ASSESSMENT OF INTEGRATED PHARMACEUTICAL LOGISTIC SYSTEM IMPLEMENTATION ON THE BLACK LION HOSPITAL

BY
HENOCK SHIMELESS
(ID.NO: 9594/10)

A THESIS SUBMITTED TOTHE ADDIS ABABA UNIVERSITY, SCHOOL OF COMMERCE FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF ARTS IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT

ADVISOR: SHIFERAW MITIKU (PHD)

MAY, 2019

ADDIS ABABA, ETHIOPIA

ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS,SCHOOL OF COMMERCE

ASSESSMENT OF INTEGRATED PHARMACEUTICAL LOGISTIC SYSTEM IMPLEMENTATION ON THE BLACK LION HOSPITAL

By

Henock Shimeless

(ID.No: 9594/10)

APPROVED BY BOARD OF EXAMINERS AND ADVISORS

1. Shiferaw Mitiku (PhD)	_____	_____
Advisor	**Signature**	**Date**
2. Matiwos Ensermu(PhD)	_____	_____
Internal Examiner	**Signature**	**Date**
3. Abebe Ejigu(PhD)	_____	_____
External Examiner	**Signature**	**Date**

DECLARATION

I the undersigned, hereby declare that the work which is presented in this thesis entitled ***"ASSESSMENT OF INTEGRATED PHARMACEUTICAL LOGISTIC SYSTEM IMPLEMENTATION ON THE BLACK LION HOSPITA"*** is the original work of my own effort and done under the guidance of Shiferaw Mitiku (PhD), and that all the sources of materials used for the study have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other university for the purpose of earning any degree.

Declared by:

Henock Shimeless _____ _____

Student Signature Date

Certification

This is to certify that Ato Henock Shimeless has carried out this thesis work on the topic entitled ***"ASSESSMENT OF INTEGRATED PHARMACEUTICAL LOGISTIC SYSTEM IMPLEMENTATION ON THE BLACK LION HOSPITA"*** is the original work of my own effort and done under the guidance of Shiferaw Mitiku (PhD), and that all the sources of materials used for the study have been duly acknowledged.This thesis has been submitted to Addis Ababa University School of Commerce Graduate Studies for examination with my approval as a university advisor.

Shiferaw Mitiku (PHD)_____ _____

Advisor **Signature** **Date**

Acknowledgment

First and foremost, my sincere and deepest reverence and gratitude goes to the Almighty God for providing me the strength, grace and knowledge to finalize this thesis work successfully.

Next, my respectful thanks and gratitude goes to my advisor, **Shiferaw Mitiku (PhD),** for his great support, encouragement, and guidance he provided me through the course of this thesis work and also for his valuable comments and suggestions without which the accomplishment of this work could not be realized.

I also want to express my thanks to the Black Lion Hospital especially the Pharmacy section staff for their cooperation, support they provided and willingness they showed me during time of data collection process

Last but not least I want to extend my deepest heartfelt thanks to my family for their encouragement and support, while I was doing this research work.

The Researcher.

TABLE OF CONTENT

DECLARATION…..... ii
CERTIFICATION…..... iii
ACKNOWLEDGMENTS…..... iv
TABLE OF CONTENT…..... v
LIST OF TABLES……..... vii
LIST OF ACRONYMS & ABBREVIATIONS…..... viii
LIST OF FIGURES …..... ix
ABSTRACT……..…. x
CHAPTER ONE…… 1
1. **INTRODUCTION** 1
1.1. Background of the Study…..... ……. 1
1.2. Statement of the Problem.....……..…….....…… 3
1.3. Research Objective……..…… 5
1.4. Research Question…….…….....…… 5
1.5.Scope of the Study……..……..…… 5
1.6.Delimitation of the study……..…….....…… 5
1.7. Definition of terms/ Operational Terms……..…….…….....…… 6
1.8.Organization of the study……..……..…… 6
CHAPTER TWO…….. 7
2.REVIEW OF RELATED LITERATURE..... 7
2.1. Theoretical Literature Review…….…….....…… 7
2.1.1. Pharmaceuticals Supply chain management…..... …….. 7
2.1.2. IPLS in Ethiopia…….…..... 7
2.1.3. Previous studies and reports in IPLS…..... ……. 9
2.1.4. Pharmaceuticals Supply Chain in Ethiopia……..... 11
2.1.5. Pharmaceuticals Supply Chain distribution……..... …….. 13
2.1.6. Monitoring and Evaluation……..... ……. 14
2.1.7. Inventory management and proper storage……..... 15
2.1.8. Challenges of Supply Chain Management……..... …….. 15
2.1.9. Health Care Supply Chain Management……..... 15
2.1.10. Supply Chain Performance Measurement……..... ……. 16
2.2. Empirical Literature Review…..... 17
2.2.1 .Pharmaceutical Supply Chain……..... 17
2.2.2. Performance of supply chains…..... 19
2.2.3. Conceptual framework of the study…….....……. 20
2.2.4. Identified Literature gap…..... 20
CHAPTER THREE…… 22
3.METHODS OF THE STUDY 22
3. 1.Description of the study area..... 22
3.2. Researchdesign…..... 23
3.3. Research approach …..... 23
3.4. Population and Sample Design…..... 23
3.4.1.Data source and type…..... 23
3.5. Data collection Procedure…..... 24
3.6. Ethical Considerations…..... 24

3.7. Method of data analysis..... 24
3.7.1Validity and Reliability test…..... 25
CHAPTER FOUR……..... 27
4. RESULTS, DISCUSSION, AND INTERPRETATION……. 27
4.1. Profile of the Respondents..... 27
4.2. The roles of IPLS implementation on the performance..... 28
4.3. IPLS Implementation and its Challenge for IPLS..... 36
4.4. Factor hindering (challenge) the IPLS..... 40
CHAPTER FIVE…… 45
4. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS……..…… 45
5.1Conclusions..... 46
5.2 Recommendations..... 47
5.5 Suggestions for further research..... 48
References..... 49
Annex I. (Internal Facility Report and Resupply Form (IFRR))..... I
Annexes II (OPD Pharmacy Inventory)..... II
Annex III. (Questionnaire, interview guide)..... III
Annex IV. (Interviewprotcal)..... IV

LIST OF TABLES

Table 3.1 Statistical Package for Social Sciences (SPSS version 20) overall result is presented in the.....25

Table 4.1: Demographic Profile of the Respondents…….…….....27

Table 4.2.1:- The role of IPLS for Implementation in the BLH …….…….....28

Table 4.2.2 Summary of roles of IPLS implementation on the supply chain of BLH ……34

Table 4.3.1 IPLS Implementation and its Role to improve the organizational performance of BLH…….……36

Table 4.3.2.Summary IPLS Implementation and its Challenge to improve the Performance of BLH ……...39

Table: - 4.4.1 Factors hindering IPLS Implementation system in BLH …….……41

Table: - 4.4.2 overall summary of macro level Factors hindering IPLS Implementation system…….……44

LIST OF ACRONYMS & ABBREVIATIONS

AIDS: Acquired Immune Deficiency Syndrome

BLH: Black Lion Hospital

FMOH: Federal Ministry of Health

HEWs: Health Extension Workers

HIV: Human Immuno Virus

HPMRR: Health Post Monthly Report and Resupply Form

IFRR: Internal Facility Report and Resupply Form

IPLS: Integrated Pharmaceutical logistics system

LMIS: Logistic Management Information System

PFSA: Pharmaceutical Fund and Supply Agency

RHB: Regional Health Bureau

RRF: Report and Requisition Form

SCMS: Supply Chain Management System

SOP: Standard Operation Procedure

TB: Tuberculosis

USAID: United States Agency for International Development

WHO: World Health Organization

WoHO: Woreda Health office

ZHD: Zonal Health department

LIST OF FIGURES

Figure 1.1Flow of Pharmaceutical and informational Integrated pharmaceutical Logistics System (IPLS)……...12

ABSTRACT

BackgroundIPLS is a term applied to the single system for reporting and distribution pharmaceutical items based on the overall mandate and scope of the PFSA. This system aims to provide patients pharmaceuticals they need. In order for this system to be successful, it must fulfill all the six rights of supply chain management which are ensuring right type of item, of the right quality, in the right quantity, at the right place, at the right time and with the right cost. At a facility level, IPLS incorporates all the three logistic functions which are Logistic Management Information System, Inventory Control System, and Storage System of pharmaceuticals. The objectives of the study is intended to measure the performance of integrated pharmaceutical logistics system implementation in Black Lion Hospital. The study used explanatory (descriptive) research design whereby the IPLS System, the inventory control system and the storage system of the hospital was assessed and examined against the requirements and standards of IPLS. Purposive sampling technique was used to collect data. In addition, questionnaire & interview were some of the tools used in the data collection process. The result of IPLS implementation includes availability & proper use of the system, IPLS data quality, training and supervision on logistics management, stock availability, availability of expired items, fulfillment of acceptable storage conditions for drugs store room, resupply period, order fill rate, emergency order trends and major challenges on IPLS implementation are described as existing problems in the hospital. Inconclusion & recommendation with respect to some measurements such as availability of IPLS system, supervision and training, availability of drugs, resupply period, emergency order trend, and the effort towards IPLS implementation in the Hospital is encouraging. But much gap is observed in some other measurements such as in proper utilization of the system, IPLS data quality, and perceived an order fill rate and storage condition which leads to an overall conclusion that IPLS is not being implemented in the Hospital in full scale. In order to bring improvements, among other things, there should be regular supportive supervision and continuous training, in placing consistent monitoring and evaluation mechanisms, enforcing strict adherence to the IPLS procedures and standards, and increased commitment of top management.

Key Words: Pharmaceuticals, IPLS implementation system, integrated,logistic,drugs

CHAPTER ONE

INTRODUCTION

This chapter content background of the study which expelled about the study and the other research Problem which describe the problem, clarify the area of the study it also includeresearch Objective and Specific Objective, researchquestion/hypothesis, Scope of the Study, delimitation of the study, definition of terms/operational terms, organizations of the study.

1.1 Background of the study

Logistics can be defined as the part of supply chain which is concerned with planning, implementing, and controlling the efficient and effective forward and reverse flow and storage of different goods, services, and related information between the point of origin to the point of consumption for the sole purpose of meeting and satisfying customer requirements. (CSCMP, 2011).IPLS is a term applied to the single system for reporting and distribution pharmaceutical items based on the overall mandate and scope of the PSA. This system aims to provide patients pharmaceuticals they need. In order for this system to be successful, it must fulfill all the six rights of supply chain management which are ensuring right type of item, of the right quality, in the right quantity, at the right place, at the right time and with the right cost. At a facility level, IPLS incorporates all the three logistic functions which are Logistic Management Information System, Inventory Control System, and Storage System of pharmaceuticals. (PFSA IPLS SOP, 2015)

Each of these three IPLS components contains its own sets of indicators that are used to measure the status of IPLS implementation (i.e, gaps, progresses and performances) by measuring system leakage, assessing the availability and proper utilization of logistic management recording tools(e.g Bin card records..) and by determining the extent to which facility pharmacy personnel compete and submit quality LMIS reports(FMOH, 2010, FRDE PFSA, 2014).

