women to utilize modern contraception. From July 2012 to July 2015, 24.4 million more women and girls were able to use modern contraception; however, that is 10 million fewer women and girls than it had hoped to reach at that time. Establishing and maintaining well-functioning supply chain systems and management that address the needs of public and private sectors and health professionals at all levels, including community health workers(CHWs) in family planning (FP) programs, will play a critical role in addressing the challenge of unmet need for modern contraception in low and middle-income countries (LMICs)(Ali,et2017).

The number of married women who either use contraceptives or who have an unmet need for FP was expected to increase from 900 million in 2010 to 962 million in 2015, much of this growth taking place in developing countries. Moreover, in 2015 availability of contraceptives increased in 11 countries, but decreased 12 countries with the most commonly cited issues being related to supply-chains. Three types of contraception were only offered at rural service delivery points (SDPs) 85% of the time in 16 out of 32 countries surveyed, further demonstrating the continued need to evaluate access and supply chains for FP and contraception programs. The projected growth in demand in many LMICs will result in substantially increased contraception use, straining an already-inefficient supply chain system that is unable to keep pace with the growing need. It is crucial for FP and contraception programs to secure reliable, predictable and long term funding to match increased demand, but it is equally important to develop and establish reliable end-to-end supply chain systems that focus both on moving products from one place to another and on satisfying clients' contraception needs. The principal goal of an efficient supply chain system is ensuring that needed goods and services reliably reach the end user/client. Glaring insufficiencies continue to exist in primary health centers as well with the UNFPA finding in 2015 that of 32 LMICs surveyed, only 19 reported 85% of primary health centers having three or more forms of contraception, a decline from 22 countries 2014. In addition, the UNFPA has found that lack of trained staff hampers the availability of many LARCs as contraceptive options negatively affecting access to FP and contraception uptake. Efficient supply chains enhance quality of care and support choice of modern contraception methods by reducing stock outs of contraceptives and related medical equipment (Ali,et. 2017).

Stock outs of popular contraceptive products are common and persistent across many countries. A review of supply chain challenges in low and middle-income countries (LMICs) concluded that various inefficiencies and bottlenecks across the supply chain contribute significantly to high stockout rates for modern contraceptives. Establishing and maintaining effective supply chain management is essential to making modern contraceptives available and thus helping individuals achieve their reproductive goals. Supply chain management organizes the vast network of supply chain players procurers, manufacturers, shippers, distributors, warehouse agents, facility managers and service providers in a system to ensure timely delivery of products from the port of central and sub-national warehouses and ultimately to service delivery points and end users (Ali,et. 2017).

Ethiopia's trend

The service was started in Ethiopia in 1966 by Family Guidance Association of Ethiopia, non-governmental and non-profit association to provide information, counseling & clinical services to families

who voluntary express their need & desire for spacing the birth of their children. The services were limited to a small, one-room clinic (in Addis Ababa),ran and managed by a single nurse which gradually expanded to a number of facilities throughout the country with the involvement of the Ministry of Health (Mohammed et.2006).

Beginning from the time it had embarked the demographic health survey report has indicated that contraceptive coverage has increased from 6.3% in 2000 to 36% in 2019 among married women in Ethiopia. In the national survey of 2011, 25% of women surveyed did not want to have children in the near future pregnancy although they were not using any form of contraceptives. This is because FP utilization is affected by many factors in low income settings, such as socio-cultural norms in which men dominate decision making because of the lower social status of women, education, residency and income (Tigist, et. al,2020).

1.2 Statement of the problem

Although, Ethiopia has achieved exemplary successes in terms of family planning services, the government of Ethiopia (GoE) is committed to meeting the millennium development goals(MDGs) and has a country level population goals of a total fertility rate (TFR) and contraceptive prevalence rate of(CPR) of 65% by 2015, while the commitment remains strong, the challenge of meeting MDG is a reality as Ethiopia has an estimated total population of 100 million currently. The population growth rate in Ethiopia has however declined from 3.1% per annum in 1984 to 2.6% in2007. Nearly half (46.2%) of the population is under 15-years of age and notably, significant number of women are within reproductive age (15-49 years). From these the numbers of women in reproductive age will rise as the women under 15 years of age will increase in to reproductive age (MOH, 2012).

Additionally the logistical challenge of supplying these women with FP poses a challenge as 83% of the population lives in rural areas. Fertility is still high in Ethiopia with TFR of 4.8 overral- urban TFR 2.6 and rural TFR 5.5. the contraceptive prevalence rate (CPR) for any method, modern and traditional among currently married women in Ethiopia aged from 15-49 years increased from 15% in 2005 to 27.3% in 2011 (MOH,2012).

The following challenges were observed in FP supply chain as well as other health commodities performance;

- Data quality problems,
- Poor top management commitment ,

- Delay in placing an emergency order,
- Inappropriate use of internal facility report and resupply form
- Poor storage,
- Weak stock management,
- Non-availability and
- Inappropriate implementation of DAGU (a term taken from language of Afar Ethiopia and it is a means of exchanging information at that region) (Alemu, et.al,2020).

Interruption of supplies and stock outs FP commodities decrease the performance of FP services (AACAHB, 2019). Hence, the purpose of this study is to assess the factors affecting the FP SCM performance which helps health managers to make evidence-based decision to withstand the burden that comes due to new strategy on supply system particularly and achieve the 2030 targets in general.

1.3 Research Questions

- What are the major external factors affecting FP logistics supply chain?
- What are the major internal factors affecting FP logistics SC?

1.4 Objectives of the study

1.4.1 General Objective of the study

The general objective of the study is to assess factors affecting the FP logistics Supply chain management performance in selected public hospitals and health centers in Addis Ababa.

1.4.2 Specific objectives of the study

The specific objectives of this study will be explained by listing the following assumptions

- To assess the effect of top management commitment on FP logistics SCM
- To assess the effect of information sharing and flow on FP logistics SCM
- To assess the effect of information technology on FP logistics SCM
- To assess the effect of consumers demand on FP logistics SCM
- To assess the effect of human resource management on FP logistics SCM
- To assess the effect of culture on FP logistics SCM
- To assess the effect of religion on FP logistics SCM
- To assess the effect of company environment on FP logistics SCM
- To assess the effect of mutual understanding and trust on FP logistics SCM

- To assess the effect of education and training on FP logistics SCM &
- To assess the effect of supply chain relationships on FP logistics SCM.

1.5 Definition of Terms

1.5.1 Conceptual definition

Supply chain management: it includes the planning and management of all activities involved in sourcing and procurement and all logistics management activities. Supply chain management is the coordination of production, inventory, location, and transportation among the participants in a supply chain to achieve the best mix of responsiveness and efficiency for the market being served (JSI, 2017).

Supply chain management performance:- it deals with how planning and management activities involved in sourcing and procurement and all logistics management activities are implemented and on what stage and to what extent their situation is undergone (PFSA 2017).

Integrated Pharmaceutical Logistics system (IPLS): is 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 fulfil 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, 2017).

Logistics Management information system (LMIS): is a system to collects, organizes, and reports data that enables people to make logistics decisions (PFSA, 2017).

Inventory Control System: is a system designed to inform personnel when and how much of a pharmaceutical to order and to maintain an appropriate stock level to meet the needs of patients (PFSA, 2017).

1.5.2 Operational definition

Family planning: is the control of the number of children in a family and of intervals between them, especially by the use of contraceptives.

Reporting and Requisition Form (RRF): is a form used to report and ordering program drug including FP supplies every two months at Hospital and Health centers in Ethiopia (PFSA, 2017).

Distribution: the refilling of FP commodities from immediate supplier to health facilities and within facilities. It doesn't include the central EPSA distribution. The transportation raised here is within this distribution only (PFSA, 2017).

Internal Facility Report and Resupply form (IFRR): is the form by which drugs is issued within the facility to maintain a record of the products that are issued and received (PFSA, 2017).

Stock out: when the product is not available in Health Facilities dispensing units and in store for greater than three days in the last six months and at the day of visits (PFSA, 2017).

Refill time: the time interval in which RRF is reported and PFSA delivers products to Health facilities. The ideal set is three weeks (PFSA, 2017).

On time report: Health Facilities send RRF to PFSA before 10th days in the reporting period (PFSA, 2017

1.6 Significance of the study

The ultimate goal of every public health supply chain is to improve the public health outcome. Supply chain also determines the success or failure of any public health program. So the intention of this study is to point out factors affecting family planning commodities availability so that the community will not miss the pharmaceuticals they need. Moreover it will give additional input to know the status of FP logistics SCM, so that the required bodies like governments and NGO will own the tangible knowledge so that they will be able to demand and supply the required amount of logistics. Besides this the academicians may stand on it and enhance their research on this area.

1.7 Delimitation/scope of the study

This study was designed to undergo the status of family planning commodities in health facilities that are found in Addis Ababa. The study has designed to cover 64 health facilities that are government owned. Accordingly the cited number of health facilities' professionals that have direct contact with family planning drugs had been contacted.

1.8 Organization of the paper

In first chapter general information about the study including introduction, statement of the problem, objectives, scope of the study and operational definitions have been discussed. In second chapter review of related literature which include theoretical and empirical literature review and conceptual framework of the study have been elaborated. The third chapter have discussed on methodology of the study. The fourth chapter have discussed about results, discussion and interpretation. Final chapter is talking about conclusion and recommendation.

CHAPTER TWO

2. LITERATURE REVIEW

2.1 Introduction

Eventhough FP coverage is increasing world wide, in the countries of sub-saharan Africa and other developing countries, the prevalence of contraceptive use remains low and the unmet need for the FP is high. The situation in Ethiopia is similar. According to demographic health survey report, contraceptive coverage has increased from 6.3% in 2000 to 36% in 2019 among married women. Nevertheless the unmet need is estimated to be more than 16%. In the national survey of of 2011, 25% of women surveyed did not want to have children in the near future pregnancy. However they were not using any form of contraceptives. FP utilization is affected by many factors in low income settings, such as socio-cultural norms in which men dominate decision making because of the lower social status of women, education, residency and income (Tigist, et. al,2020).

2.2 Theoretical Review

The main components of PSCM system are selection, Quantification, Procurement, Inventory management, Storage and Distribution and Customer use. Management support is also an integral to each component of the cycle. The following figure indicates how the transaction and movement of FP drugs takes from product selection to serving the customers.The Chartered Institute of Procurement and Supply (CIPS) defines supply chain management (SCM) as:"…the handling of the flow of goods and services from the raw manufacturing of the product through to the consumption by the consumer."The supply chain is itself defined as:"…a channel of goods distribution, which starts with the supplier of raw materials or components, moves through an operational process to the distributor and retailer, and finally to the consumer(MOH, 2017)."

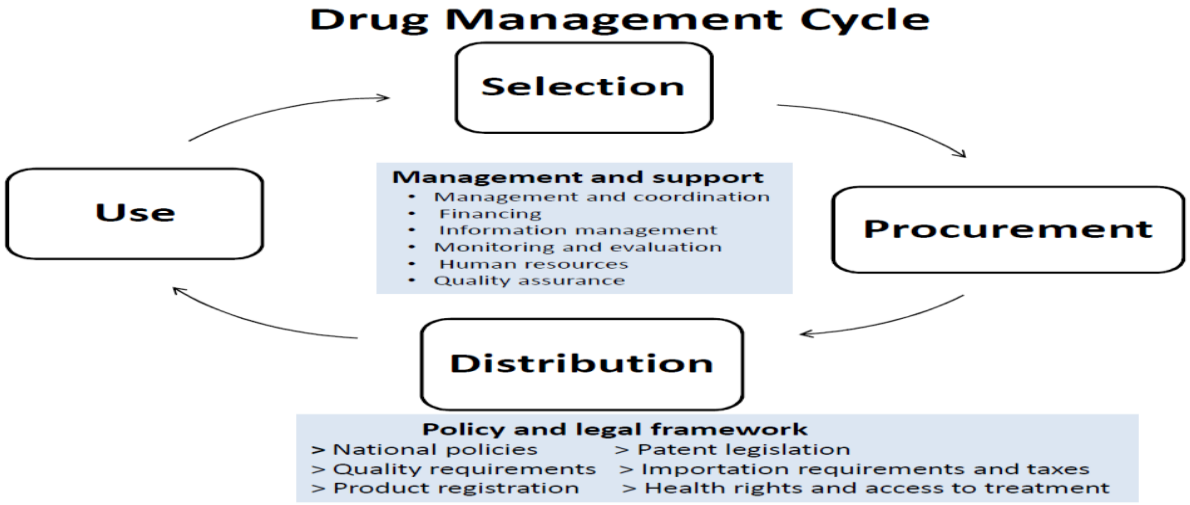


Fig. 1 Indicating the FP products SCM cyle (MOH, 2011)

2.2.1 Selection

Discussion of selection is not required here. Because list of FP pharmaceuticals are already known.

2.2.2 Quantification

Consumption data is an important factor in determining quantification needs. Some procurement agents use distribution data, but this can be inaccurate as not all medicines distributed from the Central Medical Stores (CMS) to the health facilities are put into use. Other factors used are seasonal variations when disease pattern vary throughout the year. Morbidity data is often used

to do forecasting when setting up a new procurement office. Many parameters have to be taken into consideration to avoid cash being tied to stock or out of stock situations. When procuring for a CMS to be distributed to health facilities, the following have to be considered:

- Available financing
- Stock on hand at all levels of distribution system
- Orders that are expected to be delivered
- Expected losses through expiry or damage
- Medicines donations
- Desired stock at end of each planning period (safety and working stock at all levels)

2.2.3 Inventory control system

An inventory management system (or inventory system) is the process by which you track your goods throughout your entire supply chain, from purchasing to production to end sales. It governs how you approach inventory management for your business. All products are re-supplied each time a report is completed. In emergencies, an emergency order can be placed. Health centers and hospitals calculate their own order sufficient quantities of FPs along with other programs to bring stock levels up to the maximum level, and required to report and order every two months (MOH- 2011).

Any venture that handles stock will need a system to accurately track and control it. Without one, you'll be working on an entirely ad-hoc basis and you'll quickly run into situations where your business is overstocked or understocked (MOH- 2011).