Providing complete and acceptable health care services requires availability of safe, effective and acceptable drugs and pharmaceutical items with the right quality, right quantity and for the right patient/client at all times. In spite of this requirement, various supply chain management gaps such as stock non-availability, stock shortage, poor storage and poor stock management system, unaffordability and irrational drug use had been observed, in previous

times, in the Ethiopian Pharmaceutical Supply Chain Management System (PFSA IPLS SOP, 2015).

Pharmaceutical Logistic is the process of planning, implementing, and controlling procedures for the efficient and effective flow and storage of pharmaceuticals including services, and relate deformation from the point of origin to the point of consumption, for commodity security purposes(SPS, 2013).The healthcare supply chain is vast, diverse, and complex which presents many challenges to effective management. In health care supply chains, the principal participants include manufacturer's drugs, medical equipment, and hospital medical supplies, distributors, and medical Service provisions, medical groups, insurance companies, government agencies, employers, government regulators, and users of health care services (Burns & Lee, 2008).

In general, this study will be measuring the status of IPLS implementation at public health facilities in Black Lion Hospital, Ethiopia by using different variables such as availability of enough and trained staff, IPLS formats, and quality of Report and Requisition Forms (RRF) (complete, timely, and accuracy of facilities), adequate supportive supervision, inventory management system, good distribution practice (GDP) and others.

1.2. Background of the organization

Black Lion Hospital (TikurAnbesseain Amharic) is Ethiopia's largest specialized public teaching hospital. In 1998 Black Lion Hospital, which is also the largest referral hospital in the country was given to Addis Ababa University (AAU) by the Ministry of Health (Mohr) for the faculty as a main teaching hospital. The faculty is the oldest and the largest among the health training institutions in the country, staffed with the most senior specialists (Black Lion Hospital Directory).

Using a phase-based approach, and using three phases schedule, Integrated Pharmaceutical logistics system (IPLS) has been being implemented in most of the public health facilities in the country in which as part of the phase 1 approach IPLS has been implemented in black lion hospital since 2011 (Amara RHB, 2015, FRDE PFSA, 2014). Some routine health monitoring reports shows that IPLS has benefited in improving IPLS data recording and reporting, pharmaceutical storage and distribution practices and also availability of essential pharmaceutical items at the health facility level (PFSA IPLS SOP, 2015). Nevertheless, there is no much study done on measuring of IPLS implementation especially at the big health facility level like Black Lion hospital. Hence, this study is purposed to measure implementation of in Black Lion hospital so that gaps and challenges can be identified to forward relevant recommendations for further progress.

1.3. Statement of the Problem

In Ethiopia lack of proper management of medical equipment has limited the capacity of health institution to deliver adequate health care (FMOH, 2010). Supply chain problems like weakness of inventory control, irrational forecasting, and weakness of communication between store and outlets, wastage, stock out, delay in delivery, weak procurement strategy for lab reagents, weak Communication with facilities, poor quality supplies, inadequate involvement of biomedical unit in supply system negatively influence the health care deliver supply chain management that plans, implements, and controls the efficient, effective forward and reverses flow and storage of Pharmaceuticals, services and related information between the point of origin and the point of consumption in order to meet customers' requirement so logistics management is an integrating function, which coordinates and optimizes all logistics activities, as well as integrates logistics activities with other functions including marketing, sales manufacturing, finance, and information technology (USAID DELIVER,2011).

According to the Health Logistics Quarterly newsletter report in 2014, Ethiopia has been challenged in facing various public health pharmaceutical supply chain management systems where various multiple stakeholders involved were responsible for managing supply chain for various essential pharmaceutical items. (US AID/DELIVER PROJECT, 2014).

The Proper implementation of IPLS helps to reduces stock outs, delay in delivery, drugs expiry, and also improves product availability by ensuring continuous supply of drugs fulfilling the six rights of supply chain management which are availing the right products to patients, in the right quantity, of the right quality, at the right place, at the right time and for the right cost and hence better service of treatment for HIVAID patients. (PFSA IPLS SOP, 2014; USAID, LMIS M & E indicators, 2006).Firstly, IPLS is a big topic that encompasses three main components such as the Logistic Management Information System, the Inventory Control System and the Storage System of items and all these three components are addressed in this study. Secondly, in IPLS implementation different parties such as PFAA, health facility management, and different internal parties such as pharmacy professional are involved and the study could show role and impact of each party in proper implementation of the IPLS. thirdly, IPLS implementation is extremely important and sensitive especially for drugs like some as these drugs are very essential, costly, potentially lifesaving and poor implementation leads to death of patients and have significant impact on community/nations

wellbeing and fourthly, IPLS implementation can be successful with proper operation, in placement and consistent use of mandatory requirements such as availability and proper utilization of various logistic data reporting and recordingtools, data quality, supervision andmonitoring mechanisms and other facility requirements such as acceptable storage facility. And the studyhas addressed all these in a comprehensive way. Fifthly, IPLS implementation has a potential failure that requires early assessment of its operation; follow up, proper intervention and management commitments which reflects the importance of the study.

In addition to the above reasons, considering its importance, its impacts and contribution to promote health of individuals, community and nation at large, more researches on IPLS implementation focusing on some drugs supply chain at health institution level need to be conducted to investigate bottle necks and challenges to its proper implementation and investigate and identify further ingredients to its success and take necessary and quick interventions.

Therefore, as my pilot interview that I have done on the hospital the above mentioned challenge exist in the hospital, so this study try to assess the implementation of IPLS (Integrated Pharmaceutical Logistics System) in Black Lion Hospital and also as of any institute implementation of a new technology the hospital is also facing in adopting the technology, using relevant indicators that help to measure availability, proper use and functioning of the three components of IPLS which are the logistic management information system, the inventory control system andthe storage system.With all its importance, unless its proper implementation is studied and gaps and challenges of implementation are identified and appropriate measures are taken, all the consequences of poor implementation such as stock outs, delay in delivery, drug expiry and wastage of finance and resources will result with an ultimate negative impacts of poor health of the community. Such consequences are extremely sever and dire if IPLS is poorly implemented for ARV drugs supply chain management as these items are lifesaving and lifelong treatments for people living with HIV Aids and the negative consequences of poor implementation of IPLS for these items will result to treatment failure due to missed dose, developments of resistant strains of the virus, quick deterioration of health and death of patients.

1.3. Research Objective:

To assessment of integrated pharmaceutical logistic system implementation on the black lion hospital.

1.3.1. Specific Objective:-

- To determinethe roles of IPLS implementation on the supply chain performance of Black Lion Hospital.
- To measure the extent to which IPLS implementation improves the performance of Black Lion Hospital.
- To identify challenges that affect IPLS implementation in Black Lion Hospital.

1.4. Research Question

This study is expected to answer the following research questions

- What are the roles of IPLS implementation on the supply chain performance of Black Lion Hospital?
- To what extent IPLS implementation improves the performance of Black Lion Hospital?
- What are the major challenges hindering the IPLS implementation in Black Lion Hospital

1.5. Scope of the Study

The study is focused on assessing implementation of IPLS at Black Lion Hospital because of the wide nature of the subject of IPLS and because the large number of patients treated in the biggest referral hospital of Ethiopia (Black Lion Hospital), the scope of the study is limited in assessing implementation ofIPLS for drugs supply at Black Lion Hospital. The geographic scope of this study is limited to only on Black Lion Hospital. The study is focused on assessing implementation of IPLS at Black Lion Hospital Because time consternate of the wide nature of the subject of IPLS and because the large number of patients treated in the biggest referral hospital of Ethiopia (Black Lion Hospital), the scope of the study is limited in measuring implementation of IPLS for drugs supply at Black Lion Hospital.

1.6. Limitation of the study

One of the limitations of the study is lack of similar studies in Ethiopia that has created a gap to compare and contrast and make comparative conclusions. In addition, the focus of this study is measuring the availability and proper use of IPLS implementation tools & requirements, availability of drugs and identifying challenges of IPLS implementation at the health facility level. Hence it didn't look to the overall system implementation or drug availability at the higher supplying unit (PFSA).

This study focused on IPLS implementation for all drugs. Hence, because of the nature and significance of all drugs in treating the most life threatening illness, The focus of this study is measuring the implementation of IPLS mainly and the availability of selectedProgram tracer drugs selected by USAID public at health facilities and hospital PFSA hub; it wasn't to look at system implementation or availability at the ZHD, WOHO level and health posts found in the Zone that were part of this supply chain members and it wasn't assessed documentation and implementation at health facilities dispensaries in detail except availability of tracer drugs, Bin card and IFRR.

The study wasdone only in Black Lion Hospital since these facilities are distribution of commodities and collection of logistic information based on convenience data collection method. Because a representative survey of supply chain status prior to IPLS implementation was not found easily, it is difficult to compare current and previous implementation performance. The studies will attempt to compile data from various sources to provide as much comparative analysis as possible.

1.7. Definition of terms/ Operational Terms.

Performance measurementis defined as a metric to quantify the efficiency and effectiveness of operations *(*Kazemkhanlou*et al, 2014).*

Performance measurement System (PMS) can be defined a balanced and dynamic system that enables support of decision-making processes by gathering, elaborating and analyzing information (Kazemkhanlou*et al*, 2014).

Tracer Medicine: a selected type of drugs that are vital and essential and must be available at the health facilities. Availability and access of these medicines with proper quantity at health facility is usually an indication of good pharmaceutical supply chain management system.(Kazemkhanlou*et al*, 2016).

1.8. Organization of the study

This study is organized in the following five major chapters. Chapter 1presents general introduction to the thesis which begins with providing back ground information on the overall concept of IPLS followed by describing other components of the chapter such as statement of the problem, research question, objectives, significance, scope and limitation of the study. Chapter 2 presents a review of relevant literaturerelated to the subject matter IPLS including different empirical studies. Chapter 3 presents the methodology used in conducting the research. Chapter 4 presents the result (findings) and discussions part of the research work based on the analysis done. Finally, chapter 5 presents the summary, conclusion and recommendations of the research work and future research forward.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter content theoretical literature review which expelled about the existing theory of study and the other empirical literature review which describerelated studies, conceptual framework of the study which clarify the conceptual area of the study it also includeresearch identified literature gap.

2.1. Theoretical Literature Review

2.1.1 **Pharmaceuticals Supply chain management**

"The part of supply chain management that plans, implements, and controls the efficient, effective forward and reverses flow and storage of Pharmaceuticals, services and related information between the point of origin and the point of consumption in order to meet customers' requirement. Logistics management is an integrating function, which coordinates and optimizes all logistics activities, as well as integrates logistics activities with other functions including marketing, sales manufacturing, finance, and information technology'' (USAID | DELIVER, 2011).