2.2.4 Storage and Distribution

The final step in the supply chain is when your product is received by customers, either from store shelf or through direct shipping. For products to reach their final destination, supply chain distribution must be well planned. Implementing logistics software into your company for employees to learn or outsourcing a third-party logistics (3PL) company will ensure products are handled properly so that they may reach customers quickly which is the goal of a distributor. Proper storage of FP commodities, is critical to maintain the quality of the medicines and related supplies. Central EPSA will deliver the pharmaceuticals to hubs; subsequently the hubs

distribute the pharmaceuticals to health facilities every two months based on orders placed by the health facilities to EPSA hubs. Health facilities are expected to follow consumptions and keep record regularly. They get FP medicines and related supplies if they submit their report and order, using Report and Requisition Form (RRF) with accurate data and in a timely manner. The logistics data for the RRF should always come from bin cards and IFRR or DAGU-2 software if the health facility is DAGU site. The quality of this data is very crucial as it will be used for quantifying future consumption (PFSA, 2017).

As elaborated earlier the supply chain ends when the product or service is delivered to the customer. However, delivering the product or service means having a well-planned and managed distribution and logistics organisation. Most companies today use logistics software to manage the shipment process, whether they handle it on their own or outsource to a third-party provider (PFSA, 2017).

Figure 2: Flow of Family planning Commodities and Information, Taken from MOH, 2011.

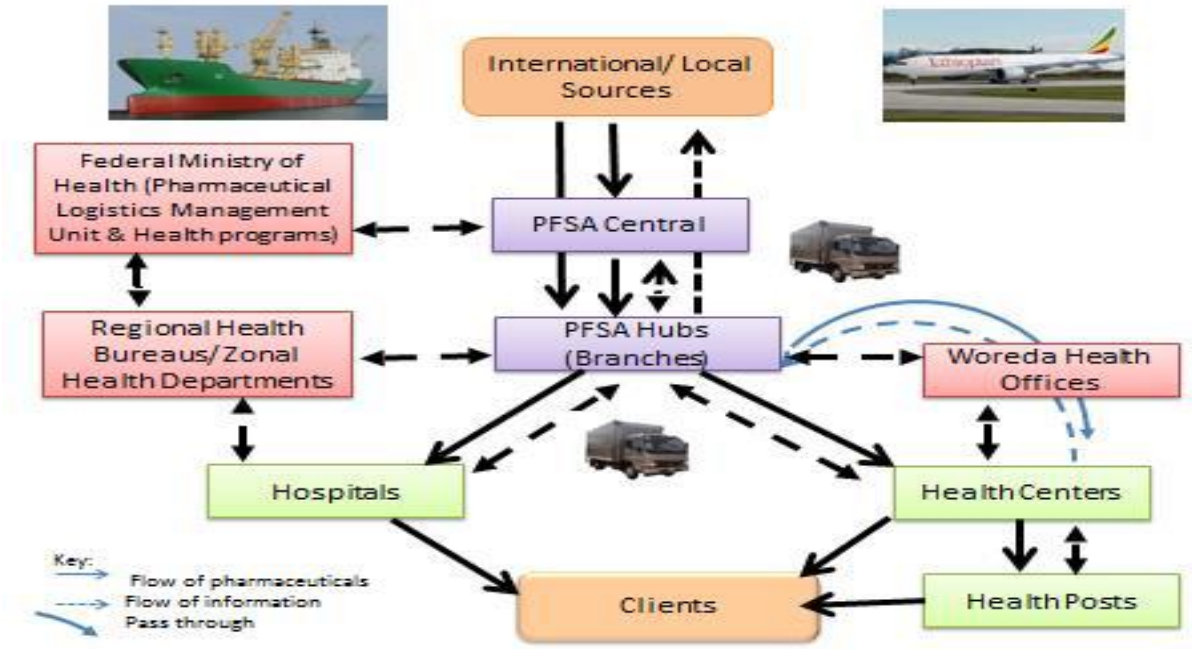


Figure 2: Flow of Family planning Commodities and Information (MOH, 2011)

2.2.5 Logistics management information system (LMIS)

A LMIS is the system of physical and technology-based records and reports that supply chain workers and managers use to collect, organize, present and use logistics data gathered across all levels of the system. An effective LMIS depends on the right combination of people, processes, and technology. Skilled people must record, analyze, manage and use supply chain data at every level. The LMIS must enable efficient business processes and workflows forecasting, inventory management, distribution planning, reporting and ordering, order fulfillment, temperature monitoring, equipment maintenance, performance monitoring, etc. and incorporate routine data management processes. And the LMIS must leverage appropriate technology that is feasible to deploy and sustain, and is embraced by users at each level (MOH 2011).

The current pipeline has five levels. Products flow from the central Pharmaceutical Fund and Supply Agency (PFSA) down to the regions; from the regions to the zones (where they exist), then to woredas, and finally to the service delivery points. Information flow follows the same line, but from the service delivery point upward. Health facilities are expected to send bimonthly logistics management information system (LMIS) reports to their respective woredas. At the woreda level, these reports should be compiled and sent to the zones (regions); from the regions, the reports go to the central-level quarterly. Using these reports, the higher level is expected to resupply the lower level of the system with the required FP commodities. In 2007, a new LMIS was designed, and according to this system, the PFSA is expected to deliver health commodities directly to health facilities and collect LMIS reports from the health facilities. The new LMIS, which is expected to be functional at the end of 2011, is designed in such a way that logistics information is collected and reported for decision making on resupply planning, as shown below.

A combined order and report form should be completed by Health Centres and Hospitals and sent to the PFSA for order processing every other month. The Health Centre order should include the commodity requirements of the Health Posts.

A copy of the Health Centre report and order and a copy of each Health Post report should be sent to the Woreda Health Office for management and supervision purposes, and a copy of the Hospital report and order is also sent to the Regional Health Bureau for the same reason.

The Woreda Health Office should aggregate logistics data from the Health Centres and send aggregated reports of logistics data to the Regional Health Bureau.

The PFSA resupplies the health facilities with the required contraceptive commodities, based on the reports collected from health facilities and feedback from the Regional Health Bureaus. The overall information system also includes a mechanism for higher levels to provide feedback to the respective lower levels. In the feedback reports, facilities will be able to see how they are performing compared with other facilities in their geographic area (MOH 2011).

2.3 Challenges of FP commodities SCM

Internal factors

2.3.1 Human resource management

Describes that every man, bearing in mind their wishes and possibilities, selects occupation and any organization, keeping in mind the requirements of the environment and available resources will decide how to set up its organizational structure, define jobs and develop recognizable culture. Formation of certain structures of the company, except for activities with which it deals, depends on the willingness of old employees to adapt to environment changes and the readiness of new staff to embrace the culture of the organization. If appropriate organizational structure is established, its individual members and team activities can create a stimulating and pleasant environment, to educate, adjust and to reach their goals. Human Resources Management (HRM) as a business function encompasses the duties and tasks related to the people, their acquisition, selection, training and other activities that ensure the development of employees. The goal of human resources management is to help the company reach its strategic goals. The basic assumption of human resources management is that people are not machines and therefore we need an interdisciplinary approach for observant people in their work environment. From the manager is requested to respect the essential characteristics: trust, decentralization and distribution of information and knowledge, education, clear roles and responsibilities, freedom of action, feedback, motivation and resources necessary for action. Framework of action consists of business priorities and objectives that need to know all the employees. Managers are bond between employee and company and exercise their functions in order to achieve the integrity of the system and achieve the satisfaction of the people and the aim of the company. Human Resources Management includes the actions, organizational procedures and plans that affect the behavior, attitudes, organizational culture and achievements of staff in the business system in a

way that increases the productivity of workers, their flexibility and capacity for creating competitive advantages that are difficult to copy in the short term (Jafri, S. and Shukla, P. 2018).

- Human Resource positively and significantly affects the FP commodities supply chain management performance

2.3.2 Education and training

Supply chain managers need skills in project management, cost accounting, and e-business or e-procurement systems. They should also have international awareness, good business ethics and an understanding of legal agreements. Since supply chain management can encompass working across same and in many different cultures, soft talents like effective presentation, communication and multicultural understanding are also significant. The achievement of these abilities comes from both formal education and on-the-job training.

- Education and Training positively affects FP commodities Supply Chain Management Performance

2.3.3 Top management commitment

Top Management has an important role to play in effective supply chain coordination. It has the mandate to determine the staff to be recruited and to define the organisational structure to accomplish mutual goals. The scholars reiterated that Top Management should provide adequate resources and financial support for building an efficacious system to prioritise SCM implementation. However, without good governance and transparency among civil servants, politicians and policy makers in the flow of information regarding medical products, it may not be possible to realise the public sector supply chain outcomes. The scholar further contends that leaders should be accountable, measure performance, build staff capacity, encourage cross-functional training, and steer managers and other relevant staff involved in policy management and achievement of organisation's vision and mission. Supply chain leader must have leadership skills, blended with technical knowhow, garner participation from a vast number of stakeholders and lobby for political support. Above all, such a person should be a change agent, seek for new opportunities within the existing systems and where applicable, change the whole landscape within the existing laws (Oluka et, 2019).

- Top management commitment positively affects the FP commodities supply chain management performance.

External factors

2.3.4 Company Environment/Organizational Factors

Organisational factors can either be vertical or horizontal. The former are characterised by hierarchy and bureaucracy where power flows from top to bottom; while the latter stresses specialisation and participation. Other organisational structures can be decentralised, flat and flexible because employees are granted more responsibilities for their tasks. The nature of organisational structure determines the coordination dimensions. Therefore, if the structure is hierarchical, the coordination is from top to bottom; while a horizontal structure attracts specialised skills requiring flexible dimensions. The coordination mode may also take any of the two aspects: how information is shared (information capability); and using authority to make administrative decisions along the supply chain (Oluka et, 2019).

- Environmental uncertainties negatively and significantly affects the FP commodities supply chain management performance

2.3.5 Information sharing and flow

Information sharing is basic to effective coordination in a supply chain. Many studies have found that information sharing has great impacts on supply chain performance, especially in reducing the bullwhip effect. Information sharing enables companies to make better decisions in their operation leading to better resource utilization and lower supply chain costs. Better management of information allows companies to be more responsive to customers' demands. Advances in information and communication technology (ICT) enable companies to share information. For example, the Internet allows organization to transfer digital data instantly and with high fidelity at nearly zero marginal cost. Information and financial flows are also important and govern physical flows. A supply chain can also involve third parties that provide logistics activities (Beaumont N. and Baihaqi I., 2018).

Electronic drug management system like DAGU and HCMIS and its interactive influence with products availability; Rxsolution and its influence on products availability; information on stock

cards and its potential to improve availability of pharmaceuticals; sharing of stock status and its influence on availability of logistics; timely information pinned on notice boards and its ability to improve availability of products, and finally the use of hardcopy reports regarding pharmaceuticals like FP items and their ability to improve availability of them. The main objectives of a good logistics management information system (LMIS) includes: improved implementation of an efficient information systems for accurate reporting on what is supplied, consumed and wasted. It should be able to gather data, organise it, analyse and report accurate, timely and appropriate information to decision makers so as to evaluate the how supplies flow, account for products, reducing supply imbalances, and improve efficiency (PFSA, 2015).

- Information Sharing and Flow positively affects supply chain management performance

2.3.6 Mutual Understanding and Trust

Mutual Understanding was linked to appreciation of organisational goals and building of trust among supply chain members. In an empirical examination of strategy frameworks, studies have found out it is not only important for employees to understand the goals but how to contribute to the organisation's strategic goals was more crucial. “It appears that employees who understand how to contribute to an organisation's strategic goals are more likely to feel a sense of belonging (or fit), perhaps since they are better able to work in alignment with the firm's needs, while this is not necessarily the case for employees that are aware of the strategy but not necessarily know what to do about it”. It had hypothesised that drugs’ availability will be enhanced when employees at all levels share assumptions, beliefs and values that are aligned with strategic goals and capabilities. Successful implementation of supply chain activities requires members to mutually understand each other, plan jointly, and agree on effective implementation dimensions to deliver the required services and products. Trust is critical in highly interdependent supply chains. Therefore, when trust is established, joint forecasting of demand becomes possible between partners. This eases modification of orders whenever necessary and minimises frequency of stock-outs) argues that while shared knowledge or shared understanding is important, it may not be sufficient to bring about the desired performance among supply chain actors, especially in the absence of shared goals and mutual respect among actors. Therefore, scholars have not fully illustrated how shared understanding at the micro-, market- and macro-

environments can be achieved to bring about availability of products and reduce stock-outs in the public health facilities (Oluka et, 2019).

- Mutual understanding and Trust positively affects supply chain management performance

2.3.7 Information technology

There are many impact of it on supply chain management to make a business more efficient. One way is to streamline the process of tracking and distributing inventory. But the biggest benefits of technology in supply chains Management come from reducing costs, improving customer service, and increasing operational efficiency. The role of information technology on supply chain management is enormous. It has created a competitive advantage for the companies that are using the latest technologies. It has also provided a platform for the development of new products and services. The advantages of information technology on supply chain management is also driving down the costs of operations and increasing the efficiency of the processes.

- Information Technology positively affects supply chain management performance

2.3.8 Supply chain relationships

There are two main types of supplier relationships. Identifying which type of relationship you have with your suppliers will help to effectively manage your expectations and align mutual business objectives. In a vertical supplier relationship, the supply chain is linked in the traditional way between sellers and buyers. Each party places emphasis on ensuring individual and supply chain goals are achieved. Examples of vertical supplier relationships include distributors, retailers, manufacturers, and suppliers. These relationships are often involved frequently, with many providers operating together day-to-day. On the other hand, horizontal relationships are those that are created between organizations that work in conjunction. For example, the supplier for brake pads and the manufacturer of tires both provide parts to the car manufacturer. These suppliers work together to achieve mutually agreed-upon goals, and therefore they partake in a horizontal supplier relationship. Horizontal supplier relationships are built on a foundation of mutual trust and shared risk. With each party specializing in their specific aspect, the integration of their processes leads to shared success.