In other words, logistics can be considered activities as the operational component of supply chain management, including quantification, procurement, inventory management, warehousing,distribution, transportation and fleet management, and data collection and reporting. Supply chain management includes the logistics activities plus the coordination and collaboration of staff, levels, and functions (USAID | DELIVER, 2011).

2.1.2 IPLS in Ethiopia

In order to enable successful implementation of IPLS, all of its three components/ functions should successfully be in place with all requirements of quality, availability and functionality as briefly described below. (FRDE, IPLS SOP, 2015)

A. Logistics Management Information System (LMIS) in IPLS

The purpose of Logistics Management Information System (LMIS) is to collect, organize, and report in formation to other levels in the system in order to make important logistic management decisions which govern the logistic system and ensure that all the six rights are fulfilled for each patient. Hence, for the successful and health operation of the LMIS, important LMIS tools (recording and reporting tolls) such as Bin Cards, Stock Cards, Internal Facility Report and Resupply Forms (IFRR), and Report and Requisition Forms (RRF)

should always be available as blank forms in the facility for use, and should also be used timely and accurately to record and report quality LMIS data. Proper, timely and accurate use of LMIS tools helps to have a good quality, timely and well organized LMIS data that would help to make logistic management decisions at higher level like PFSA for timely resupply and appropriate refill of pharmaceuticals when requested by lower level facilities like Hospitals (USAID | DELIVER, 2011).

B. Inventory Control System in IPLS

The purpose of an inventory control system is to inform personnel when and how much of pharmaceutical item to order so that appropriate stock level of every items can be maintained each time to meet the needs of patients. A well-designed and well-functioned inventory control system helps to prevent shortages, stock outs, over supply, and expiry of pharmaceuticals which all are the ultimate goals of successfully implemented IPLS system. A well functioned inventory control system can be realized by marinating adequate stock levels of each item by analyzing the appropriate, timely collected and good quality LMIS data that have been collected by accurate and timely use of the LMIS tools(USAID | DELIVER, 2015).

In addition to preventing stock outs (ensuring stock availability), preventing expiry, over stock and wastage of pharmaceuticals, a well-functioning inventory control system will reduce frequent emergency orders that would happen due to under stock of items below the expected minimum levels of stock(USAID | DELIVER, 2011).

C. Storage pharmaceuticals in IPLS

Storing is the safe keeping of drugs to avoid damage, expiry, and theft so that items stored can remain useful throughout their shelf life. Poor storage condition will affect the quality of pharmaceuticals being stored. Rooms that are too hot, stacks of carton that are too high, and other poor storage condition can cause damage or deterioration of the pharmaceutical product that would contribute for reduction of shelf life. A well-organized store will keep items safe, help simplify the facility's work and reduces time wastage in trying to find needed items. Health facility pharmacy store improvement is one of the IPLS related pharmaceuticalmanagement initiatives which includes having a well-organized and well spacious store room that contains all the required storage facilities and adhering to the good pharmaceutical storage guidelines & practices(USAID | DELIVER, 2014).

2.1.3 Previous studies and reports in IPLS

It seems that some literatures records are observed with respect to IPLS relate studies in some African countries but very limited published research is observed in similar studies sin Ethiopia. A study conducted inLesotho2007 showed that 17percent out the overall or one thunder of Hospitals had SOP for medicine supply management system and 53percentfromthe overall or one thunder of facilities had stock record cards to keep stock record of reagents. And none of the facilities had a practice of separating damaged or expired items from usable ones which is one of a sign of poor storage management. In addition, the study showed that there is poor management and supervision in logistics management issues. (Pharasi B, 2007)

According to assessment of IPLS for the management of HIV/AIDS and TB laboratory diagnostic commodity in public health facilities in Addis Ababa in 2016, availability of IPLS formats for recording and reporting such as bin cards, internal facility report and requests(IFRR), and report and request forms (RRF) was reported in majority of facilities 92.6percent but Regular update of bin cards was reported to be low 61.5percent facilities, while IFRR and RRF were completed by 84.6percent and 92.6percent of facilities, respectively. Utilization of bin cards was higher at health centers, 76.5percent compared to hospitals, 33.3 percent. The report further shows that management support for IPLS implementation was significantly associated with improved data quality and utilization of IFRR. The study concludes its study stating that the majority of facilities reported the availability and utilization of IPLS tools to manage HIV/AIDS and TB laboratory commodities. However, most experienced stock out of one or more commodities during the last six months, which could be dueto failure to implement IPLS in full scale. (Tilahun A, Geleta DA, Abeshu MA, Geleta B, Taye B, 2016)

According to the national survey conducted by PFSA in 2015, the availability of blank bin cards, IFRRs, and RRFs are high at hospitals above 90 percent and health centers (close to 80 percent). However, the availability of the recording and reporting formats decline when moving down the supply chain. The availability of bin cards which are the fundamental logistics records that captures essential inventory data was 40 percent at the health post level. In addition, the study stated that the accuracy of balances on bin cards by facility level showed at hospitals, accurate balances ranged from 29 percent to 71 percent per different items with an average of 49 percent. The survey result also showed that there is a variation in use of RRF by phase of IPLS implementation (phase I, II, and III). For Example, The RRF

use was high (97 percent) among phases I and II facilities, both in hospitals and health centers. This was not the case for phase III health centers, where 54 percent used the RRF. (Shewarega, Abiy, Paul Dowling, WelelawNecho, Sami Tewfik, and YaredYiegezu, 2015)

A study on the assessment of training coverage on the integrated pharmaceuticals Logistics system at selected health facilities in four regions of Ethiopia in 2012 showed that, the percentage of HEWs who had got a training on IPLS were 67 percent, 75 percent, 50 percent, and 63percent in Oromia, in Amhara, in Tigray and in SNNPR, respectively. (SC4CCM, 2012)

Health product supply chains in developing countries arefraught with many problems. Ineffective supply chains weaken the overall health system'sability to respond to the healthcare needs of thepopulation and put treatment programs aTrask (Yadav,Smith, and Hanson, 2012)

A study done In Kenya Shows the commercial supply chain has a highly fragmented pyramidal structure, with a few manufacturers at the top and a large but undefined number of retailers at the base. The distribution of suppliers is skewed in favor of urban locations, creating a crowded environment there, and a large underserved market in rural locations (PSP4H, 2014).

Asamoah*et al*. (2011) studied the pharmaceutical supply chain for anti-malarial drug in Ghana. It was found that there are two main supply channels i.e. private and public channels. But both chain lack information technology leading to disruption and delay in the Supply chain system. These lead huge implication in drug security and affordability. To achieve availability of drugs at the right time and place the availability of information infrastructure is mandatory for the supplychain(Yadav, 2015).

According to Health and Education advice and resource team study (2016)States Some African Countries (Kenya,Zambia, Uganda, Mozambique, Sierra Leone, Tanzania and Ethiopia) Have National pharmaceuticals procurement and Supply institutions. However these institutions have problems including; longer tier system, Weak information flows along the tiers, weak measurement of Supply chain performances, Transportation problem and weaksupply chain leadership.

2.1.4. Pharmaceuticals Supply Chain in Ethiopia

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

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

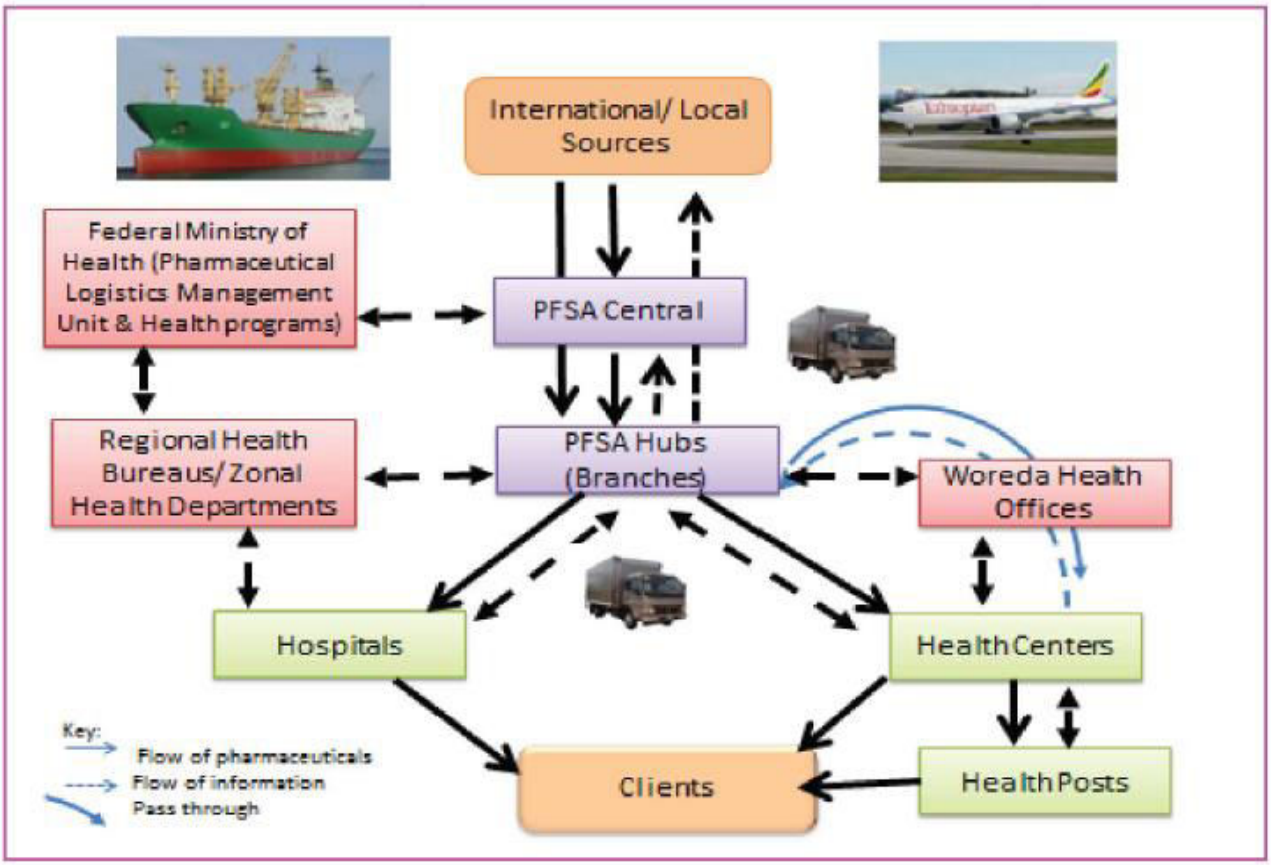


Fig. 2.1 Flow of Pharmaceuticals and Information in the Integrated Pharmaceutical Logistics System (IPLS)

Pharmaceuticals Supply Chain practices studied in different dissertations. Sewuye (2013) Studied the Supply Chain Management practices of Ethiopian pharmaceuticals manufacturing companies the result show factors that affect implementation of SC strategies in the company Pharmaceuticals supply Chain Management practices implemented in both hospitals and health center pharmacies include JIT supply, holding safety stock, few suppliers, close partnership with suppliers, close partnership with customers, Level of information quality (IQ) but many supplies also practiced only in governmental health a study done by Lissome work pharmaceutical distribution are observed; the available branches are not enough, Limitation in space in the warehouse, The frequency of delivery is very low, Poor forecast and challenges in different industry of Ethiopia were shows that it is not strong due to both internal and external company.(Tedila ,2015), pharmacies Center pharmacies. Techniques,

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

According to Frazelle (2002) the logistics of customer response includes the practices of developing and maintaining a customer service policy, monitoring customer satisfaction, orders entry (OE), order processing (OP), and invoicing and collections. Ronald (1997) argues that customers have been increasingly sensitized to expect quick response to their demands. He pointed out that rather than consumers having to accept the "one size fits all" philosophy in their purchases, suppliers are increasingly offering products that meet individual customer needs. This showed that the level of customer satisfaction shall be measured to make the required corrective action. Similarly, Frazelle (2002) argues that in today's just-in-time world the ability to respond to customers' requirements in ever-shorter time-frames has become critical. Most authors and practitioners agree that building and enhancing long-term relationships with customers generates positive returns to firms (Reichheld, 1993, 1996 as cited in Jones, Fox and Fabrigar, 2010).

Generally, the seasonality of footwear consumption in developed countries makes response more sensitive. Besides the firm level constraints for response, the country's infrastructure quantity and quality, mainly transport has a paramount influence on the customer response.

2.1.5. Pharmaceuticals supply Chain distribution

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

Pharmaceuticals distribution is the process of transferring products from the source of supply to the place of consumption. It is the art of getting the right type and amounts of commodities to theright places at the right time to the right facility. It involves transportation, delivery, and receivingof commodities, proper storage, and inventory control for receipt and disbursement andinformation systems(PFSA, 2016).

Information and reliable data is necessary to measure performance and determine Key Performance Indicators. Therefore, some countries use site visits or meetings. However, only a few countries have defined indicators and performance measurements. Distribution indicators should monitor frequency, reliability and condition of transport vehicles (USAID, 2011c)IPLS improves the drug supply chain by integrating drug requisition, distribution, and reporting into a single mechanism in Ethiopia using PFSA of FMOH as leading agent (Muluken,*et al* 2015).

2.1.6 Monitoring and Evaluation

Routine monitoring and periodic evaluation of the pipeline and logistics system activities help demonstrate how well the system is performing, the areas that can be improved, as well as the system's impact on service provision. Monitoring refers not only to the quality of the product, butalso to the quality of the work and appears between each activity of the logistics cycle (Desalegn, 2015).WHO outlines that there are weak mechanisms for monitoring and evaluation (M&E) of medicine availability at Health facilities. Therefore, WHO are committed in offering financial and technical assistance to develop M&E tools, to share and document good practice and to implement M&Esystems?Performance indicators and tools shall be developed, which monitor performance of the whole supplythe pharmaceutical distribution chain is composed of manufacturers, distributors (wholesalers and importers), and retailers (public and private pharmacies, drugstores, online sellers, supermarkets, and dispensing doctors). In most developed countries, the various stakeholders' inthe supply chain is regulated extensively to improve the affordability and availability of medicines as well as maintain levelsof service. In many low- and middle-income countries, the distribution chain is neither regulated nor subject to any formal oversight and, as a resultcontributes to problems of availability and affordability of medicines (Kanavos, Panosetal, (2014).

According to Kanavos *et al*(2013)excessive fragmentation is an important difference between developed and developing countries' drug distribution systems. In developed countries, comparatively few large firms control the market and regulatory authority'srequires some chain of custody documentation. In low and middle-income countries, the system is vastlymore complicated. Sometimes multiple parallel distribution systems of varying efficiency run inthe same country Ethiopian pharmaceutical distribution system is a typical three-level distribution system, the physical size of the central or branch warehouses is determined by national or regional demand for Pharmaceuticals and by the supply frequency

Pharmaceuticals distributed to health facilities from nearby PFSA branches in Ethiopia pharmaceuticals distributed through two mechanics (Sewuye, 2013).

2.1.7 Inventory management and proper storage

Inventory management is as important as like as that of managing the money at the bank (Mark and Mike, 2015). After an item is ordered and received, it must be properly stored until thecustomer needs it. A country's inventory control strategy specifies how much stock to store andwhere to store it. Enough stock should be available to meet customer needs until a new order isreceived; but not so much that stocks expire or are wasted or that you exceed storage capacity.Storage has two purposes for products: (1) to ensure the quality or condition, and (2) to make themavailable for distribution (Desalegn, 2015).

2.1.8. Challenges of Supply Chain Management

Store*et al* (2006) has identified three core enablers and inhibitors for supply chain management in their study: transparency of information and knowledge; supply chain behavior; and performance measurement. The use of key performance indicators was guided by top-level business objectives or metrics pursued at functional level could at worst jeopardize the performance of the supply chain as a totality and the end customers 'needs were forgotten.

2.1.9. Health Care Supply Chain Management

The healthcare industry is of significant importance in both economic development and social welfare in modern economies. Healthcare is traditionally defined as the delivery of treatment and services to people in need of medical attention. Healthcare supply chain management differs from other application in term of key elements as it tends to be high costs for healthcare providers and heavy dependence on third party. There are multitudes of factors to be considered so as to ensure on-time delivery, protection and product integrity from origin to destination. This is a highly sensitive supply chain that everything less than 100 percent customer service level is unacceptable as it directly influences the health and safety (USAID, 2011).

In any business, a supply chain needs to be designed with respect to the strategy and the nature of the company's business. Across hospitals, the strategy is consistent. To put it simply, a hospital's strategy is to maximize patient care. The hospital supply chain enables this strategy by: ensuring product availability, minimizing storage space, maximizing patient care space reduce material handling time and costs for all medical staff as well as minimizing non-liquid assets(i.e. highly critical, low volume, high cost, perishable goods)(Valestin, 2001).

Hospital supply chains are complex. The hospital product line consists of high cost and low cost items as well as perishable and durable goods that are consumed in large and small volumes. In addition, there are highly critical and noncritical items. The Hospital supply chains have to be constructed such that they can handle products with all combinations of these various traits (i.e. highly critical, low volume, high cost, perishable goods)(Valestin, 2001).

2.1.10. Supply Chain Performance Measurement

Kazemkhanlou*et al* (2014) conclude in their article that performance measurement is a power tool that assists firms or organizations to evaluate resource utilization so that they can strategically manage and continuously control to achieve their objectives and goals. By selecting the right measurements the organization can check its position, that it knows where it is and where it is going; communicate its position according to two perspectives, internal, i.e. organization internally communicates in order to thank or spur individuals and teams, and external, organization externally communicates in order to cope with legal requirements or market‘s needs; confirm priorities, since by measuring it can identify how far it is from its goal;and compel progress that means it can use measurement as means of motivation and communicating priorities, and as a basis for reward.

Desirable characteristics of SCPM include inclusiveness (measurement of all pertinent aspects), universality (allow for comparison under various operating conditions) ,measurability (data required are measurable) and consistency (measures consistent with organization goals) (Kazemkhanlou*et al*, 2014) .The main goal of SCPM models and frameworks is to support management by measuring business performance as well as analyzing and improving business operational efficiency.

2.2. Empirical Literature Review

2.2.1. Pharmaceutical Supply Chain

From the perspective of specific metrics, the method which involves broad strategic aspirations and raises reflections on the performance measurement of all the processes in the supply chain is the percentage of perfect order delivery from the point of view of the final consumer. A perfect order is an order which meets all the following conditions: delivery of the right product, in the correct quantity and quality, from the correct source, to the correct destination, in perfect condition, at the agreed time and with appropriate documentation. To be able to offer a high standard in this regard, it is necessary to meet several conditions, such as for example: validity of the data in systems, availability of all ordered items, having a flexible distribution system in place, accuracy of order completion, complete documentation, orders delivered on time and in perfect condition, error-free invoices and faultless payment process (Morgan, 2004).

Perfect order fulfillment requires, therefore, coordination across multiple processes and close cooperation of all involved links. Only few supply chains can boast high achievements in this field. As Bowersox and Closs wrote in 1996, the best organizations achieved approximately 50-55 percent of the perfect order fulfillment level at that time, while for a great majority of companies this indicator stood at less than 20 percent. The study conducted by Hofman shows a positive correlation between a high level of perfect order fulfillment and the growth in sale revenue, profits and ROA (Hofman, 2004).

The Pharmaceutical Supply Chain is very complicated and greatly responsible to ensure that the appropriate drug, reaches the right people at the right time and in the right situation to fight against sickness and sufferings. This is a highly sensitive supply chain that everything less than 100 percent customer service level is unacceptable as it directly influencesthe health and safety. The solution that a lot of Pharmaceutical industries adopt is to bear a vast inventory in the supply chain to ensure close to 100 percent fill rate. However, it is a great war to ensure productavailability at an optimum cost unless supply chain processes are streamlined towards customer requirements and demands (Chandrasekaran and Kumar, 2003).

However, the perceived order fill rate the percentage of items that are filled, based on the ordered quantities with the correct products for both program (37 percent) and revolving drug fund (RDF) (14 percent) products was low. Likewise, for most products assessed, the percentage of facilities filled with the quantities ordered was about 60 percent at both the

hospital- and health center level. Note that there are many reasons why a facility may not be supplied with the quantity ordered. Shortage is one, but it is also possible that facilities were ordering more or less than the required or correct quantity (PFSA, 2015).

Supply chain delivery performance is the average percentage of orders for the supply chain members that are filled on or before the requested delivery date. In the top-performing supply chains, delivery dates are being met from 94 to 100 per cent of the time. For average firms, delivery performance is approximately 70 to 80 per cent. Updating customers on the expected delivery dates of orders is becoming a common e-service for many supply chains, (Joel *et al*, 2009). A study conducted in Ethiopia show that, regardless of the type of product, more than 80 percent of both hospitals and health centers usually receive products requested within one month or less (PFSA, 2015).

A perfect order as an evaluation method of supply chain performance should not be approached too idealistically or uncritically. Obviously, this is a reliable tool to measure the adaptation capacity of the supply chain. Unfortunately, it does not answer questions related to the performance achieved inside the chain. Yet, performance is very important because what counts is not only to what extent the customer expectations are met, but also how much it costs. The order may be fulfilled by all means but when this involves very high costs related to non-standard procedures it is no longer so desirable. Lapide argues that the fulfillment level of an efficient perfect order is a much more reliable indicator. Perfect order is not an ideal measurement tool in conducting non-standard operations that result in additional costs related, for example, to correcting errors or taking steps in order to avoid delays in order fulfillment. Through such actions, which are not reported, the true picture of the situation in the supply chain is very often blurred. Then it is impossible to make precise plans or analyze causes of problems, which in turn prevents continuous improvement Lapide, (2007).