Many firms have directed significant attention toward working more closely with supply chain partners, including not only customers and suppliers but also various types of logistics suppliers. Considering that one of the fundamental objectives of effective supply chain management is to achieve coordination and integration among participating organizations, the development of more meaningful "relationships" through the supply chain has become a high priority.

Supply chain relationships in general, with an emphasis on the types of relationships, the processes for developing and implementing successful supply chain relationships, and the need for firms to collaborate to achieve supply chain objectives.

Generally supply chain relationships are the substances that will carry the logistics industry into the future.

- Supply Chain Relationship positively affects supply chain management performance

2.3.9 Consumers demand

Consumers in the past usually had no influence on the supply chain, because they didn't know anything about it. But today through IPLS health organizations and professionals within health facilities demand their products by RRF and IFRR respectively. Accordingly health facilities have their own schedule at which they demand their required commodities.

- Consumers demand positively affects the FP supply chain management performance

2.3.10 Cultural factors

As Addis Ababa is a place of habitat (settlement) for different nation and nationalities there are societies that believe that children are growing with their fate or chance. So these group of socities believe that counting the number of their children is counted as a bad norm. These group of society believe that counting the number of their kids are not good and they answer as if it is a number of sand or teff grain. On the contrary there are elite group of people who have sophisticated attitudes in this area so that using contraceptives are critically important so that the children can grow in well and confortable attitude.

In some cases though, the denial of women's reproductive health and rights can be traced to cultural beliefs, such as son preference in India. There is a tangible connection between cultural practices and religious beliefs about women as cultural beliefs are further strengthened by

religious views of women as subordinate or inferior in religion. In such cases, sources of opposition to contraception lie both outside and within the household and community. A study conducted amongst groups of Muslim and Hindu women in India found that Muslim women were more likely to believe that using contraception was not permissible in Islam, and that children were "gifts from God". At the same time, Muslim women opposed sterilisation more than traditional methods or birth control pills (Salam GR, 2020).

- Cultures negatively affects the FP supply chain management performance

2.3.11 Religious Factors

In Ethiopia as well as Addis Ababa there are many factors that impeds the use of contraceptives. For example Christians mention Holy Bibles Old testament part which elucidates that Er, Judah's firstborn, was wicked in the sight of the LORD; and the LORD slew him. And Judah said unto Onan, Go in unto thy brother's wife, and marry her, and raise up seed to thy brother. And Onan knew that the seed should not be his; and it came to pass, when he went in unto his brother's wife, that he spilled [it] on the ground, lest that he should give seed to his brother. And the thing which he did displeased the LORD: wherefore he slew him also. (Genesis 38;7-10)

On the other hand another group of people mention that limiting the number of children is good as it had mentioned in the new testament part of the bible And he brought him to Jerusalem, and set him on a pinnacle of the temple, and said unto him, If thou be the Son of God, cast thyself down from hence: For it is written, He shall give his angels charge over thee, to keep thee: And in [their] hands they shall bear thee up, lest at any time thou dash thy foot against a stone. And Jesus answering said untohim, It is said, Thou shalt not tempt the Lord thy God (luke 4:9-13). This indicates that using the FP logistics are paramount.

- Religions negatively affect the FP supply chain management performance

2.4 Empirical Review

2.4.1 Customer Service

Contraceptive security is a necessity for successful family planning programs and one of the key determinants of contraceptive security is the programmatic capacity in handling the contraceptive logistics system (MOH, 2011).

The national reproductive health strategy of FMOH gives due emphasis to FP. The goal of FP is to reduce unwanted pregnancies and enable individuals to achieve their desired family size. To achieve this the strategy sets the following as action points.

- Delegate to the lowest service delivery level possible the provision of all FP methods
- Increase access to and utilization of quality FP services, particularly for married and unmarried young people and those who have reached desired family size

To achieve the above mentioned aims the sustainable supply chain of FP commodities should be available at service delivery sites (MOH,2011).

The national Integrated Pharmaceutical Logistics System showed that 68% of hospitals and 43% of health centers placed at least one emergency order in the 3 months before the survey (PFSA, 2015) and 75% of health centers had one or more and all hospitals placed more than three times an emergency order of FP items in the past 6 months prior to the study .

In July 2001, a national contraceptive inventory and logistics system survey was conducted by MOH in collaboration with JSI/DELIVER and other partners which showed the absence of a good contraceptive LMIS resulting in expiry of contraceptives worth of more than one million USD and stock out rate in 88.2% of facilities for one or more contraceptives they manage at the time of visit. Actual contraceptive consumption (dispensed to user data) was rarely available in the government sector. Contraceptive issues data from one level to the next was also not generally available. There was no maximum-minimum inventory control system and no established order intervals in place. These situations of stock outs and large quantities of expired contraceptives were found to be due to a poorly functioning logistics system. The survey had also found that there was no standard logistics management information system (LMIS), two thirds of facilities did not use stock cards or did not have accurate data on the stock cards, and logistics data were not often recorded and reported to the higher levels of the system . The results of the study led to the recommendation that a comprehensive LMIS and inventory control system designs be developed for the national family planning program including all forms and reports for the LMIS and inventory control procedures . In 2003, the MOH in collaboration with JSI/DELIVER and other partners designed a contraceptive logistics system mainly focusing on the public sector. The goal of this initiative is to increase availability, quality, and utilization of

family planning services throughout the country. The Ethiopian Contraceptive Logistics System (ECLS) procedures manual was developed and implementation was started in selected five pilot regions (South Wollo Zone in Amhara, Arsi Zone in Oromia, Gedio Zone in SNNPR, Shire Zone in Tigray and the whole of Addis Ababa city administration). Competency-Based Training was provided to all persons responsible in managing contraceptives throughout the supply chain in the public sector in the selected pilot areas of the country. In Addis Ababa City Administration the cascade of training was completed since two years back and implementation of the ECLS is underway in the public health sector for the last two years. But assessment of the contraceptive LMIS was not done until to date in order to identify strengths and weaknesses of the system performance. This assessment will help to identify the strengths and weaknesses of the newly designed logistics system which will further provide recommendations to redesign interventions (Mohammed et. 2006).

2.4.2 Supply Chain Management capacity building

The survey conducted on IPLS implementation in Ethiopia 2014, showed that 87% pharmacy personnel trained on how to order quantities (PFSA, 2015). The study done in East Wollega, Oromia region, indicated that 75.8% of personnel who were managing pharmaceuticals had received IPLS training (Tiye and Gudeta, 2018). The assessment done in Addis Ababa, Ethiopia also indicated that 72.7% and 51.5% of health facilities' staff working on pharmacy units were trained on IPLS and laboratory commodity management (LCM) respectively (Tilahun et al, 2016). A study done by Birhanemeskel in Addis Ababa indicated that 78.9% of store managers in health centers and 75% in hospitals had on job training on IPLS (Berhanemeskelet al., 2016).

2.5 Research Gap

Although there are many studies done in Ethiopia regarding health commodities there is no study done on family planning commodities in Ethiopia as well as Addis Ababa. Therefore the goal of this study has aimed to analyze on factors affecting family planning logistics supply chain in Addis Ababa's selected government Health Centers and Hospitals.

2.6 Conceptual framework of the study

The following figure indicates conceptual frame work of the study.

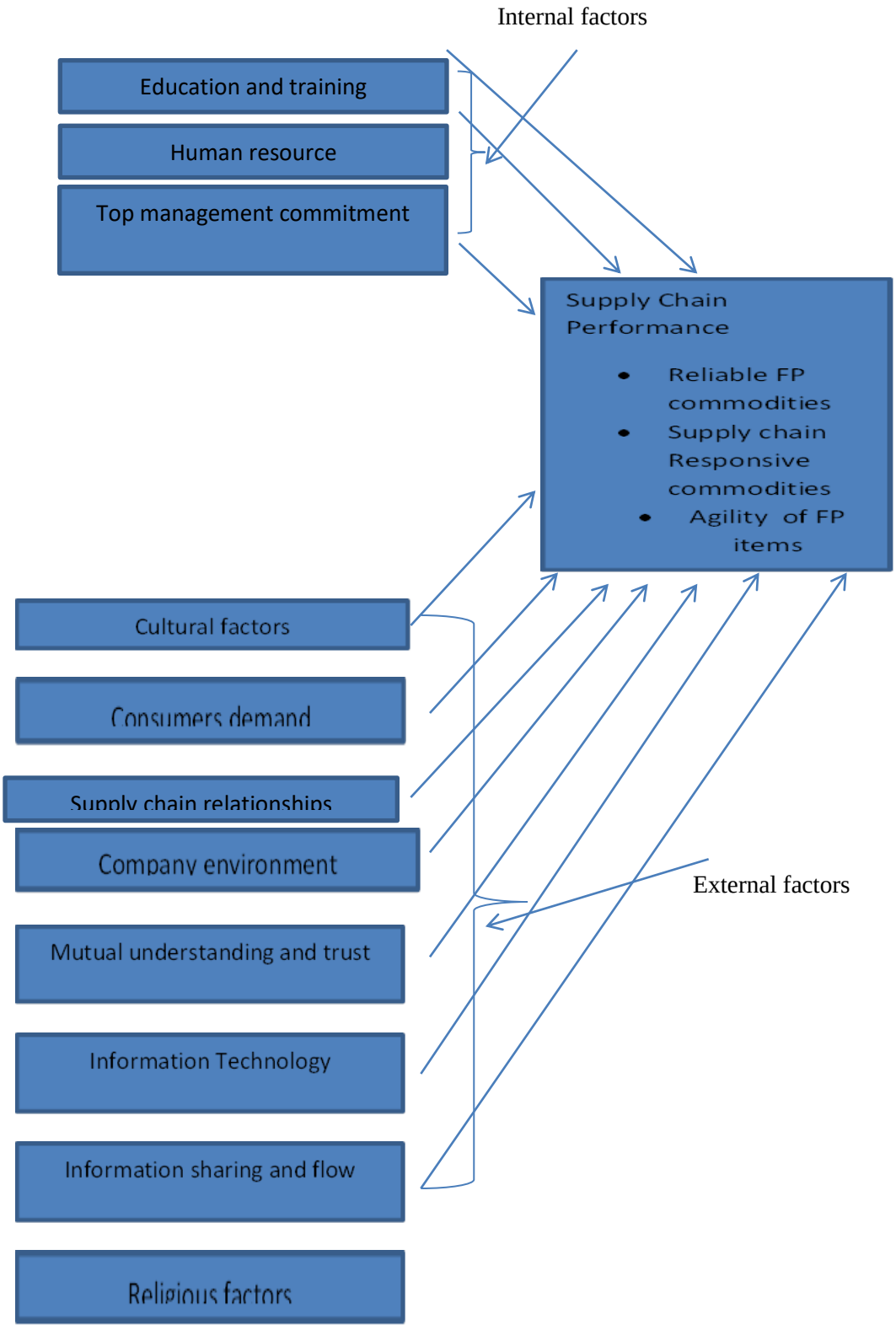


Fig. 3 Conceptual frame work of the study taken from (Oluka, et. 2019)

CHAPTER 3

3. Research Design and Methodology

3.1 Introduction

The study has been conducted in Addis Ababa, the capital city of Ethiopia. It was located at the geographic center of the nation and covers about 540 Km². It is administratively sub-divided into 11 Sub Cities and 116 Weredas. According to the City's Health Bureau, the city has 7 hospitals and 98 Health centers under city administration. All the health facilities of the city administration provide FP service which depend on the demand of their customers (Meseret ,et.al., 2018).

3.2 Research approach

The study had employed both qualitative and quantitative approaches. Quantitative approach had been used to assess the current supply chain management of FP logistics by using quantitative findings, especially the reasons on LMIS data quality, challenges of SCM performance by interviewing important personnel working in the selected health facilities for the study and through observations and deep interview.

3.3. Research design

Health facility based descriptive and explanatory study design had been used for quantitative and qualitative data collection techniques; the required data had been gathered from June 10 - 30, 2022.

3.4. Sampling design

3.4.1. Target Population

The target population for this study have been health centers and hospitals that are under administration of city government of Addis Ababa Health Bureau. As mentioned previously there are 98 health centers and 7 hospitals under Addis Ababa Health Bureau.

3.4.2. Sampling Frame

The sampling frame had been 64 targetted populations (health organizations) that I have participated in my study design.

3.4.3. Sampling technique

Simple random method has aimed to be used as sampling technique.

3.4.4. Sample size

The sample size is the measure of the number of individual samples used in an experiment. Therefore 64 health organizations will be the sample size. So from total of 105 health facilities (Health centers and hospitals) in Addis Ababa the study sample was selected as per the formula below. In this formula 90% confidence level (z), 10% margin of error (e) and 0.5 estimated outcome of the interest or proportion (p) were considered. Hence: $n_o = Z^2 P (1-P)/e^2$ (Meseret ,et.al., 2018).

- n_o is the number of sample to be considered- Z is confidence level corresponds to Z-score

- P is proportion of the sample- e is error margin by inserting the above numbers in the formula, the sample could be: $n_o = (1.645)^2 X 0.5 (1-.5)/0.12 = 68$

By adjusting using finite population correction factor (FPC) formula below:

$n= n_o N / n_o+ (N-1)$, where N is the number of population the sample could be drawn.

n= 68x105/68+104= 64

Therefore, the sample size that has been selected was 64. The selection of these sites was done by systematic simple random selection method by listing the sites in alphabetic order and finding the first facility by lottery method and then the rest according to the following k value.

K= 105/64= 1.6

By approximating K to 2 and starting with the sites which found through lottery, and then selecting the sites after every two list from alphabetically ordered list of Addis Ababa City Administration health bureau facilities (Meseret ,et.al., 2018).

3.4.5. Sampling procedure

A combination of structured questionnaire and observation checklist had used to collect data on receiving, storage, distribution, transfer, bi-monthly report, bin-card, internal facility reports, daily testing registration and an interview guide have been used to seek the reasons.

3.5. Sources of Data

On data sources both primary and secondary sources of data have been used.

3.5.1. Primary source

- Questionnaire

3.5.2. Secondary source

- Bin card
- Model 19 (receiving voucher)
- Model 22 (Issuing Voucher)
- RRFs

3.6. Data Collection methodology

For data collection methodology a combination of questionnaires and observation checklist have used to collect data on transaction of stocks that have undergone in the facilities. Here storage, distribution, receiving, transfer, various reports, bin cards and interviewing techniques have been used.