In this context, implementation and use of an efficient perfect order seems to be an interesting solution. In addition to the analysis of meeting customer expectations, also an assessment is introduced of how often operations which do not appear in the standard process are carried out and what additional costs are thus generated. Such set of metrics and indicators analyze both the supply chain from the customer's point of view, and internal processes in cost terms.

Also other criteria are applied, by means of which performance of supply chains is evaluated from the perspective of the entire system: sale revenue of the last link of the supply chain, Inventory idle time; Customer satisfaction level; benchmarking; Cash to cash cycle. If sales at the end-customer level are visible throughout the supply chain, it is possible for each link to adapt the inventory to real needs. This reduces costs in the entire system and positively

affects the customer service level. Inventory idle time, defined as the ratio of inactive days to active days in the supply chain, is a performance evaluation indicator. The aim is to utilize the capital employed as efficiently as possible. Obviously, it is impossible to eliminate all inactive days due to inspections and buffering against fluctuations of demand, however, reduced time in which inventory is used leads to a more efficient use of resources and reduced costs (Bowersox*et al*., 1999).

Cash to cash cycle is one of the new metrics of supply chains performance. It is calculated using the following formula: quantity of inventory in days waiting period for receivables liabilities payment period. It is effective to such an extent as to allow performance measurement of multiple processes: starting from purchasing, through production, delivery and ending with management of financial flows in the organization. Importance of this aspect in international supply chains is enormous, for example due to tax issues. Coordination of financial flows is currently one of the major challenges to the management of integrated supply chains. Cash to cash cycle is perceived as a metric which determines operational and financial efficiency in companies and entire supply chains, because it provides an answer to the question of how fast the capital employed in components is converted through operations in the supply chain into cash received from the customer. Research shows that there is a tendency to reduce the cash to cash cycle in subsequent links of the supply chain, and there are significant differences between industries (Banomyong, 2005).

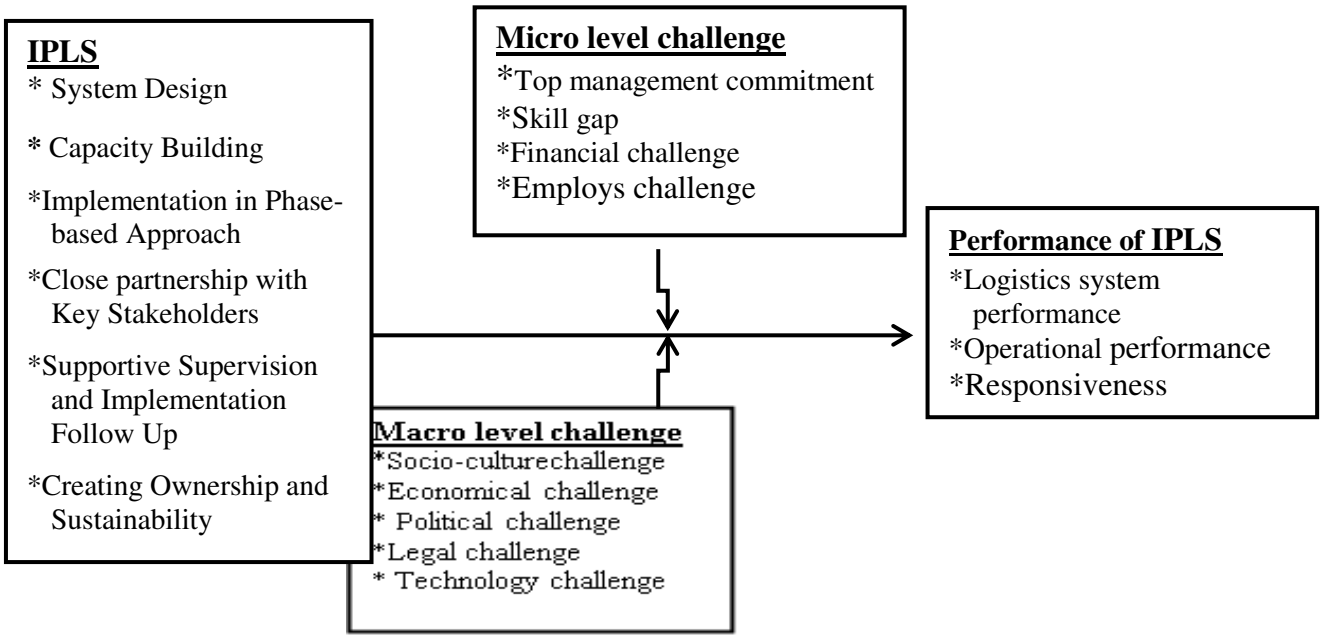
2.2.2. Performance of supply chains

In special cases, such as in sales networks, this cycle can be negative, because the companies receive immediate payment from customers, do not maintain large quantities of inventory, and their period of liabilities payment is extremely long. Recently, other criteria have been taken into account, which are used to evaluate the performance of supply chains as a whole. In this respect, such issues are pointed out as the extent of mutual trust in the relationship with cooperators, level of inventory and its rotation in the entire supply chain or the entire supply chain's ability to adapt to the changing needs of customers (Chen and Paulraj, 2004).

Until appropriate tools to measure the performance of the entire process are introduced, starting from purchasing through production, delivery, customer service, sales, and ending with finance, and many other functional areas, efforts to improve the performance of supply chains have little chance of success. It is impossible to improve supply chain performance to reach the level achieved by world business leaders, such as Wall- Mart (which was able toreduce the prices of finished products by 5-10 percent by implementing integrated measurement in the supply chain and continuous monitoring of inventory levels and

operational efficiency) or Coca Cola, HP, Siemens, Intel, and BASF, which use the SCOR model to monitor health and management of extended supply chains which they are a part of. The research conducted by the Supply Chain Council shows that the application of the SPSS 16 version model contributes to positive results, including: reduced fulfillment time of orders by 30-50 percent, increased forecast accuracy by 25-80 percent, reduced costs of supply chain management by 25-50 percent, and, as a consequence, increased value (Stephens, 2000).

2.2.3 Conceptualframework of the study



2.2.4 Identification Literature Gaps

This chapter reviews the various theories that are relevant to the study. In addition, the empirical literature brings out the fact that supply chain performance is the key, in ensuring organizational efficiency and effectiveness. A number of studies have been conducted on supply chain performance by many scholars. Many of these scholars propose the need toreview PMS and suggest SPSS model techniques for such review. However, none has been done about Logistics supply chain performance in hospitals using SPSS model. In addition, many of the studies available have been carried out in developed countries. The study available about Ethiopia was carried out on manufacturing industries.

During the article selection stage for the literature review, the search on Google Scholar of the terms medical andPharmaceutical supply chain in hospitals in Ethiopia did not deliver any relevant articles to be incorporated to the literature review. This suggests that the Pharmaceutical supply chain is being understudied. In addition, in the ministry of health website and databases there is no comprehensive study on performance of Pharmaceutical supply chain. Hence, there is need to carry out research on the supply chain performance of Pharmaceutical supply chain performance in hospital using SPSS model in the Ethiopian context.

Although SPSS model originate manufacturing industries; it also applies in the health care industries (Hubner, 2008). Despite this fact in Ethiopia hospitals supply chain particularly for Pharmaceutical supply are not measured comprehensively. Beside most studies were done to measure the perceived performance of supply chain or only focused on the theoretical application of the SPSS model. Only indicators such as availability of test, samples referred to another facility, and average turnaround time per type of test are indicated for performance measurement in Ethiopian Hospital Reform Guideline (FMOH, 2010). Therefore the researcher is interested to empirically measure the performance in more comprehensive and deeper way. This will further help the hospital administrators and other stakeholders to devise improvement strategies in order to improve their performance and take informed actions for better health care delivery.

CHAPTER THREE

METHODOLOGY OF THE STUDY

This chapter content description of the study area which expelled briefly describe the study area from your research concept perspectivestudyand the other research approach and design, population and sample design of the study which clarify the sample size determination technique and sampling technique of the study it also includesdata source and type, data collection procedure research and ethical considerations.

3.1 Description of the study area

The study was being conducted in Black Lion Referral and Teaching Hospital, Addis Ababa from December2018. Black Lion Hospital (Tikur Anbessea in Amharic) is Ethiopia's largest specialized public teaching hospital. The faculty is the oldest and the largest among the health training institutions in the country, staffed with the most senior specialists. (Black Lion Hospital Directory) The hospital provides a tertiary level referral treatment and is open 24 hours for emergency services. The hospital is administered by Addis Ababa University providing teaching for about 300 medical students and 350 Residents every year. (Black Lion Hospital Directory) Black Lion hospital offers diagnosis and treatment for approximately 370,000- 400,000 patients a year. The hospital has 800 beds, with 130 specialists, 50 non-teaching doctors. The emergency department sees around 80,000 patients a year. (2015, Black Lion Hospital Directory)

Black Lion Hospital is purposely selected because the Hospital is one of the biggest national referral and teaching hospital that provides preventive and curative services for significantly large number of patients including those referred by other health facilities. In addition, the hospital has started implementation of IPLS for drugs since 2011and currently significant number of PLWHA is getting drugs treatment.

3.2 Research design

The type of research design that was used descriptive research design whereby the overall control system and the storage system of the hospital was assessed and examined against the requirements and standards of IPLS.

3.3. Research approach

Qualitative and quantitative research approach was used to conduct this study by collecting qualitative and some quantitative data that was helping to assess the implementation of IPLS in Black Lion Hospital.

3.4 Population and Sample Design

The Black Lion Hospital overall Pharmacy section in general and all the pharmacy section professionals were taken as study population usingcensus method. The Black Lion Hospital 64 pharmacy professional, drug dispensing units and key informants such as other drugs pharmacy section head, drug store manager and dispensing unit head was taken as sample.

3.4.1 Data source and type

The sources of data were both Primary data by using Interview questions to the store keepers and group discussion with technical staffs. In addition to these primary data, secondary was also obtained through inspecting the availability of selected items' stock and IPLS formats by using SDPs' RRF, IFRR, Bin cards and store and storage space and it infrastructures. Secondary data was used to assess document review and observation of the availability of selected pharmaceuticals commodities and availability and applicability of IPLS documents such as IFRR, RRF and Bin card. Therefore, the source of data was Bin cards, IFRR, Models, receiving (GRV or GRM) and issuing (STV) invoices and RRF. The data generated from these data sources was availability of these IPLS documents, their applicability, their quality (accuracy, completeness, and timeliness).

3.5. Data collection Procedure

The data collection process, combination of different methods such as interview questions using open-ended and with guiding options; check lists with close observation; physical inventory and examining existing records (bin cards, RRF & IFRR) were used to collect data. The implementation of SCOR involves several stakeholders. The following procedure shows the data collection procedure to measure the performance of pharmaceutical logistic system using SCOR.

3.6 Ethical Considerations

Letter of support from Addis Ababa University, School of commerce was provided to the researcher to be presented to Black Lion Hospital Head (Medical Director) to obtain permission to conduct the research work. Much of themwere degree confidentiality maintained during data collection process and no name of the participating subjects (respondents) is revealed on any part of the research paper.

3.7. Method of data analysis

Data analysis was guided by considering core and important indicators that measure IPLS implementation. The collected data was checked initially to detect for any errors to ensure consistency and completeness. After the data is checked it was coded, entered and analyzed by the use of Statistical Package for the Social Sciences (SPSS) version 20. Study results was analyzed have presented by using descriptive statistics (mean, standard deviation, proportion, and percentage).

3.7.1 Validity and Reliability test

Reliability test

Reliability is the level at which an assessment tool can produce the same result consistently (Mora, 2011). The SPSS is a standard model that could be comparable across companies or settings. The tool is developed based on the metrics selected from SPSSguide. Orientation was given on the tool for easy understanding. The result was taken as if it is up to 70 percent and above. Consult Garson,(2006) the cronbalh α(alpha) value for Reliability test.

Table 3.1:- Statistical Package for Social Sciences (SPSS version 20) overall result is presentedin the

Reliability Statistics			
	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Overall Reliability	0.875	.869	46
Role of IPLS		.859	20
Challenge for preference IPLS in the hospital		.855	13
Factors hindering IPLS Implementation system		.675	13

Validity test

Greene *et al* (2011) describe validity as the extent to which data measures the intended purpose. In this research to improve validity, the SPSS guide were used to develop the tool, which is reference tool accepted by supply chain council. In addition,experts in the field of logistic supply chain management study team were selected purposively to validatethe instruments and their comments were incorporated in the final version of the questioner.

In addition, even though the key respondents described the above challenges of IPLS implementation, they all agreed that IPLS is preferred to the vertical/kit system due to reasons/advantages they mentioned such as, if properly implemented IPLS is useful to prevent over stock, under stock, stock outs and wastage of pharmaceuticals due to damage, loss and expiry and ultimately help patients get the right drug, at the right time, in the right quantity and in the right condition. In addition, they emphasized the advantage of implementing IPLS stating that if properly implemented, IPLS provides real time data for accurate reporting and recording of pharmaceutical items storage and distribution.

Proper implementation of IPLS demands use of various recording and reporting formats and tools that should consistently and properly be used at different levels of the pharmaceutical supply chain system of Ethiopia. Standardized recording and reporting formats and tools consistent availability and proper usage constitutes critical supply chain indicators.

In collaboration of its partners, the hospital introduced by printing and distributing these important recoding and reporting tools to health facilities like PFSA. These tools and formats include Bin cards, Stock cards, Internal Facility Report and Resupply Form (IFRR) and also Health Post Monthly Report and Resupply Form (HPMRR).(PFSA, 2014), Some formats are included in the appendices.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

This chapter presents study results objective wise along with discussion of the result. These results and discussions were further substantiated with previous findings of the scholars in the area.

4.1. Profile of the Respondents

In this section demographic information of the respondents is described using frequency distribution as presented in the table 4.1.

Table 4.1: Demographic Profile of the Respondents

Work experience	Frequency	Percent
1-5 years	17	26.6
5-10 year's	43	67.2
above 10 years	4	6.3
Total	64	100.0

Educational level	Frequency	Percent
College diploma	3	4.7
B.Sc. degree	56	87.5
Masters and above	5	7.8
Total	64	100.0

4.2. The roles of IPLS implementation on the supply chain performance of Black Lion Hospital.

The main role of IPLS in the Hospital is very high but only few partsof the system is being used in thepharmacy, there are 16 pharmacies in the hospital, so as per the interview with the facility pharmacy and observation during the day of visit by the principal investigator, this assessment shows that all the required logistics recording and reporting tools some of them are being annexes such as bin cards, Stock Cards, RRF Formats, IFRR formats and IPLS SoP Manuals are available in the hospital. Beside the interview the following questionnaire were given to the staff of the Hospital and their response is presented in **table 4.2.1.**

Table 4.2.1:- The role of IPLS for Implementation in the Black Lion Hospital.

Role of IPLS ***N=64***	Mean	Std. Deviation
A. Warehousing practices		
Storing products according to recommended storage guidelines is practiced using IPLS	2.14	1.11
Storage space optimization is being practiced using IPLS	2.22	1.22
Accurate identification of all storage locations is practiced using IPLS	2.41	1.36
Waist-level handling and lifting aids usage is practiced using IPLS	2.36	1.44
Making the records and reports of warehouse up to date is practiced using IPLS	2.00	1.06
Grand mean	**2.22**	
Role of IPLS ***N=64***	**Mean**	**Std. Deviation**
B. Transportation		
Collaborative relationships with transport companies is practiced using IPLS	2.89	1.129
Strategic use of third-party transport logistics providers is practiced using IPLS	2.62	1.202
Measuring the transport performance is practiced using IPLS	2.86	1.332
Grand mean	***2.79***	
Role of IPLS ***N=64***	**Mean**	**Std. Deviation**
C. Purchase practices		
Effective implementation of purchase order processing is practiced using IPLS	2.27	1.483
Effective communications with suppliers on research activities and new product development is practice using IPLS	2.89	1.404
Transparent information sharing about each other's inventory status with suppliers is practiced using IPLS	2.50	1.533
procurement limit to the essential drugs list is practiced using IPLS	2.69	1.446
Grand mean	**2.58**	
Role of IPLS *N=64*	**Mean**	**Std. Deviation**

D. Inventory management practices		
Correct identification of all materials in the stock /availing nice inventory information is practiced using IPLS	2.36	1.361
Replenishment planning and inventory deployment is practiced using IPLS	2.50	1.447
Having a system for wastage free utilization of available materials inventory is practiced using IPLS	2.58	1.531
Ensuring the stock levels within the established maximum stock levels and emergency order point/ optimal inventory positioning is practiced using IPLS	2.53	1.553
Grand mean	**2.49**	
Role of IPLS *N=64*	**Mean**	**Std. Deviation**
E. Production (customer)practices		
Responding quickly to the customer's needs is practiced using IPLS	2.91	1.342
Fulfilling customer orders in the promised date is practiced using IPLS	3.09	1.377
Measuring and evaluating customer satisfaction level is practiced using IPLS	3.34	1.596
Creating long-term relationships with your customers is practiced using IPLS	3.08	1.636
Grand mean	**3.10**	

A. IPLS for Implementation in the Black Lion Hospital Warehouse management

The above result shows the weak practices of the warehouse as shown in the table above, respondents stated the practice of Storing products at warehouse according to recommended storage guidelines is practiced using IPLS, (Mean=2.145) of the respondents rated the practice, Storage space optimization is being practiced using IPLS is also rated (Mean=2.22) by respondents, storage locations is practiced using IPLS (Mean=2.4) respondents rated the practice in Black Lion Hospital, Waist-level handling and lifting aids usage practiced using IPLS(Mean=2.36) respondents rated the practice is being used, Making the records and reports of warehouse up to date is practiced using IPLS, (Mean=2.00) respondents rated the practice is being used in the Black Lion Hospital, Accurate identification of all this result shows the Black Lion Hospital overall warehouse practice is very weak.

As the literature review a say a crucial component of Pharmaceuticals Supply Chain activities is the efficient and effective warehousing and distribution System. The Ethiopian pharmaceutical supply chain has several problems including non-availability, affordability, poor storage, lack of stock management and weak distribution system including weak fleet management. Health Facilities have problems to get right products; right quantity and right quality are not available at the right time, right place, for the right cost due to poor distribution system (PFSA, 2105) The Reliability attribute addresses the ability to perform tasks as expected.

B. IPLS for Implementation in the Black Lion Hospital Transportationmanagement

According to Shewarega *et al*, (2015), in the Ethiopian supply chain, commodities are delivered to facilities using a combination of mechanisms. Since March 2012, PFSA has directly delivered program commodities to many health facilities all hospitals and accessible health centers. For RDF products, health facilities are expected to use their own vehicle, or other transportation, to collect their purchased products from higher levels or vendors. Health posts are expected to collect their products from their resupply health center every month.

The above detail shows the weak practices of the transportationas shown in the table above, respondent stated the practice Transportation of Collaborative relationships with transport companies is practiced using IPLS, (Mean=2.89) of the respondents rated the practice, Strategic use of third-party transport logistics providers is practiced using IPLS is also rated(Mean=2.62) respondents of Black Lion Hospital, Measuring the transport performance is practiced using IPLS, (Mean=2.86) respondents rated the practice in Black Lion Hospital, respondents rated the practice is being used in the Black Lion Hospital, According to this result is mines that the overall warehouse practice in the Hospital is very weak. But in the interview question they have told me that more of the transportation of the goods is being transported by the government office which is called pharmaceuticals fund and supply agency (PFSA).

According to the literature review a say Health and Education advice and resource team study (2016)States Some African Countries (Kenya,Zambia, Uganda, Mozambique, Sierra Leone, Tanzania and Ethiopia) Have National pharmaceuticals procurement and Supply institutions. Howeverthese institutions have problems including; longer tier system, Weak information flows along thetiers, weak measurement of Supply chain performances, Transportation problem and weaksupply chain leadership.

Assessment result from the interviews conducted with key respondents such as the Store Manager, The Dispensary Unit Head and Head of Pharmacy Unit Directorate shows that the

major challenges of IPLS implementation in the Hospital includes, poor commitment of staff, Stock outs and Shortage of items at the higher supplying unit (PFSA hub) , delivery(distribution) of items with near expiry date by the higher supplying unit (PFSA hub), poor data quality on documentation and reporting, execs work load and severe shortage of manpower, poor follow up and support by top management, absence of performance measurement practice of pharmacy staffs with respect to their IPLS responsibility, huge paper work involved in IPLS, lack of data clerk in the pharmacy store and lack of incentives for store managers who are laboring too much on store management activity, insufficient space of pharmaceutical storage and inadequate vehicles for transportation of items to and from the facility.

C. Role of IPLS for Implementation in the Black Lion Hospital purchase practices.

The finding indicated that the emphasis given for the purchase of the right quality raw materials is lower as compared to price of the raw materials by these firms. This shows also that are most of the firms are price sensitive.

The Agency manages both Program (donated and free) and revolving drug fund (purchased)Pharmaceuticals. Distribution of pharmaceuticals is mainlyperformed by Storage and distributiondirectorate and general service unit. Currently the Central PFSA has and different functional vans and heavy load Vehicles to distribute pharmaceuticals (PFSA, 2016).