3.7. Data collection instrument

Both qualitative and quantitative methods have been used.

3.8. Data analysis methods

Collected quantitative data has been categorized and analyzed using descriptive statistics SPSS 23 and excel spread sheet. Figures and tables have been used to present all findings.

3.9. Validity and Reliability test

Validity Test

To check the validity questionnaires and checklists had distributed to two health facilities and they had excluded from the study. Opinion from the professionals was also addressed here.

Reliability Test

The study used Chronbach alpha test to check the reliability of the study. Cronbach's Alpha test is one of the data reliabilities evaluating tests which determined to see how reliable the results, if the sample size expanded, comparable generalized results should be obtained (Field, A., 2006). If the Coefficient alpha ranges value approximate to 0 that indicate no consistency; for complete consistency should be Coefficient alpha ranges value approximate to 1. Hence, speaking, scales with a coefficient α between 0.80 and 0.95 are considered to have very good reliability. Scales with a coefficient α between 0.70 and 0.80 are considered to have good reliability, and a value between 0.60 and 0.70 indicates fair reliability and for poor reliability the coefficient must be below 0.6 scales. Most statistical software packages, such as SPSS, will easily compute this coefficient (Zikmund et al, 2010).

Table 1:- Indicating the reliability statistics

Variables	Reliability	No of Items
Reliability	0.561	4
Responsiveness	0.873	3
Agility	0.728	3
Total	0.720	10

Source: Own Survey and SPSS Output 2023

3.10 Research Ethics

A formal letter that is supporting for this job is obtained from Addis Ababa Health Bureau supported by full willing of professionals that I have interviewed. Here the purpose of the interview was clearly told to the professionals, especially the issue of confidentiality *i.e.* it had told to each interviwee that their name and address is not going to be exposed to any one else. Because of this all professionals were volunteer to donate every information I need from them.

CHAPTER 4

4. Interpretation, Results and Discussion

A total of 64 health facilities (57 health centers and 7 hospitals) had been assessed. The assessment had showed that 95% of pharmacy head were degree holders while the rest of them were diploma holders. In addition 64% of store managers were diploma holders while the rest of them had bachelor of degree in pharmacy. All health facilities (100%) provide FP services within their set up.

4.1 Supply chain practices at FP unit with focal person

The experience of the participants who were giving and counseling FP services 21% were between 1-3 years and 53.5% were between 4-7 years and 23.5% were between 8-10 years and the rest of them was above 10 years (2%). The items like mini pills, IUCD, COC, Jadelle and Depo Provera had been given in all facilities. The health facilities provide FP services for all volunteers and the services had been given at FP room. All services had been given in the health organizations but some facilities have shortages in some items of pharmaceuticals. Accordingly 5% health facilities had shortage of Inplanon, 9% Depo and 17.3% had shortage of COC. The other programs had no shortage.

The city had planned to host 51,000 FP clients and had achieved giving services for about 44,178 clients. This indicates 86.6% of achievements.

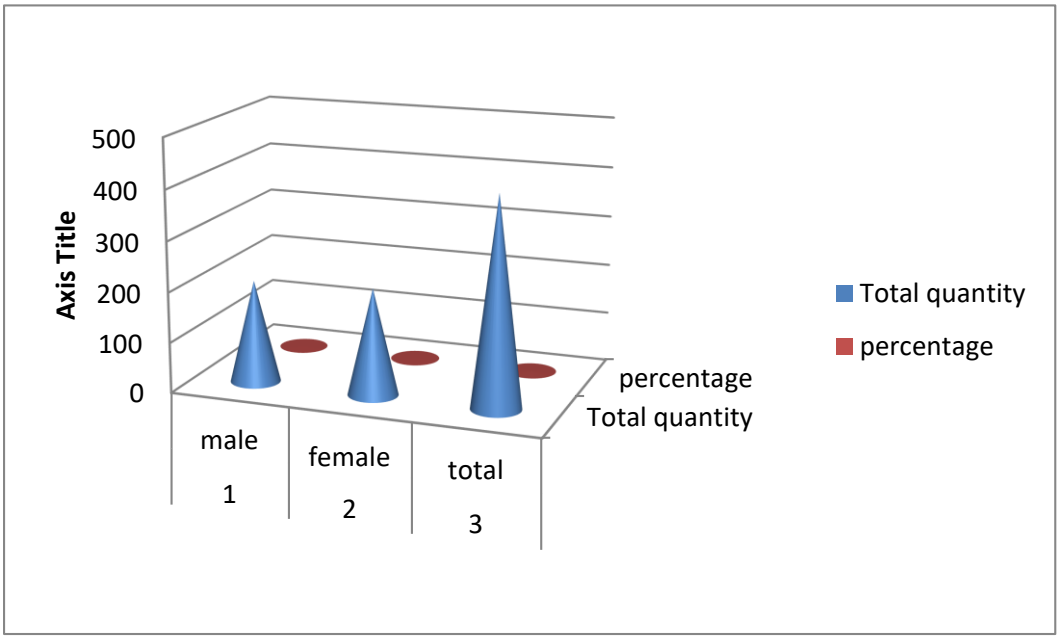
Table 2:- plan vs achievement of Family Planning

SN	lists	Qty	Percentage(%)
1	plan	51,000	100
2	achievements	44,178	86.6
3	Total	95,178	93.3

4.2 Supportive supervision practices and workforce at the pharmacy unit

There are about 651 pharmacy professionals working in the contacted health facilities in total of which 51% of pharmacy professionals were females while whereas 49% were males. The assessment had showed that 95% of pharmacy heads were degree holders while the rest of them were diploma holders. On the other hand 64% of store managers were diploma holders while the rest of them had bachelor of degree in pharmacy.

Fig. 4 Male and Female amount in percentage of pharmacy professionals

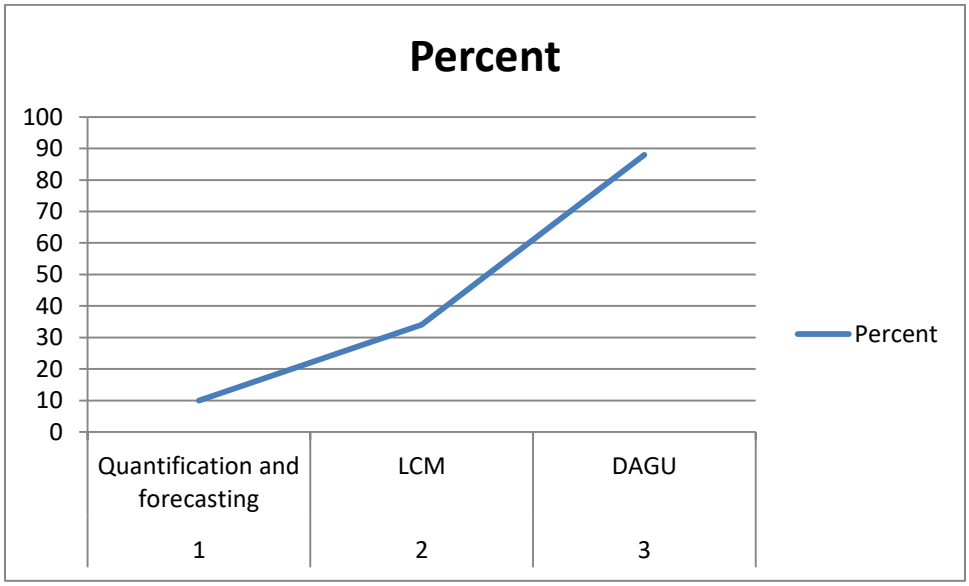


Source (own survey data)

Professionals had SCM related training like IPLS and DAGU (88% of them),LCM(34%), quantification and forecasting (10%).

All facilities had received supportive supervision (100%) in the last 6 months. facilities had received their SS from AACAHB, sub city and other partners. As it is obvious supportive supervision helps in SCM of FP pharmaceuticals even though many health facilities had stockout of some pharmaceuticals due to the problem of suppliers.

Fig. 5 Indicates the type and percent of training



source:- own survey 2023

4.3 Logistics management information system (LMIS) practices

LMIS collects, organizes and reports logistics data for decision-making. Ethiopia has a well designed LMIS used for program commodities, including HIV and AIDS, family planning, TB & Leprosy and malaria. With the introduction of IPLS, various recording and reporting formats were designed for use at different levels of the healthcare supply chain. Availability and usage of standard forms and tools are critical supply chain indicators. At the facility level, bin cards, Internal Facility Report and Resupply Form (IFRR), Health Post Monthly Report and Resupply Form (HPMRR) and Report and Requisition Form (RRF) were introduced to record commodity transactions and report quantities for resupply (Meseret, 2018).

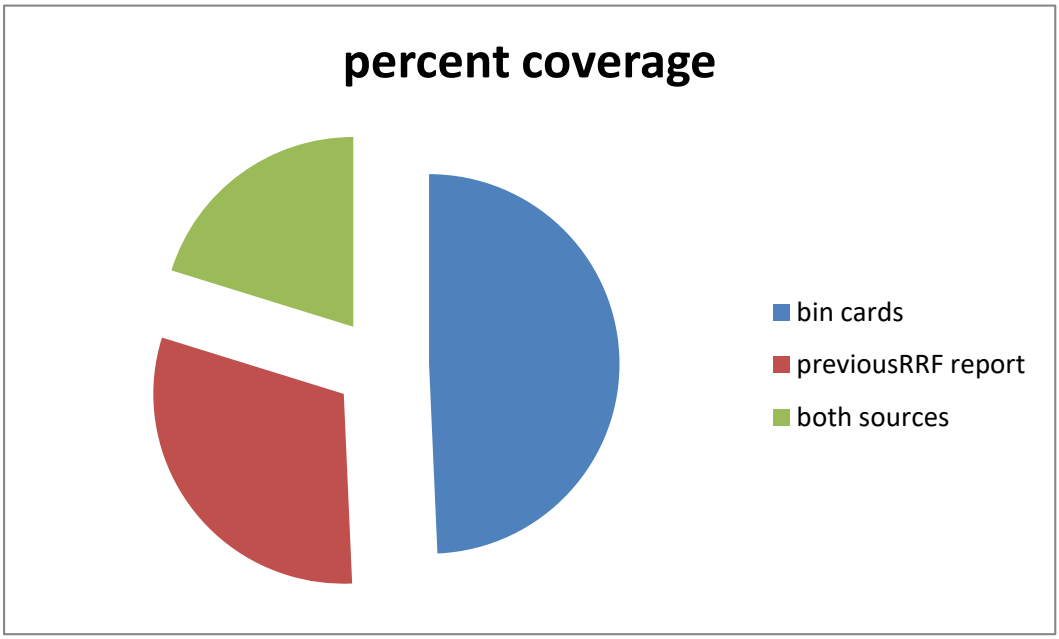
According to IPLS all FP pharmaceuticals are supplied by EPSA 1 and EPSA 2. They all use RRF for their reporting and requesting. On the RRF SOH, quantity received, consumption data and losses and adjustments were reported. With regard to reporting and ordering store manager is responsible for the health centers and drug supply manager will be in a position to report and

request pharmaceutical logistics for the hospitals every other months (2 months). HFs use DAGU -2 and bin cards for their reports (own surveys).

4.4 Distribution and Transportation Practices At The Pharmacy Unit

All 64 (100%) health facilities receive their pharmaceuticals from EPSA(1&2) bi-monthly and for all of them EPSA sends their requests by its own vehicle if no special problem is created. All health facilities use RRF for their pharmaceutical demand. HFs DUs report datas like beginning balance, quantity received, losses and adjustments as well as ending balance. 49.3% health facilities use bin card, 30.5% used the previous report and 20.2% of the facilities had used both the previous report and bin cards for their report as data sources.

Fig. 6 Indicates the source of information while requesting FP commodities



Source; own survey 2023

4.5 Operational Performance of FP Commodities SCM

On Reliability Statements

With respect to providing the right quantity of FP pharmaceuticals for DUs as per their request 33.2% of the facilities respondents said that they agree, 40.7% were neutral, 22% answered that they strongly agree 1% of them were strongly disagree and 3.1% were disagreed.

It can be seen that HFs were at good level of providing the right quantity of FP for their DUs.

On providing the FP pharmaceuticals with correct packaging for DUs 71.6% had strongly agreed, 17.7% had agreed, 9% were neutral and 1.7% were disagreed while 0% strongly disagreed.

HFs has no problems on providing FP pharmaceuticals with correct packaging.

On providing FP pharmaceuticals with high quality 73.9% had strongly agreed, 14.4% agreed, 4.3% neutral, 7% disagreed and 0.4% were strongly disagreed.

HFs has also no problem on providing high quality pharmaceuticals to their respective DUs.

All respondents had strongly agreed (100%) that they give vouchers by completing information before they issue pharmaceuticals for DUs.

All in all HFs supply vouchers by completing the right information to their suppliers.

Responsiveness Statements

51.4% of the facilities had strongly agreed, 25% agreed, 5.9% were neutral , 12% were disagreed and 5.7% were strongly disagreed on dispensing FP pharmaceuticals per their schedule.

The data indicates that there is a situation in which FP pharmaceuticals are dispensed to their DUs per their schedule.

15.6% were strongly disagreed, 10.1% disagreed, 25.4% were neutral, 30.8% were agreed and 18.1% were strongly agreed on that they provide FP pharmaceuticals on time after their requisition.

Most of the HFs had agreed that they provide FP pharmaceuticals on time after their requisition.

5.3% were strongly disagreed,17.6% were disagreed, 29.5% were neutral, 30% were agreed and 17.6% were strongly agreed on issuing FP items requested.

Most of the HFs had agreed that they issue FP pharmaceuticals requested.

Agility

17.8% were strongly disagreed, 12.5% were disagreed, 20.6% were neutral, 36.1% were agreed and 13% were strongly agreed on adapting quickly to a system of stock managing when there were stock out.

4.5% were strongly disagreed, 20.2% were disagreed, 14.1% were neutral, 30.6% were agreed and 30.6% were strongly agreed on adapting quickly to a system of stock managing when new FP pharmaceuticals were arrived.

It can be concluded that in most of HFs that there were a system of stock managing when new FP pharmaceuticals were arrived.

7.2% were strongly disagreed, 5.3% disagreed, 28.7% were neutral, 30.1% were agreed and 28.7% were strongly agreed on monitoring the overall FP pharmaceutical value at risk.

So the value indicates that most of the interviewed pharmacists will consider the issue of monitoring the overall FP pharmaceuticals value at risk.

4.6 Major Challenges of FP Pharmaceuticals SCM Practices

Company Environment

3.3% were strongly disagreed, 15.3% were disagreed, 20.6% were neutral, 30.5% were agreed and 30.3% were strongly agreed on making suitable storage area to maintain the quality of FP pharmaceuticals. This indicates that in most of the facilities working environment was suitable to maintain the quality of FP pharmaceuticals.

30.6% were strongly disagreed, 25.7% disagreed, 10.1% were neutral, 17.1% were agreed and 16.5% were strongly agreed on that the storage area has dispatch unit to provide delivery of FP pharmaceuticals to DUs. It can be seen from this result that most of HFs had no dispatch area that makes professionals working in that area to be burned out.

11.1% had strongly disagreed, 16.5% were disagreed, 22.7% were neutral, 27.1% were agreed and 22.6% were strongly agreed on the suitability of storage areas to monitor the overall FP pharmaceuticals value at risk.

But in some health facilities the working environment was not conducive as the store room of pharmaceuticals were not on the ground. Because of this Pharmacy professionals will suffer from unnecessary expenditure when they are in position to move pharmaceuticals from the store room to the place where they are dispensing to the clients.

Top Management Commitment

9.2% strongly disagreed, 11.3% disagreed, 19.9% were neutral, 26.1% were agreed and 33.5% were strongly agreed on the assistance of top management of the supply chain unit in a way that the quality of FP pharmaceuticals is maintained.

According to this survey the top management has had a good commitment to help professionals in maintaining the quality of FP pharmaceuticals that they takeover.

13.3% were strongly disagreed, 27.2% were disagreed, 24.1% were neutral, 30.5% were agreed and 4.9% were strongly agreed on monitoring the issuing of FP pharmacueticals for DUs per their schedule.

It can be seen that top management has had good commitment in monitoring the issuing FP pharmaceuticals by DUs so that they will not request their pharmaceuticals out of their schedule. But in some health organizations there was a problem in this area.

15.7% were strongly disagreed, 2.2% were disagreed, 15.1% were neutral, 30.9% were agreed and 36.1% were strongly agreed on the following the supply chain unit adapting quickly to a system of stock managing when new FP pharmaceuticals had arrived.

Most of the health organizations had no problem in utilizing new arrivals when it has had arrived at their set up.

During my assessments I have been able to see that most of the top managements have marvelous commitment to help professionals so that they will make SCM of FP commodities not interrupted.

Mutual Understanding and Trust

11.5% had strongly disagreed, 20.9% had disagreed, 5.3% were neutral, 13.6% were agreed and 48.7% were strongly agreed on whether their facilities had mutual understanding and trust with the supplier in availing FP pharmaceuticals which has high quality.

Most of the HFs had showed that they had a good mutual understanding and trust with their sole supplier which is EPSA.

11.4% strongly disagreed, 19.1% disagreed, 25.1% were neutral, 30.3% were agreed and 14.1% were strongly agreed whether EPSA delivers FP pharmaceuticals to their facilities as per their RRF.

In most of the cases EPSA supplies the FP pharmaceuticals according to their demand. But in some cases it will not supply them according to their demand.

5% strongly disagreed, 3.1% disagreed, 30.1% were neutral, 29.4% were agreed and 32.4% were strongly agreed whether the supply chain unit adapt quickly to a system of stock managing when there were FP pharmaceuticals stock out.

Information Sharing And Flow

All health facilities strongly agreed (100%) that they give vouchers(model 19) to EPSA personnels by completing the required information.

As it has legal consequence no individual will not permit you take his pharmaceuticals unless and otherwise you give him model 19.

1.4% had strongly disagreed, 9.3% disagreed, 7.7% were neutral, 32.5% were agreed and 49.1% were strongly agreed that information sharing with EPSA enables the on time delivery of FP pharmaceuticals.

It is clear as no one will not earn his pharmaceuticals with out timely giving information and reports.

3.4% strongly disagreed, 10.1% disagreed, 14.7% were neutral, 39.4% were agreed and 32.4% were strongly agreed on the fact that the right information sharing and flow helps to adapt quickly to a system of stock managing when there is FP pharmaceuticals stock out.

As it is quite obvious no one will earn his products with out reporting his stock out as well as stock on hand.

Consumers Demand

2.3% strongly disagreed, 7.3% disagreed, 2.9% were neutral, 40.2 were agreed and 47.3% were strongly agreed on whether the facilities providing high quality FP pharmaceuticals as per the consumers demand.

It can be pretty seen that all most all of the HFs had been providing high quality FP pharmaceuticals as per customers demand.

5.3% strongly disagreed, 9.1% disagreed, 18.6% neutral, 50.1% agreed and 16.9% were strongly agreed on whether facility provides FP pharmaceuticals on time as per the consumers demand.

All HFs provide FP pharmaceuticals as soon as their customer had demanded them.

3.8% strongly disagreed, 11.9% disagreed,6.4% neutral, 25.8% were agreed and 52.1% were strongly agreed on whether the facility tries to adapt quickly to a system of stock managing when there is stock out to fulfill consumers demand.

Information Technology

6.8% strongly disagree, 3.5% disagree, 11.4% neutral, 40.1% agree and 38.2% strongly agree on whether the facility has automated system to supply the right amount of FP pharmaceuticals for DUs as per their request.

In actual scenario all HFs have had an automated system called DAGU which enables them record their transaction system so that they will issue the right amount of pharmaceuticals for DUs per their request.

6.8% strongly disagree, 3.5% disagree, 11.4% neutral, 40.1% agree and 38.2% strongly agree on whether the facility has automated system to manage the on time supply of FP pharmaceuticals for DUs as per their request.

The DAGU also helps here so that they can issue the right amount of pharmaceuticals for DUs on time per their request.

6.8% strongly disagree, 3.5% disagree, 11.4% neutral, 40.1% agree and 38.2% strongly agree on whether the facility has automated system that helps the facility to monitor FP pharmaceuticals the value at risk.

Supply Chain Relationships

3.7% strongly disagree, 11.6% disagree, 19.6% neutral, 29.8% agree and 35.3% were strongly agree that the facility has good supply chain relationships with EPSA so as to supply the right amount of FP pharmaceuticals as per their request.

It can be seen that HFs have had good supply chain relationships with EPSA so that they will get supplied the right amount of pharmaceuticals per their request.

11.9% strongly disagree, 8.2% disagree, 17.3% were neutral, 29.6 % were agreed and 33% were strongly agreed on whether the facility has strong supply chain relationships with EPSA to manage the on time supply of FP pharmaceuticals.

Again it can be concluded that health organizations have strong supply chain relationships with EPSA so that they will be endowed on time the pharmaceuticals they need or demand.

3.4% strongly disagreed, 10.0% disagreed, 6.7% were neutral, 25.3% were agreed and 54.6% were strongly agreed on whether the facilities has strong supply chain relation with EPSA to adapt quickly to a system of stock managing when there is stock out.

The facilities had strong supply chain relationships with EPSA so that they can adapt quickly to a system of stock managing when there were stock out.

Human Resources

0.2% strongly disagreed, 1.3% disagreed, and 10.8% were neutral, 45.7% were agreed and 42.1% strongly agreed on whether the facility has enough supply chain experts to supply the right amount of FP pharmaceuticals as per their request.

Most of the contacted professionals had enormously explained that they have enough supply chain experts so that they can be supplied the right amount of FP pharmaceuticals as per their request.

0.2% strongly disagreed, 1.3% disagreed, and 10.8% were neutral, 45.7% were agreed and 42.1% strongly agreed on whether the facility has enough supply chain experts to manage the on time supply of FP pharmaceuticals.

All HFs had explained that they have sufficient amount of supply chain experts so that they can manage the on time supply of FP pharmaceuticals.

0.2% strongly disagreed, 1.3% disagreed, and 10.8% were neutral, 45.7% were agreed and 42.1% strongly agreed on whether the facility has enough supply chain experts to adapt quickly to a system of stock managing when there is stock out.

Education and Training

20.1% strongly disagreed, 25.2% disagreed, 30.7% were neutral, 16.2% were agreed and 7.8% were strongly agreed on whether the facility has placed a system to provide SCM related capacity building so as to supply the right amount of FP as per their request.

The survey indicates that there is a gap on SCM related capacity building so that the right amount of FP pharmaceuticals will be demanded per their request.

15.2% were strongly disagreed, 10.7% were disagreed, 28.6% were neutral, 30.5% were agreed and 15% were strongly agreed on whether the supply chain experts are trained to manage the on time supply of FP pharmaceuticals to the DUs.

It can be said that it is sufficient that the supply chain experts were in a position to manage the on time supply of FP pharmaceuticals to the DUs.

15.2% were strongly disagreed, 10.7% were disagreed, 28.6% were neutral, 30.5% were agreed and 15% were strongly agreed on whether the supply chain experts has the skill and knowledge on how to adapt and manage the FP pharmaceuticals stock when there is stock out.

It can be deduced that the SCM experts had the skill and knowledge on how to adapt and manage the FP pharmaceuticals stock when there is stock out.

Religious Factors and Cultural Factors

14.3% strongly disagreed, 30.1% disagreed, 25.6 were neutral, 26.7% agreed and 3.3% were strongly agreed on the notion that clients coming to their clinic complain using the contraceptive due to their religion.

It can be seen that most of the clients coming the FP unit will not complain on using the contraceptive due their religion.

21.2% strongly disagreed, 5.2% disagreed, 30.1% were neutral, 16.4% agreed and 27.1% were strongly agreed so that clients coming to their clinic say some thing about their culture so that it hinders the usage of the FP programs.

Most of the clients have no concern on their culture so that it will not hinder them from using FP programs.

Correlation between FP commodities supply chain performance and factors affecting the

FP commodities supply chain performance

The Pearson correlation coefficient (r) is the most widely used correlation coefficient and is known by the following names:

- Pearson's r
- Bivariate correlation
- Pearson product-moment correlation coefficient (PPMCC)

In order to analyze the correlation between FP commodities supply chain performance and factors

affecting the FP commodities supply chain performance a bivariate correlation was used.

Table 3:- Pearson correlation and factors affecting FP commodities SCM

SN	FASCMP →	HRM	ET	TMC	CE	ISF	MU	IT	SCR	CD	CF	RF
1	Pearson correlation	0.020	0.043	0.873	0.367	0.574	0.004	0.003	0.067	0.078	0.830	0.371
	Sig. 2 tailed	0.015	0.001	0.054	0.013	0.012	0.031	0.164	0.001	0.043	0.123	0.910

Source own survey, 2023

FASCMP= Factors affecting supply chain management and performance

HRM= Human resource management IT= Information technology

ET= Education and training SCR= Supply chain relationships

TMC= Top management commitment CD= consumers demand

CE= Company environment CF= Cultural factors

ISF= Information sharing and flow RF= Religious factors

MU= Mutual understanding and trust

Human Resource positively and significantly affects the FP commodities supply chain management performance

Spearman's Correlation shows there is a statistical significance showing positive correlation between FP Commodities SCM performance and Human Resources of the health facility

(N=64, sig (2-tailed) =0.015, P<0.05); Therefore, accepted!

This can be correlated with 5 scale likerts scale that most of the professionals have elaborated that the availability of trained human resource has the significant effect on SCM of FP Commodities SCM.

Education and Training positively affects FP commodities Supply Chain Management Performance

20.1% strongly disagreed, 25.2% disagreed, 30.7% were neutral, 16.2% were agreed and 7.8% were strongly agreed on whether the facility has placed a system to provide SCM related capacity building so as to supply the right amount of FP as per their request. This idea from the respondents complies with Spearman's Correlation that shows there is a statistical significance showing positive correlation between FP Commodities SCM performance and Education and training.

(N=64, sig (2-tailed) =0.001, P<0.05); Therefore, accepted!

Top management commitment positively affects the FP commodities supply chain management performance.

Spearman's Correlation shows there is a statistical significance showing negative correlation between FP Commodities SCM performance and top management commitment.

(N=64, sig (2-tailed) =0.054, P>0.05); Therefore, rejected!

This complies with that 33.5% were strongly agreed on the assistance of top management of the supply chain unit in a way that the quality of FP pharmaceuticals is maintained.

Environmental uncertainties negatively and significantly affects the FP commodities supply chain management performance.

3.3% were strongly disagreed, 15.3% were disagreed, 20.6% were neutral, 30.5% were agreed and 30.3% were strongly agreed on making suitable storage area to maintain the quality of FP pharmaceuticals. This indicates that in most of the facilities working environment was suitable to maintain the quality of FP pharmaceuticals.

30.6% were strongly disagreed, 25.7% disagreed, 10.1% were neutral, 17.1% were agreed and 16.5% were strongly agreed on that the storage area has dispatch unit to provide delivery of FP pharmaceuticals to DUs. It can be seen from this result that most of HFs had no dispatch area that makes professionals working in that area to be burned out.

11.1% had strongly disagreed, 16.5% were disagreed, 22.7% were neutral, 27.1% were agreed and 22.6% were strongly agreed on the suitability of storage areas to monitor the overall FP pharmaceuticals value at risk.

Spearman's Correlation shows that there is a statistical significance showing positive correlation between FP Commodities SCM performance and company environment.

(N=64, sig (2-tailed) =0.013, P<0.05); Therefore, accepted!

Information Sharing and Flow positively affects supply chain management performance

Spearman's Correlation shows that there is a statistical significance showing positive correlation between FP Commodities SCM performance and Information sharing and flow.

(N=64, sig (2-tailed) =0.012, P<0.05); Therefore, accepted!

Mutual understanding and Trust positively affects supply chain management performance

Spearman's Correlation shows that there is a statistical significance showing positive correlation between FP Commodities SCM performance and mutual understanding and trust.