The above detail shows the weak practices of the purchase practices as shown in the table above, respondent stated the purchase practices of Effective implementation of purchase order processing is practiced using IPLS (Mean=2.27) of the respondents rated the as being practice, Effective communications with suppliers on research activities and new product development is practice using IPLS is also (Mean=2.89) respondents rated the as being practice, Transparent information sharing about each other's inventory status with suppliers is practiced using IPLS (Mean= 2.5) of the respondents rated the as being practice, procurement limit to the essential drugs list is practiced using IPLS (Mean=2.69) respondents rated the as being used in the Black Lion Hospital, Accurate identification of all this result is show the Black Lion Hospital that the overall warehouse practice in the Hospital is very weak.

According to the literature review a say that, Frazelle (2002) the logistics of customer response includes the practices of developing and maintaining a customer service policy, monitoring customer satisfaction, orders entry (OE), order processing (OP), and invoicing

and collections. Ronald (1997) argues that customers have been increasingly sensitized to expect quick response to their demands. He pointed out that rather than consumers having to accept the "one size fits all" philosophy in their purchases, suppliers are increasingly offering products that meet individual customer needs. This showed that the level of customer satisfaction shall be measured to make the required corrective action. Similarly, Frazelle (2002) argues that in today's just-in-time world the ability to respond to customers' requirements in ever-shorter time-frames has become critical. Most authors and practitioners agree that building and enhancing long-term relationships with customers generates positive returns to firms (Reichheld, 1993, 1996 as cited in Jones, Fox and Fabrigar, 2010).

D. IPLS for Implementation in inventory management practices.

Proper implementation of IPLS demands use of various recording and reporting formats and tools that should consistently and properly used at different levels of the pharmaceutical supply chain system of Ethiopia.Standardized recording and reporting formats and tools consistent availability and proper usage constitutes critical supply chain indicators.

In collaboration of its partners, PFSA introduced by printing and distributing these important recoding and reporting tools to health facilities like Black Lion Hospital. These tools and formats include Bin cards, Stock cards, Internal Facility Report and Resupply Form (IFRR) and also Health Post Monthly Report and Resupply Form (HPMRR), (PFSA, 2014).

The above shows the weak practices of the purchase practices as shown in the table above, respondent stated the purchase practices of Effective implementation of purchase order processing is practiced using IPLS (Mean=2.36) of the respondents rated the as being practice, Replenishment planning and inventory deployment is practiced using IPLS is also (Mean=2.5) respondents rated the as being practice, Having a system for wastage free utilization of available materials inventory is practiced using IPLS (Mean=2.58) of the respondents rated the as being practice, Ensuring the stock levels within the established maximum stock levels and emergency order point/ optimal inventory positioning is practiced using IPLS (Mean=2.53) respondents rated the as being used in the Black Lion Hospital, Accurate identification of all this result is show the Black Lion Hospital that the overall warehouse practice in the Hospital is very weak.According to the literature review a say inventory management is as important as like as that of managing the money at the bank (Mark and Mike, 2015). After an item is ordered and received, it must be properly stored until thecustomer needs it. A country's inventory control strategy specifies how much stock to store andwhere to store it. Enough stock should be available to meet customer needs until a

new order isreceived; but not so much that stocks expire or are wasted or that you exceed storage capacity.Storage has two purposes for products: (1) to ensure the quality or condition, and (2) to make themavailable for distribution (Desalegn, 2015).

E. Role of IPLS for Implementation Production (customer) practices.

Serving Customers is the end result of all activities in the logistics cycle. We do all of our work in logistics in order to serve the customer. In any health logistics system, health programs must select products. In a health logistics system, a national formulary and therapeutics committee, pharmaceutical board, board of physicians, or other government-appointed group may be responsible for product selection. Another activity in the logistics cycle is quantification which is the process of estimating the quantity and cost of the products required for a specific health program (or service), and, to ensure an uninterrupted supply for the program, determining when the products should be procured and distributed. After a supply plan has been developed as part of the quantification process, quantities of products must be procured.

The above shows the Neutral practices of the Production (customer) practices as shown in the table above, respondent stated the Production (customer) practices of Responding quickly to the customer's needs is practiced using IPLS (Mean=2.91) of the respondents rated the as being practice, Fulfilling customer orders in the promised date is practiced using IPLS is also (Mean=3.09) respondents rated the as being practice, Measuring and evaluating customer satisfaction level is practiced using IPLS (Mean=3.34) of the respondents rated the as being practice, Creating long-term relationships with your customers is practiced using IPLS (Mean=3.08) respondents rated the as being used in the Black Lion Hospital, Accurate identification of all this result is show the Black Lion Hospital that the overall Production (customer) practices in the Hospital is Neutral. According to the literature review a say the part of supply chain management that plans, implements, and controls the efficient, effective forward and reverses flow and storage of Pharmaceuticals, services and related information between the point of origin and the point of consumption in order to meet customers' requirement. Logistics management is an integrating function, which coordinates and optimizes all logistics activities, as well as integrates logistics activities with other functions including marketing,sales manufacturing, finance, and information technology'' (USAID | DELIVER, 2011).

Table 4.2.2 overall summary of roles of IPLS implementation on the supply chain of Black Lion Hospital

The roles of IPLS implementation on the supply chain of Black Lion Hospital				
	Minimum	Maximum	Mean	Std. Deviation
Warehouse Practice	1.00	4.40	2.22	.846
Transportation	1.00	5.00	2.79	.911
Purchasing Practices	1.00	5.00	2.58	1.121
Inventory Management Practice	1.00	5.00	2.49	1.243
Production (customer) practice	1.00	5.00	3.10	1.069
Grand Mean	**2.64**			

The above table shows the overall result of IPLSimplementation on the supply chain of Black Lion Hospital,during my interview question the practice of production(customer)is very weak, and they use to collect customer response time to time butthey failed to do so because as we know the Black Lion Hospital is most busy Hospital in the country. Regarding warehouse practice, products are released based on presentation of IFRR statement however since there is lack of adequate awareness of the system which generates IFRR statement the situation created a huge gap on using the time efficiently simultaneously that goes to inventory management practice. Considering transportation and purchasing practice the whole procedure and practice is directed by PFSA so the efficiency relay on the effectiveness of the agency primarily depending on the reporting of the hospital.

Supply chain integration is a performance-improving approach that develops seamless linkages between the actors, health facility levels, and functions within a supply chain to optimize customer service. It is the effective and efficient road to maximizing customer service index. The objectives of supply chain integration are to improve efficiency and reduce redundancy while also enhancing product availability. Supply chain integration strives to better connect demand with supply, which can both enhance customer service and lower costs. Well-functioning (integrated) supply chains are characterized by clarity of roles and responsibilities, agility, streamlined processes, visibility of information, trust and collaboration, and alignment of objectives (USAID/DELIVER PROJECT, 2011).

Information and reliable data is necessary to measure performance and determine Key Performance Indicators. Therefore, some countries use site visits or meetings. However, only a few countries have defined indicators and performance measurements. Distribution

indicators should monitor frequency, reliability and condition of transport vehicles (USAID, 2011c).

4.3.IPLS Implementation and its Role to improve the organizational performance of Black Lion Hospital.

Assessment on IPLS contribution to improvement of organizational performance, the key respondents described advantages of IPLS implementation, they all agreed that IPLS is preferred to the vertical/kit system due to reasons/advantages they mentioned such as, if properly implemented IPLS is useful to prevent over stock, under stock, stock outs and wastage of pharmaceuticals due to damage, loss and expiry and ultimately help patients get the right drug, at the right time, in the right quantity and in the right condition. In addition, they emphasized the advantage of implementing IPLS stating that if properly implemented, IPLS provides real time data for accurate reporting and recording of pharmaceutical items storage and distribution.

According to the study by the World Bank (2002) the major logistics constraints in the manufacturing industries faces are its dependence on imported inputs, its difficulty in establishing direct relationship with buyers, taxes and the restrictions placed on foreign owned companies. Related to this, insufficient container handling capacity, insufficient road development and maintenance, underused railways capacity, insufficient management, insufficient airfreight facility are the major problems in logistics infrastructures (The World Bank, 2002).

Table 4.3.1 IPLSImplementation and its Role to improve the organizational performance of Black Lion Hospital

N=64	Mean	Std. Deviation
IPLS Implementation system regarding Cost		
IPLS Implementation reduces the cost of the hospital	2.89	1.393
IPLS Implementation system reduces the cost of the warehouse for the hospital.	2.78	1.485
IPLS Implementation cost is reduces the cost of the Transpiration for the hospital.	3.11	1.492
GrandMean	***2.927***	
N=64	Mean	Std. Deviation
IPLS Implementation system regarding time		
IPLS Implementation reduces response time compared to manual to system.	2.59	1.377

IPLS Implementation reduces the warehouse response.	2.53	1.345
IPLS Implementation reduces transportation responds.	3.03	1.480
GrandMean	***2.717***	
N=64	Mean	Std. Deviation
IPLS Implementation system regarding flexibility		
IPLS Implementation is easy system for operation	2.58	1.467
IPLS Implementation is easy system reduce warehouse controlling system	2.78	1.362
IPLS Implementation is easy system reduce transportation controlling system	3.17	1.486
IPLS Implementation has made the hospital controlling system easy	2.88	1.609
IPLS Implementation is easy system reduce inventory controlling system	2.78	1.464
IPLS Implementation improves the flexibility of rendering the service	2.77	1.520
IPLS Implementation increase reliability of the hospital's service.	2.92	1.473
GrandMean	***2.84***	

4.3.1. IPLS Implementation system from the perspective Cost

Allocation and management of finances directly affect all parts of the pharmaceutical logistics Cycle, including the quantities of products that can be procured, the amount of storage space that may be available, the number of vehicles that can be maintained, and the number of staff working in logistics. Mobilizing resources and securing a budget line item for health commodities and logistics activities is extremely important to ensure that products are available and that the logistics system operates effectively. To determine the resources needed to scale up, supply chain managers first need to assess what the expected costs are at different levels of the logistics system. When determining supply chains costs, managers should consider the cost of storage, transportation, and management; and determine what share of these costs each group will cover (i.e., Ministry of Health, donors, nongovernmental organizations (USAID | DELIVER, 2011).

The above shows the weak practices of the IPLS Implementation system and Cost as shown in the table above, respondent stated the IPLS Implementation system and Cost of IPLS Implementation reduces the cost of the hospital(Mean= 2.89) of the respondents rated the as system being practice, IPLS Implementation system reduces the cost of the warehouse for the

hospital is also (Mean=2.78) respondents rated the as system being practice, IPLS Implementation cost is reduces the cost of the Transpiration for the hospital.(Mean=3.11) of the respondents rated the as system being practice, the as being used in the Black Lion Hospital, Accurate identification of all this result is show the Black Lion Hospital that the overall Production (customer) practices in the Hospital is weak. According to the literature review a say it aims to ensure thatpatients always get pharmaceuticals they need. To be successful, the system must fulfill the sixrights of supply chain management by ensuring the right products, in the right quantity, of theright quality, at the right place, at the right time and for the right cost (PFSA, 2015).