(N=64, sig (2-tailed) =0.031, P<0.05); Therefore, accepted!

Information Technology positively affects supply chain management performance

Spearman's Correlation shows that there is a statistical significance showing positive correlation between FP Commodities SCM performance and mutual understanding and trust.

(N=64, sig (2-tailed) =0.164, P>0.05); Therefore, rejected.

Supply Chain Relationship positively affects supply chain management performance

Spearman's Correlation shows that there is a statistical significance showing positive correlation between FP Commodities SCM performance and mutual understanding and trust.

(N=64, sig (2-tailed) =0.001, P<0.05); Therefore, accepted.

This complies with the conclusion from the likerts scale that health organizations have strong supply chain relationships with EPSA so that they will be endowed on time the pharmaceuticals they need or demand.

Consumers demand positively affects the FP supply chain management performance

Spearman's Correlation shows that there is a statistical significance showing positive correlation between FP Commodities SCM performance and consumers demand.

(N=64, sig (2-tailed) =0.043, P<0.05); Therefore, accepted.

Likerts scale indicates that 2.3% strongly disagreed, 7.3% disagreed, 2.9% were neutral, 40.2 were agreed and 47.3% were strongly agreed on whether the facilities providing high quality FP pharmaceuticals as per the consumers demand. This indicates that both ideas are synergistic to each other.

Cultures negatively affect the FP Commodities supply chain management performance

Spearman's Correlation shows that there is a statistical significance showing negative correlation between FP Commodities SCM performance and cultures.

(N=64, sig (2-tailed) =0.123, P>0.05); Therefore, rejected.

This will comply with the idea that most of the clients coming the FP unit will not complain on using the contraceptive due their culture.

Religions negatively affect the FP Commodities supply chain management performance

Spearman's Correlation shows that there is a statistical significance showing negative correlation between FP Commodities SCM performance and religions.

(N=64, sig (2-tailed) =0.910, P>0.05); Therefore, rejected.

This will comply with the idea that most of the clients coming the FP unit will not complain on using the contraceptive due their religion.

Challenges mentioned by pharmacy professionals and EPSA on FP commodities SCM

In some of the health facilities professionals had mentioned that family planning focal will not request their commodities according to the set program. Because of this they have mentioned that they are being bothered to know the right amount of commodities they are going to request for 2 months(minimum standard set according to the IPLS). So may ask below the required amount and above the required amount. This in turn affects the overall supply chain activity of

the city as well as the country. Additionally the have also mentioned that EPSA will some time delay to deliver some products later than they have requested. But on the side of EPSA they have elaborated that they have a problem of hard currencies so that they will not procure the required pharmaceuticals on time. On contrary to this some of the professionals in the health facilities are nonchalant regarding the demand of FP commodities demand and supply. This incurs EPSA not to avail the right amount of the pharmaceuticals they will supply for the health organizations. So professionals should be able to demand the right amount of their commodities on time. Additionaly EPSA has elucidated that there are HFs that will not quantify the right quantities of the FP commodities so that they integrate and quantify the nationwide quantities of the commodities.

4.7 storage conditions

Storage ensures the physical integrity and safety of products and their packaging, throughout the various storage facilities, until they are dispensed to clients. An important goal in storage of health products is the correct staging of health products to ensure that orders can be filled and distributed Storing products below standard storage condition will affect the shelf life of the product, leads to damage, expiry and different types of wastage. Storage condition of the facilities were assessed using modified USAID/DELIVER Project storage assessment tool to explore facilities that maintained minimum storage condition. The surveyed criteria was listed as follows (PFSA, 2017).

Table 4:- indicates the status storage guide lines

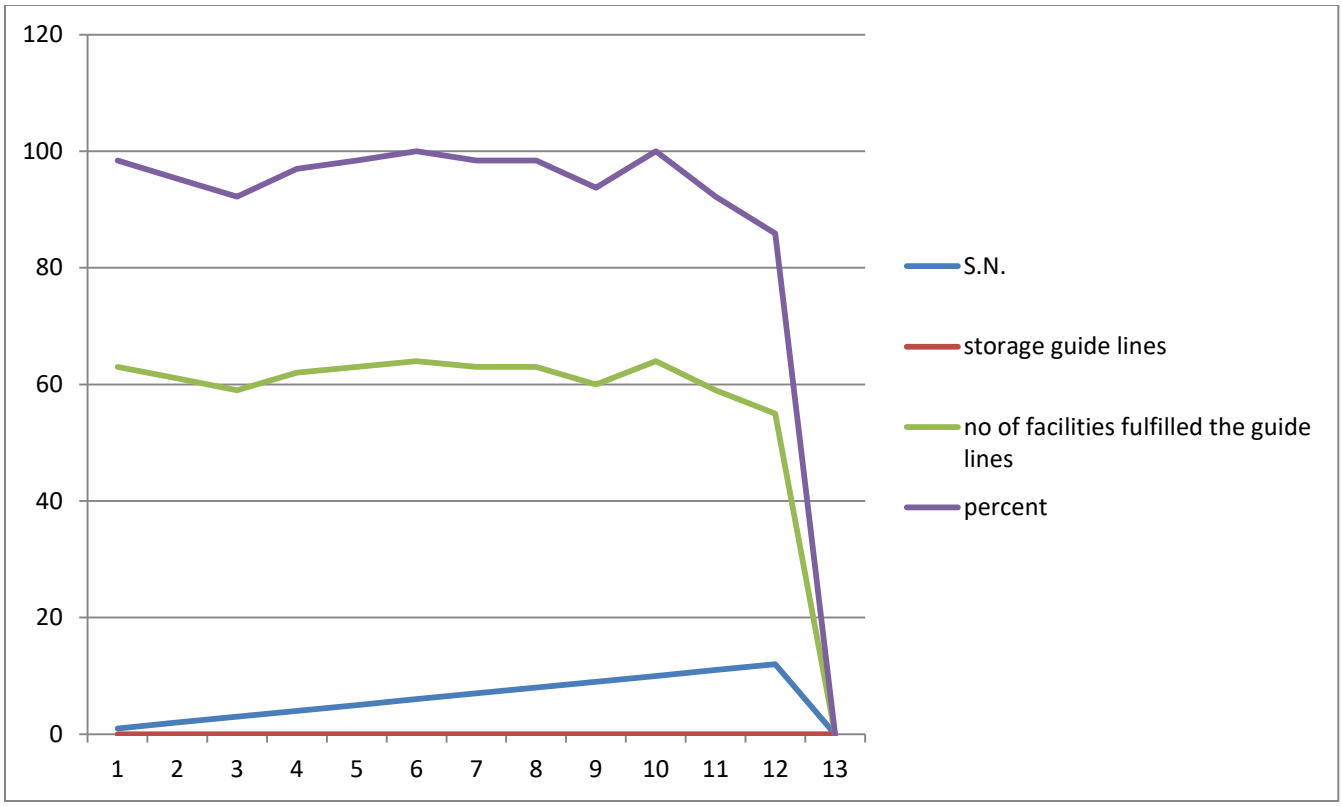
S.N.	Storage guide lines	no of facilities fulfilled the guide lines	Percent(%)
1	Pharmaceuticals are placed systematically (therapeutically, alphabetically)	63	98.4
2	Pharmaceuticals are placed so that labellings are visible.	61	95.3
3	Pharmaceuticals are stored and organized in a manner accessible for first expire first out (FEFO).	59	92.2

4	Cartons and products are in good condition, not crushed due to mishandling. if cartons were open, determine if products are wet or cracked .	62	97
5	Expired products are separated from usable products and removed from shelf	63	98.4
6	Products are protected from direct sunlight.	64	100
7	Cartons and products are protected from water during all seasons.	63	98.4
8	Storage area is always free from harmful insects and rodents.	63	98.4
9	Security devices (grills for windows doors made of glass, and lock and key) are in place	60	93.75
10	Products that need cold temperature are stored in a functional refrigerator	64	100
11	Store room was maintained in a good condition (clean, all trash removed,strong shelves, organized boxes)	59	92.2
12	The current space and organization was sufficient for existing products and reasonable expansion	55	85.9

Source:- own survey

To elaborate the former mentioned storage guide lines in figure, it have depicted or portrayed as follows

Fig 7. Indicates the storage guide lines implementation status in pictorial form



source is own survey data 2023

From the figure it can be seen that 55 health facilities had fullfilled the criterion of fulfilling storage guideline that mentions that the current space and organization was sufficient for existing products and reasonable expansion which was about 86%. This indicator was the least achieved from the assessed HFs. Another criteria evaluated was whether the store room was maintained in a good condition (clean, all trash removed, strong shelves, organized boxes). This was the second least achieved by only 59 HFs. The most achieved guideline were 2. It was about measuring whether the sunshine directly accesses the pharmaceuticals and storing products the requires cold temperatures accordingly. So all 64 health organizations had fulfilled these criterion indicating 100% achievements. The others were damaged and\ or expired products are separated from usable products and removed from shelf, cartons and products are protected from water during all seasons, products are arranged systematically (pharmacologically, alphabetically) and storage area is always free from harmful insects and rodents. These four guidelines were achieved by 63 facilities which was about 98.4%.

4.8 Availability and updating of Bin cards

Bin card is an individual stock keeping record that holds information about a single product by lot number or batch number. So, bin Card per product is one of important activity in inventory management. Therefore, its consistent and accurate use is essential for facilities inventory management (Meseret, 2018).

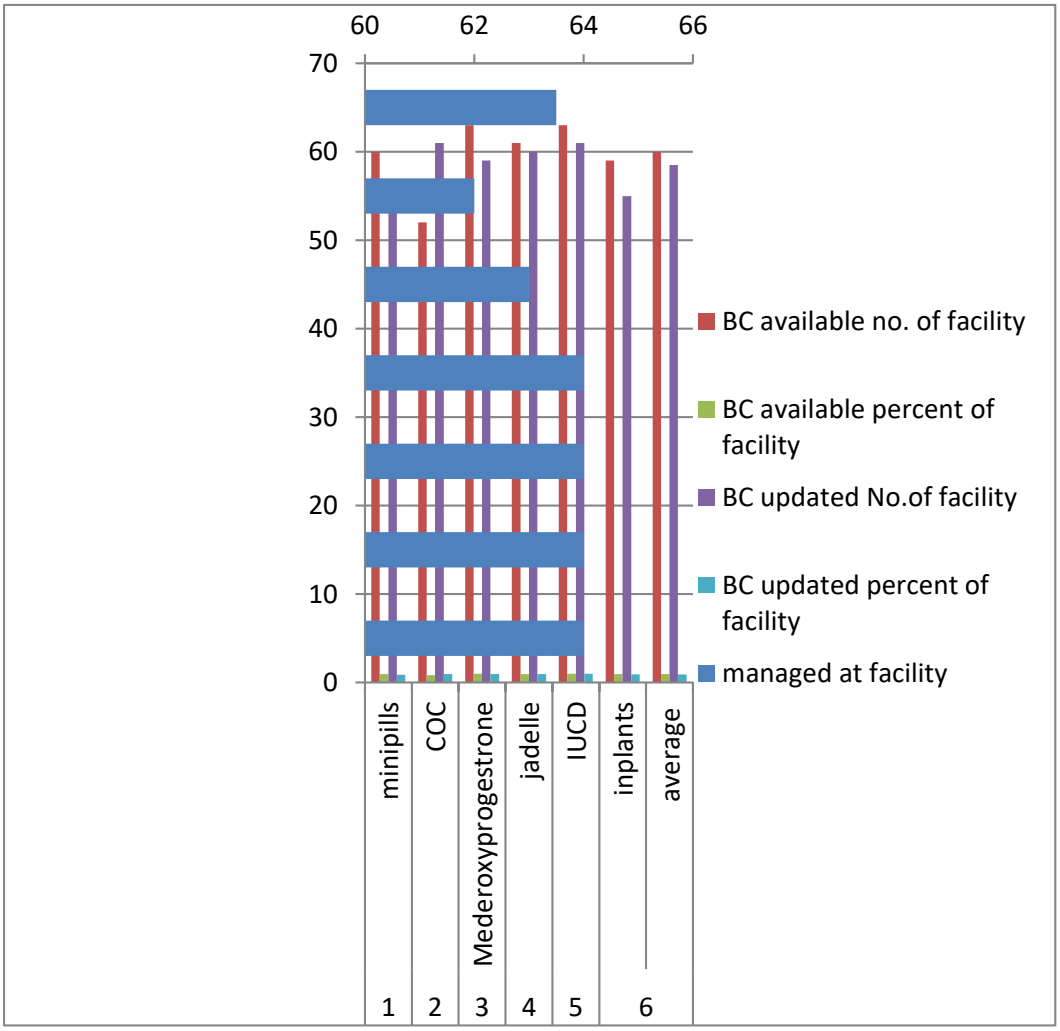
Concerning updating of bin cards, facilities were expected to update their bin card whenever there is flow of FP Pharmaceuticals from or to store room. Updating bin cards were used to assess the quality of data by cross-checking the accuracy of the bin card balance with the physical count for each of the FP pharmaceuticals on the day of the visit. A bin card with no discrepancy between the bin card and the physical count is considered accurate. Hence, during assessment balance left in bin card versus physical count were checked for updating bin cards.

Table 5. Bin card usage status

SN	Name of products	managed at facility	BC available		BC updated	
			no. of facility	percent of facility	No.of facility	percent of facility
1	Minipills	64	60	93.80%	55	85.90%
2	COC	64	61	95.30%	52	81.30%
3	Mederoxyprogestrone	64	63	98.40%	59	92.20%
4	Jadelle	64	61	95.30%	60	93.80%
5	IUCD	63	63	100%	61	96.80%
6	Inplants	62	59	95.20%	55	88.70%
	average	63.5	60	94%	58.5	92.10%

Source :-own survey data 2023

Fig.8 below:- Manifesting Bin card utilization status

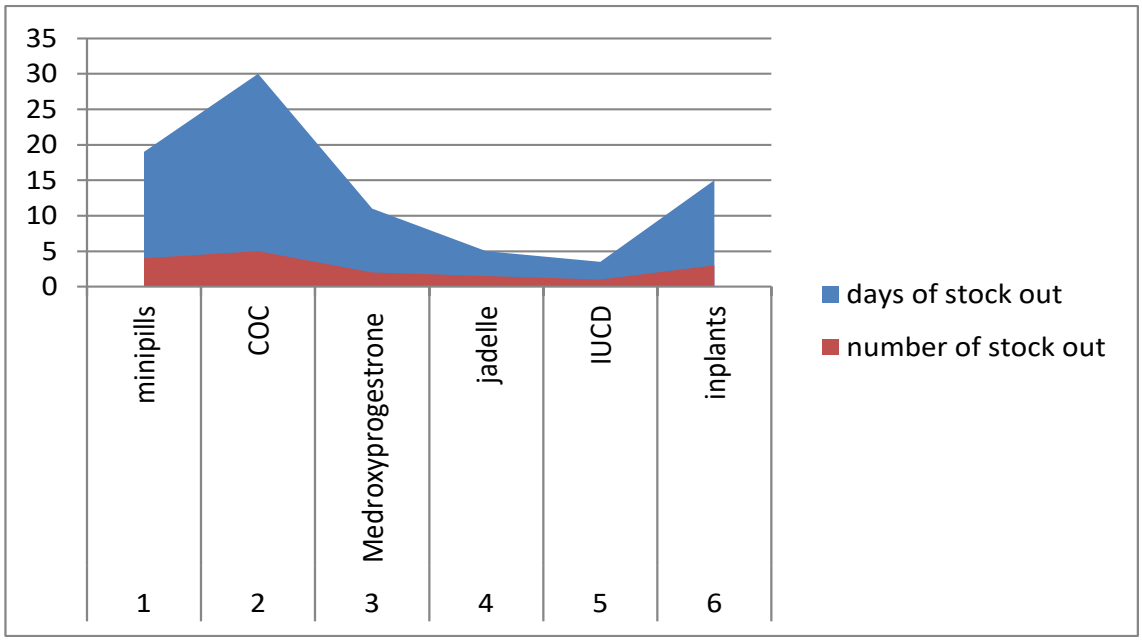


source:- own survey 2023

4.9 Days of stock out and frequency of stock outs in 12 months.

Days of stock out is the number of days in which the FP pharmaceuticals were not available whithin the assessed health premises or facilities while number of stock out was the frequencies of non-availability of health logistics whithin the set of assessed health organization.

Fig. 9:-Indicates days of stock out and number of stock out



Source:- own survey 2023

To help maintain adequate stock levels, the maximum months of stock, minimum months of stock and an emergency order point have been established for each health facility in the system. The maximum months of stock is the largest amount of each pharmaceutical a facility should hold at any one time.

If a facility has more than the maximum, it is overstocked and risks having stocks expire before they are used.

- The minimum months of stock is the level of stock at which actions to replenish inventory should occur under normal conditions.

- The emergency order point is the level where the risk of stocking out is likely, and an emergency order should be placed immediately.

The inventory control system for the IPLS is a Forced Ordering Maximum/Minimum inventory control system. This means that all facilities are required to report on a fixed schedule (monthly at health posts, every other month at health centers and hospitals) for all products. In addition, all

products are re-supplied each time a report is completed. In emergencies, an emergency order can be placed (PFSA, 2017).

According to my survey done the highest days of stock out and frequencies of stock out were seen at Minipills and COC which have the highest turnover then other FP pharmaceuticals. This arises from the fact that both products usage was for the shorter period of time which respect to the other FP pharmaceuticals. On the contrary pharmaceuticals like IUCD and Inplants have had shorter DOS and frequencies out of stock.

Level	Review Period	Maximum Months of Stock	Minimum Months of Stock
Health centers and Hospitals	Every other month	4 months	2 months
Health Posts	Monthly	2 months	1 months

According to the survey COC had the average DOS of about 30 days and Minipills had about 19 DOS in average.

Table 6:- Indicates minimum and maximum months of stock per IPLS standard (Source:- PFSA, 2017 document)

On the contrary to this IUCD had the lowest average DOS, which was about 4 days in 12 months. Besides these the other FP products have the medium range of DOS and frequencies of DOS with respect to the rest of FP pharmaceuticals which have about 2 and 4 respectively.

According to the survey and the above (Figure9) it can be seen that Minipills and COC was understock as their month of stock was below 2 months. The month of stock of Medroxyprogestrone was about 3 months in average which was normal. On the other hand the month of stock of products like Jadelle were about 5 as well as those of IUCD and Inplants was 13 and 7 respectively which indicates that it was much higher than the required standard which should not exceed 4 months at the maximum level and 2 months at the minimum level.

CHAPTER 5

5. Summary, Conclusions and Recommendations

5.1 Summary and conclusion

The collected quantitative data for analysis of supply chain management practice of FP pharmaceuticals in the selected health facilities at Addis Ababa was analyzed using SPSS version 23 and excel. As per the study different indicators of the SCM was analyzed and presented using tables and figures. These results are summarized as following.

1) On LMIS facilities use the previous RRF, Bin cards and both of them as the source of their information. In average 60 HFs use Bin cards for their FP pharmaceuticals. So this indicates that 94% of the facilities have had bin cards for their pharmaceuticals. From this HFs 58 of them have updated their Bin cards and it will become 92.10% in percentage.

Storage condition was assessed using 12 criteria and minimum was 85% and maximum was 100% indicating that the storage condition almost all HFs were in a better condition.

2) With respect to DOS only two products had contained the higher amount of (COC and Minipills). The survey had also showed these two products have the highest frequencies of stock out. But remaining products had showed lesser amounts of DOS and frequencies of stock out. According to the survey, COC had the average DOS of about 30 days and Minipills had about 19 DOS. On the contrary to this IUCD had the lowest average DOS, which was about 4 days in 12 months. Besides these the other FP products have the medium range of DOS and frequencies of DOS with respect to the rest of FP pharmaceuticals which were about 2 and 4 respectively.

3) Month of stock of products like Minipills and COC had less than 2 months of stock which indicates their SOH were below the standard which should be 2 months at the minimum and 4 months at the maximum. The other products like Jadelle and Inplants had month of stock of 5 and 7 respectively which were somehow over stock. Additionally IUCD had far greater month of stock which is about 13 months.

Operational Performance

On Reliability Statements

It can be seen that HFs were at good level of providing the right quantity of FP for their DUs.

HFs has no problems on providing FP pharmaceuticals with correct packaging.

HFs has also no problem on providing high quality pharmaceuticals to their respective DUs.

Responsiveness

The data indicates that there is a situation in which FP pharmaceuticals are dispensed to their DUs per their schedule.

Most of the HFs have agreed that they issue FP commodities as per schedule, on time after requisition and they issue FP commodities requested

Agility

In most of the HFs, there were a system of adapting quickly to a system of stock managing when there were stock out and new arrivals.

Major Challenges Of FPC SCM Practices

Spear man's correlation shows that there is positive correlation between FP Commodities SCM and human resources n=64 significant (2 tailed)= 0.015 $p<0.05$ accepted, education and training n=64, significant (2 tailed)= 0.001, $p<0.05$ accepted, environmental factors n=64, sig(2 tailed)= 0.013 $p<0.05$ accepted, information sharing and flow n=64, sig(2 tailed)= 0.012 $p<0.05$ accepted, mutual understanding and trust n=64, sig(2 tailed)= 0.031 $p<0.05$ accepted, supply chain relationships n=64, sig(2 tailed)= 0.001 $p<0.05$ accepted, consumers demand n=64, sig(2 tailed)= 0.043 $p<0.05$ accepted.

Eventhough it have expected that there is a correlation between top management commitment, information technology, religions and cultures, and supply chain management FP Commodities, Pearson's correlation indicates that: cultures (n=64, sig (2-tailed) =0.123, $p>0.05$), religions n=64, sig(2 tailed) =0.910, $p>0.05$, top management commitment n=64, sig(2 tailed)= 0.054, $p>0.05$, information technology n= 64, sig(2 tailed)= 0.164, $p>0.05$ therefore, rejected! indicating that there were no actual correlation between them.

5.2 Recommendation

As it had been able to be watchful from the survey that:-

- All HFs should be able to utilize and update bin cards for all FP pharmaceuticals.

- All HFs should be able to fulfill storage condition guidelines all in all.

-As the FP products are vital for all HFs, they should be available all the time for all of health organizations.

- HFs should be able to make the minimum month of stock of all FP pharmaceuticals 2 months for the minimum level and 4 months for the maximum level.

- All HFs should try to make the working environment suitable i.e. prepare dispatch area for all storage rooms.

- All top managements should be able to help pharmacy professionals in sustaining SCM of FP pharmaceuticals, e.g. knowing the schedule of issuance.

- The mutual understanding and trust between the supplier and the utilizing HFs should be enhanced so that the SCM system of pharmaceuticals will not be hindered.

- The utilization of information technology utilization should be surmounted by preventing the failures of Dagu system.

- There should be a system of giving education and training so that Pharmacy experts will not be bothered to accomplish their SCM related duties within their respective organizations.

5.3 Future research recommendation

As there are HFs those being newly inaugurated the future researchers should be able to incorporate them and other remaining organizations so that all conditions that are available within the city will be explored. Additionally it will help the city as well as the country Ethiopia know the parameters those are important to improve the challenging SCM of the FP as well as other health commodities

References

Alemu T., Jemal A., Gashe F., Suleman S., Sudhakar S., and Fekadu G. (2020) IPLS Implementation in selected health facilities of Ethiopia, the case of four Wollega zones',

Baihaqi, I., and Beaumont, N., (2018) Information Sharing in Supply Chains: a Literature Review, Department of Management Monash University, Victoria, Australia

Chen, D., (2013) Enhancing hospital supply chain performance: A relational view and empirical Test. Journal of Operations Management, 31 (6), 391 – 408.

Field, A., (2006) Discovering Statistics Using SPSS. 2nd Edition, Sage, London.

Gomez-Cedeno et al., (2015) supply chain orientation or supply chain management implementation.

Gonie, A., Wudneh, A., Nigatu, D., and Dendir, Z., (2018) Determinants of family planning use among married women in bale eco-region, southeast Ethiopia; a community based study,women's health

Holy Bible King James Version 1664

Meseret, Z., (2018) Analysis of Supply Chain management of Mother, Neonatal and Child Health Related Commodities in Public Health Facilities of Addis Ababa

Ministry of Health, (2012) A situation analysis of family planning in Ethiopia

MOH (2011) National guide line for family planning services in Ethiopia

MOH (2011) A situational analysis of family planning in Ethiopia

MOH (2016) Quantification of health commodities, RMNCH supplement, updated.

Mohammed H, 2006, Assessment of Contraceptive Logistics Management Information System in Addis Ababa City Administration

Narkotey AM, (2012) 'Inventory Management in the Ghana health service and its role in health care delivery': a case study of health facilities in HO Municipality.

Mukasaa, B, Alib,M , Farronb, M and Weerdt, R.(2017) Contraception supply chain challenges: a review ofevidence from low- and middle-income countries VOL. 22, NO. 5, 384–390

Nagitta, P. (2019) A Supply Chain Coordination Framework For Malaria, University Of South Africa, Treatment Therapies In General Hospitals In Uganda.

PFSA (2015) 'Ethiopia: National Survey of the Integrated Pharmaceutical Logistics System'

PFSA (2017) 'Standard Operating Procedure manual for the Integrated Pharmaceutical Logistic system' in Health facility of Ethiopia.

Shukla, P., and Jafri, S., (2018) Impact Of Supply Chain Management In Human Resource

Salam, GR., 2020 The Influence of Religion on Family Planning Practices

Tiye, K., and Gudeta, T., (2018) 'Logistics Management Information System performance for program drugs' at public Health facilities of East Wollega, Oromia Regional State, Ethiopia. BMC Medical Informatics and Decision Making (2018)

Tigist, Z., Bekele, D., Berhanu, E., Worku, Y., Deyasa, N., and Tesfaye, M.,(2020) '' family planning aware ness, utilization and associated factors among women of reproductive age attending psychiatric out patient care, a cross-sectional study,'' addis ababa , Ethiopia

Zikmund, W.G., Babin, B.J., Carr, J.C. and Griffin, M. (2010) Business Research Methods

Annexes

Annex 1: Data Abstraction-formats and Observation Check lists

Table 1: Stock Status

Groundwork: Be sure you have access to the Bin cards for the FP items

The store personnel who manages the FP items stock

Note: For any product that experienced a stock out in the last 12 months (including the day of the visit), please note reasons by product.

S.N	Tracer Drugs (TD)	Bincard available? (Y/N)	Bincard updated. (Y/N)	Balance on bincard (#)	Stock-out most recent 12 months?(Y/N)	Number of stock-outs (most recent 12 months)(#)	Total number of days of stock-out(s)(#)
	1	2	3	4	5	6	7
1	Minipills						
2	COC						
3	Medroxyprogesterone						
4	Jadelle						
5	IUCD						
6	Inplants						

Table 2: Storage and storage conditions

No.	Description	Yes	No	Comments
01.	Products are arranged systematically (pharmacological/ alphabetical)			
02.	Products are arranged so that identification labels are visible.			
03.	The products are stored and organized in a manner accessible for first-to-expire, first-out (FEFO) issuing.			
04.	Cartons and products are in good condition, not crushed due to mis-handling. If cartons are open, determine if products are wet or cracked.			
05.	Damaged and/or expired products/FP items are separated from usable products and removed from Shelf			
06.	Products are protected from direct sunlight			
07.	Cartons and products are protected from water during all seasons			
08.	Storage area is always free from harmful insects and rodents. (Check the storage area for traces of rodents [droppings or insects].)			
09.	Security devices (grilles for windows and doors made of glass, and lock and key) are			

	in place			
10	Products that need cold temperature are stored in a functional refrigerator.			
11.	Storeroom is maintained in good condition (clean, all trash removed, strong shelves, organized boxes)			
12.	The current space and organization is sufficient for existing products and reasonable expansion (i.e., receipt of expected product deliveries for foreseeable future).			

Annex 3

List of HFs

1 Ababa Bikila Hc	35 Gotera Masalecha HC	69 Saris HC
2 Abenet HC	36 Gutomeda HC	70 Selam Fire HC
3 Abyssinia Hc	37 Hidasse HC	71 Selam HC
4 Addis Hiwot HC	38 Hiwot Amba HC	72 Serti HC
5 Addis ketema W3 HC	39 Janmeda HC	73 Shegole HC
6 Addis ketema W7 HC	40 Kality Catholic HC	74 Shiromeda HC
7 Addis Reay Hc	41 Kality HC	75 Simegn Kebede HC
8 Afenchober HC	42 Kassanchis HC	76 Sumit HC
9 Akaki HC	43 Kebena HC	77 Teklehaimanot HC

10 Akaki kaliti HC	44 Kela HC	78 Tibebe Bekechene HC
11 Alembank HC	45 Kilinto HC (Akaki Kalit)	79 Tirunesh Bejing
12 Amoraw HC	46 Kirkos HC	80 Tuludimtu HC
13 Arada HC	47 Kolfe HC	81 Woreda 01 HC Yeka
14 Baeta HC	48 Kolfe W9 HC	82 Woreda 07 HC Yeka
15 Beleteshachew HC	49 Korea Zemach Hc	83 Woreda 1 Kolfe susbity
16 Bole 17 HC	50 Kotebe HC	84 Woreda 10 HC (A/Ketema)
17 Bole 17/2 0 HC	51 Lideta HC	85 Woreda 10 HC (N/L)
18 Bole Bulbula HC	52 Lomimeda HC	86 Woreda 10 HC Yeka s
19 Chefe HC	53 Maichew HC	87 Woreda 11 HC Yeka
20 Chirchil Hc	54 Meri HC	88 Woreda 12 HC
21 Dafim Hidase HC (Lideta)	55 Meshuwalekia HC	89 Woreda 13 HC Yeka
22 Dilfre HC	56 Mikililand health center	90 Woreda 14 HC
23 Efoyita HC	57 Minilik HS	91 Woreda 2 HC
24 Entoto Fana HC	58 N/s w06 HC	92 Woreda 3 Kolfe susbity
25Entoto No. 2 HC Yeka subcity	59 N/S/L Wereda 03 HC	93 Woreda 5 HC
26 Entoto No.1	60 N/S/L Wereda 05 HC	94 Woreda 6 HC
27 Felege Hiwot Hc	61 N/S/L Wereda 09 HC	95 Woreda 6 HC (Kolfe
28 Felegemeles HC	62 N/S/L Wereda 11 HC	96 Woreda 8 Kolfe subciity
29 Feres Meda Hc	63 N/S/L Wereda 12 HC	97 Woreda 8 Milinium HC

30 Gandi HS	64 NSL Woreda 01 Hc	98 Yehidase Fire HC
31 Gelan HC	65 Philipos HC	99 Yeka HC
32 Gergi HC	66 Ras Desta HS	100 Yekatit 12 HS
33 Ginbot 20 Hc	67 Rasemeru HC	101 Zewditu HS
34 Goro HC 68 Samen H	102. Abebech Gobena MCH Hospital 103 N/S/L/W10 HC	
104. N/S/L/W/10 HC		

Here are my research instruments presented as follows

Addis Ababa University

School of Commerce

Graduate Program in Logistics and Supply Chain Management

Dear /colleagues

Nice day

I am called Biru Sima. I am currently conducting research on factors affecting supply chain management of family planning commodities. I am conducting this study their by it may curb the problems of drugs interruptions. Hence your facility is one of organization where I want to collect real data regarding this country issue area. Generally my aim will not become successful without your industrious attitude and good will. The data I will obtain from you will help me in partial fulfillment of masters degree in supply chain management and finally I want to thank you for the good help you are going to provide me.

Yours sincerely

Biru Sima cell phone + 251 910 445904 biru.sima@yahoo.com

Facility type: Hospital □ Health Center □

Health facility code:

Interviewer: Biru Sima

Date of Interview:_____

Additional general ideas (if any):_____

Annex 5: Questionnaire to identify facilitators/ drivers FP supply chain management(Supportive supervision Practices and workforce at pharmacy units)

Health facility code: _

Date: _____

S.N	Questions	Response	If your answer is "No"
1	Gender	Male ☐ Female ☐	
2	What is your profession?	Pharmacist ☐ Druggist ☐ Other (Specify):_____	
3	How long have you worked in your current position?	1-3 years ☐ 4-7 years ☐ 8-10 years ☐ Above 10 years ☐	
4	How many staffs are working in the Pharmacy units?	_____	
5	Did you have Supply Chain Management related training?	Yes ☐ No ☐	Go to Q 7
6	If yes, for question "5", can you mention	IPLS ☐	

	the type of training that you took?	Supply Chain Over View ☐ SCM M and E ☐ LCM ☐ Quantification and forecasting ☐ Other (Specify):_____	
7	Did you receive supportive supervision (mentorship) on management of FP items in last 6 months?	Yes ☐ No ☐	Go to Q11
8	If yes, for question "7" who provided the support?	AACAHB ☐ Sub City ☐ Lead Hospital ☐ Partners supporting HIV Program ☐ Other (Specify): _____	
9	If yes for question "7" how often in the last 6 months?	Monthly ☐ Quarterly ☐ Bi-annually ☐ Irregularly (No schedule) ☐ Other (specify):_____	
10	Did the supervision help you to improve SCM of FP commodities?	Yes ☐ No ☐	

11	What are the challenges of FP commodities Supply Chain Management? (on availability quantification, distribution, storage, reporting, transportation FP items)	External Challenge:_____ ___ Internal Challenges:_____	

Annex 6: Supply Chain Management Practice: Inventory Management Practices at the Pharmacy store

Health facility code: _

Unit: _____

S.N	Questions	Response	If your answer is "No"
1	Gender	Male ☐ Female ☐	
2	What is your profession?	Pharmacist ☐ Druggist ☐ Other (Specify):_____	
3	How long have you been working in your current position?	1-3 years ☐ 4-7 years ☐ 8-10 years ☐ Above 10 years ☐	
4	Did you take store management training?	Yes ☐	

		No ☐	
5	Did you take Supply Chain Management related training?	Yes ☐ No ☐	Go to Q 7
6	If yes, for question "5", can you mention the type of training that you took?	IPLS ☐ Supply Chain Over View ☐ SCM M and E ☐ LCM ☐ Quantification and forecasting ☐ Other (Specify):_____	
7	Do you conduct physical inventory of FP items in the store?	Yes ☐ No ☐	Go to Q 9
8	If yes for question "7" how often do you conduct physical inventory?	Bi-weekly ☐ Quarterly ☐ Annually ☐	
9	When do you review FP commodities stock?	When receiving ☐ While issuing ☐ When generating RRF ☐	
10	What recording tool do you use to record FP SCM transaction?	Bin card ☐ Dagu-software ☐	

		Excel spreadsheet ☐	
11	What is minimum stock level the facility used to reorder FP products?	Bi-monthly ☐ Quarterly ☐	
12	Have you ever encountered emergency order level in the last six months for FP commodities?	Yes ☐ No ☐	Go to Q 14
13	If yes to question "12", what was the reason?	Longer lead time ☐ Late reporting ☐ Late delivery of RRF to EPSA hub ☐ Other (specify):_____	
14	Have you ever encountered stock out in the last six months for FP?	Yes ☐ No ☐	Go to Q 16
15	If yes to question "14", how did you manage the stock out?	By EO ☐ Borrowing from other facilities ☐ Didn't do anything ☐ Other (specify):_____	
16	What are the challenges of FP Supply Chain Management? (on availability quantification, distribution, storage,	External Challenge:_____ ____	

	reporting, transportation FP)	Internal Challenges:_____ _	

Annex7: Supply Chain Management Practice: Logistics Management Information System (LMIS) practices at pharmacy units

S.N	Questions	Response	If No Go to/ Comments
1	Who did supply FP is the last 6 months?	AACAHB ☐ Respective Sub City ☐	
2	Which LMIS format did you use for reporting and ordering FP commodities?	RRF ☐ Just letter indicating stock out ☐	
3	What FP logistics data are reported on LMIS?	Stock on hand (Useable) ☐ Quantity received ☐ Consumption ☐ Losses ☐ Adjustments ☐	
4	Who is responsible in reporting and	Store Manager	

	ordering FP commodities in this facility?	☐ Supply Chain Manager ☐ Pharmacy Head ☐	
5	How often do you report FPfor your respective supplier?	Monthly ☐ Bi- monthly ☐ Quarterly ☐ Whenever Stocked out ☐ Other (Specify):_____	
6	What are the data sources for the report?	DAGU ☐ Bin card (Manual) ☐	
7	Did you submit FP report recently?	Yes ☐ No ☐	Go to Q 9
8	If yes for question "7", is it reported on time?	Yes ☐ No ☐	
9	If No for question "8", what is/are the reasons?	Power interruption ☐ Workload ☐ Lack of reporting format (RRF) ☐	

10	Have you ever placed an emergency orders in the past 6 months for FP items?	Yes ☐ No ☐	Go to Q 12
11	If yes to question "10", how many emergency orders were placed in the past 6 months for FP items?		

Annex 8: Supply Chain Management Practices: Distribution and transportation practices at pharmacy units

S.N	Questions	Response	If No Go to/ Comments
1	How often do you receive supplies?	Bi- monthly ☐ Quarterly ☐ Whenever EPSA hub delivers ☐	
2	Who is responsible for transporting FP to your facility?	Respective EPSA hub Vehicle ☐ Sub city Vehicle ☐ Facility Vehicle	
3	By what LMIS format testing DUs report and resupplied FP items?	IFRR ☐ Old model 20 ☐	

		Model 20/Health ☐	
4	What data does the DUs report on the reporting formats?	Beginning balance ☐ Quantity received ☐ Losses ☐ Adjustment ☐ Stock on hand (Ending balance) ☐	
5	What are the data sources for the report?	Bin card (Manual) ☐ Previous report ☐	

Annex 9: Operational performance of FPs Supply Chain Management

Regarding the supply chain performance (Reliability, Responsiveness and Agility) of your health facility, please thick the appropriate box to indicate the extent to which you agree or disagree with each statement. The item scales are five-point Likert scales with 5 = strongly agree, 4 = agree, 3= neutral, 2= disagree, 1 = strongly disagree.

S.N	Reliability Statement	1	2	3	4	5
1	You provide the right quantity of FP for DUs as per their request					
2	You provide the FP items with correct packaging for dispensing units					
3	Providing FP items which has high quality					

4	You give vouchers (model-22) having complete information for testing units during issuing of FP					
	Responsiveness Statement	1	2	3	4	5
1	You issue FP items for dispensing units as per their schedule					
2	You provide the FP on time after their requisition					
3	You deliver the item of FP units requested					
	Agility	1	2	3	4	5
1	You adapt quickly to a system of stock managing when there is stock out					
2	You adapt quickly to a system of stock managing when new FP logistics is arrived					
3	You monitor the overall FP logistics Value at Risk (VAR)					

Additional general ideas (if any):

Annex 10: Major challenges of FP items supply chain management practices

Regarding the challenges that affect the FP supply chain performance (Company environment, Top management commitment, Mutual understanding and Trust, Information Sharing and Flow, Consumers demand, Information Technology, Supply chain relationships, Human Resource, and Education and Training) of your health facility, please thick the appropriate box to indicate the extent to which you agree or disagree with each statement. The item scales are five-point Likert scales with 5 = strongly agree, 4 = agree, 3= neutral, 2= disagree, 1 = strongly disagree.

S.N	Company environment	1	2	3	4	5

1	The storage area is suitable to maintain the quality of FP?					
2	The storage area has dispatch unit to provide the on time FP items delivery to DU's					
	Top management commitment	1	2	3	4	5
1	Helps the supply chain unit in a way that the quality of FP items is maintained					
2	Monitors the issuing of FP items for DUs as per their schedule					
3	Follows the supply chain unit adapt quickly to a system of stock managing when new FP item arrives					
	Mutual understanding and Trust	1	2	3	4	5
1	Your facility has mutual understanding and trust with the supplier in availing FP items which has high quality					
2	EPSA delivers FP for your facility as per RRF					
3	Your facility collaborates with EPSA to adapt quickly to a system of stock managing when there is FP item stock out					
	Information Sharing and Flow					
1	You give vouchers (model-19) having complete information for EPSA during receiving FP items					
2	Information sharing with EPSA enables the on time delivery of FP items					
3	The right information sharing and flow helps to adapt quickly to a system of stock managing when there is FP items stock out					

	Consumers demand					
1	The facility provides high quality FPs as per the consumers demand					
2	The facility provides FP items on time as per the consumers demand					
3	The facility tries to adapt quickly to a system of stock managing when there is stock out to fulfill consumers demand					
	Information Technology					
1	The facility has automated system to supply the right amount of FP items for DUs as per their request					
2	The facility has automated system to manage the on time supply of FP items for dispensing units as per their request					
3	The automated system helps the facility monitor the FP items value at risk					
	Supply chain relationships					
1	The facility has good supply chain relation with EPSA so as to supply the right amount of FP items as per their request					
2	The facility has strong supply chain relation with EPSA to manage the on time supply of FP items					
3	The facility has strong supply chain relation with EPSA to adapt quickly to a system of stock managing when there is stock out					
	Human Resource					
1	The facility has enough supply chain experts to supply the right amount of FP items as per request					
2	The facility has enough supply chain experts to manage the on time					

	supply of FP items					
3	The facility has enough supply chain experts to adapt quickly to a system of stock managing when there is stock out					
	Education and Training					
1	The facility placed a system to provide supply chain management related capacity building so as to supply the right amount of FP as per request					
2	The supply chain experts are trained to manage the on time supply of FP items to the DU's					
3	The supply chain experts has the skill and knowledge how to adapt and manage the FP items stock when there is stock out					
	Religious factors and cultural factors					
1	Clients coming to your clinic complain using the contraceptive due their religion					
2	Clients coming to your clinic say some thing about their culture so that it hinders the usage of the FP programmes					
3	Clients don't mention the issue of their religion on the usage of FP programmes					
4	Clients don't mention that using FP opposes their culture					