4.3.2IPLS Implementation from the perspectiveof time.

In this study, in addition to checking timely update of bin cards, the quality of updated data on bin card was cross-checked by comparing the accuracy of bin card balance with the physical count for all the drugs available in the Hospital store. The comparison was done at two levels of accuracy in such a way that a bin card balance with perfect accuracy (no discrepancy) with the physical count is considered accurate while a bin card having a less than 10 percent discrepancy in value between the bin card balance and the physical count is considered near to accurate.

The above shows the weak practices of the IPLS Implementation system and time as shown in the table above, respondent stated the IPLS Implementation system and time of IPLS Implementation reduces response time compared to manual to system.(Mean=2.59) of the respondents rated the system help them to use time more, IPLS Implementation reduces the warehouse response is also (Mean=2.53) respondents rated the system help them to use time more, IPLS Implementation reduces transportation responds(Mean=3.003) of the respondents rated the system help them to use time more of the Black Lion Hospital, Accurate identification of all this result is show the Black Lion Hospital that the overall IPLS Implementation system and time in the Hospital is weak.According to the literature review a sayproviding complete and acceptable health care services requires availability of safe, effective and acceptable drugs and pharmaceutical items with the right quality, right quantity and for the right patient/client at all times. In spite of this requirement, various supply chain management gaps such as stock non availability, stock shortage, poor storage and poor stock management system, unaffordability and irrational drug use had been observed, in previous times, in the Ethiopian Pharmaceutical Supply Chain Management System. (PFSA IPLS

SOP, 2015) and Facility Report and Resupply Forms (IFRR), and Report and Requisition Forms (RRF) should always be available as blank forms in the facility for use, and should also be used timely and accurately to record and report quality IPLS data. Proper, timely and accurate use of IPLS tools helps to have a good quality, timely and well organized IPLS data that would help to make logistic management decisions at higher level like PFSA for timely resupply and appropriate refill of pharmaceuticals when requested by lower level facilities like Hospitals (USAID | DELIVER, 2011).

4.3.3.IPLS Implementation forms the perspective of flexibility.

Since each department achieve their goal with the supplied material, the delaines of supplying the material makes them not to achieve as per their own time plan. Primarily, the public are not getting the authority's service on time. This might be a big challenge for the authority which needs immediate solution.

The above shows the weak practices of the IPLS Implementation system and flexibility as shown in the table above, respondent stated the IPLS Implementation system and flexibility of IPLS Implementation is easy system for operation(Mean=2.58) of the respondents rated the system help them to use more flexible, IPLS Implementation is easy system reduce warehouse controlling system(Mean=2.78) respondents rated the system help them to use more flexible, IPLS Implementation is easy system reduce transportation controlling system(Mean=3.17) of the respondents rated the system help them to use more flexible, IPLS Implementation has made the hospital controlling system easy(Mean=2.88) respondents rated the system help them to use more flexible, IPLS Implementation is easy system reduce inventory controlling system (Mean=2.78)respondents rated the system help them to use more flexible, IPLS Implementation improves the flexibility of rendering the service IPLS Implementation improves the flexibility of rendering the service (Mean=2.77)respondents rated the system help them to use more flexible, IPLS Implementation increase reliability of the hospital's service (Mean=2.92) respondents rated the system help them to use more flexible, Black Lion Hospital, Accurate identification of all this result is show the Black Lion Hospital that the overall IPLS Implementation system and flexibility in the Hospital is weak.

Table 4.3.2.overall summary of IPLS Implementation and improve the Performance of Black Lion Hospital.

	Minimum	Maximum	Mean	Std. Deviation
IPLS Implementation system Cost	1.00	5.00	2.9271	1.21058
IPLS Implementation system time	1.00	5.00	2.7188	1.09225
IPLS Implementation system flexibility	1.00	5.00	2.8393	.95459
Grand Mean	**2.82**			

The above table showsIPLS Implementation and its role to improve the Performance of Black Lion Hospital, thus during the conducted interview the respondents confirmed that the Supervision enables improvements of staff and system performance and further helps to identify potential gaps at the facility level which includes stock outs, overstocks, under stocks, drug expiry etc. there by alerting managers and decision makers to take some proactive prevention methods.Considering the cost and flexibility during the implementation there is no significant change however, regarding time it has slight change in reducing the applicable time.

Stock availability is the most important outcome of a successful logistic system. If a successful logistic system is in place, pharmaceutical stocks will be available for use at the right time and quantity so that an improved health outcome can be achieved which is the ultimate goals of any successful health logistic system. On the contrary, stocks outs in any health logistics system implies critical system failure which result in failure of addressing the treatment needs of patients there by causing reduced reliance on the health system by the society.

4.4.Factors hindering (challenge) the IPLS Implementation in the Black Lion Hospital

As per the result obtained from the interview with key Hospital informants, the study showed that the major challenges related to IPLS implementation at the Hospital level can be categorized in to Human resource related factors (poor commitment of staff, execs work load and severe shortage of manpower, lack of data clerk in the pharmacy store); Management related factors (absence of performance measurement practice, lack of incentives for staffs); Supply problem related factors (Stock outs, shortage of items and supplying items with short shelf life by the higher supplying unit (PFSA hub); LMIS related factors (huge paper work involved in IPLS, and, poor data quality on documentation and reporting); Infrastructure related factors(insufficient space of pharmaceutical storage and inadequate vehicles for transportation of items to and from the facility).

Different studiesshowed that some of the factors mentioned above can have negative impact on the overall productivity of staffs hence on poor implementation of the system they use to produce successful result. For example in two different studies conducted by the Global Pharmacy Workforce 2008 and by WHO in 2010, showed that factors such as shortage of man power, lack of proper training, lack of top management commitment in supervision and follow up are some of the significant factors that could cause staff dissatisfaction, high turnover and poor performance in their assignment. (Dick M, Farai C., 2011, WHO, 2010).

4.4.1Factors hindering IPLS Implementation system by macro level factors.

Factors like political influence, fairness in awarding procurement contracts, adherence in procedures, bureaucracy and corruption affect the efficiency of the public procurement function at the public institution in Kenya. From the findings the study concludes that staff competencies affect greatly the efficiency of procurement function. Hence, employees need to acquire core competencies like knowledge, skills, experience and abilities to enhance public procurement function efficiency in public institutions. The study also concluded that supplies Branch did not embrace modern technology in the procurement function.

Table: - 4.4.1 Factors hindering IPLS Implementation system in Black Lion Hospital.

Factors hindering IPLS Implementation system	**Mean**	**Std. Deviation**
Political Factor		
The existing government regulation and law hindering the implementation of IPLS	1.20	.858
The existing e documented policy or guiding for drug selection hindering the implementation of IPLS	1.28	.917
Political Factor Grandmean =	***1.24***	
Technological Factor	**Mean**	**Std. Deviation**
Lack of awareness on how to use IPLS hinders the implementation of the system	4.59	1.15
Resistance to change by employees hinders IPLS implementation system	4.25	1.46
Lack of appropriate performance matrix hinders IPLS implementation system	4.47	1.28
ICT Infrastructure hinders IPLS implementation	4.17	1.28
Technological FactorGrandmean =	***4.28***	
Economical Factor	**Mean**	**Std. Deviation**
Financial constraint in the hospital hinders the Implantation of IPLS	4.48	1.51

The overall inflation of the economy hinders IPLS implementation	4.11	1.26
Unavailability of finance to support the system hinders IPLS Implementation system	4.45	1.58
Economical FactorGrandmean =	***4.3***	
Organizational Internal factor	Mean	Std. Deviation
People altitude towards the system of IPLS hinders the implementation	4.09	1.591
Lack of training IPLS hinders its implementation	4.70	1.034
Lack of top management commitment hinders IPLS implementation	4.52	1.297
Employee skill hinders the IPLS implementation	4.59	1.191
Organizational Internal factorGrandmean =	***4.475***	

4.4.2. Political Factor

The above show the weak practices of the Political Factor and the system as shown in the table above, respondent stated the existing government regulation and law hindering the implementation of IPLS(mean= 1.2) of the respondents rated the system is being challenged by Political Factor, The existing e documented policy or guiding for drug selection hindering the implementation of IPLS(mean=1.28) of the respondents rated the system is being challenged by Political Factor of the Black Lion Hospital, Accurate identification of all this result is show the Black Lion Hospital that the overall IPLS Implementation system and time in the Hospital is very weak because the system is not more concocted to the government policy.

4.4.3. Technological Factor

The above table shows that, somehow being technology help to practices of the technological Factor and the system as shown in the table 4.4.1 above respondent stated the lack of awareness on how to use IPLS hinders the implementation of the system,(mean= 4.45) of the respondents rated the system is being challenged by technological factor, resistance to change by employees hinders IPLS implementation system(mean= 4.17) of the respondents rated the system is being challenged by technological factor, lack of appropriate performance matrix hinders IPLS implementation system (mean= 4.39) of the respondents rated the system is being challenged by technological factor, ICT infrastructure hinders IPLS implementation (mean= 4.11) of the respondents rated the system is being challenged by technological factorof the Black Lion Hospital, Accurate identification of all this result is show the Black

Lion Hospital that the overall IPLS Implementation system and technology in the Hospital is technology help to practices of the system.

The technology should create measureable results (linked to Return on Investment) including, reduced transaction costs, improved process efficiency, increased contract compliance, improved transparency, reduced cycle times and improved inventory costs. Technology can also increase supplier access to bid opportunities which can result in increased competition, diversity and inclusion of suppliers. Moreover, according to the research conducted by Hagen, &Zeed it is concluded that government officials have increasingly come to realize that public agencies must utilize ICT in order to enhance the procurement processes in the public sector. Faced with tight budgets and a retiring workforce, today's government agencies are operating in an environment defined by the need to 'do more with less'. Public authorities are expected to provide excellent service to their constituents in an effective and transparent manner, all the while working under constant resource constraints by adopting ICT (Hagen and Zeed, 2005). In addition, majority of the respondents believed that technology highly affects the procurement process and this finding is in agreement with those of Rankin *et al*., (2006) who indicated that usage of ICT in procurement process would influence the good procurement practices.

4.4.3 Economical factor

The above shows the weak practices of the economical factor and the system as shown in the table above, respondent stated the lack of awareness on how to use IPLS financial constraint in the hospital hinders the Implantation ofIPLS(mean= 4.45) of the respondents rated the system is being challenged by economical factor, The overall inflation of the economy hinders IPLS implementation(mean= 4.03)of the respondents rated the system is being challenged by economical Factor, Unavailability of finance to support the system hinders IPLS Implementation system (mean= 4.42) of the respondents rated the system is being challenged by economical factorof the Black Lion Hospital, Accurate identification of all this result is show the Black Lion Hospital that the overall IPLS implementation system and time in the Hospital is not very much infected by economical factor.

The above shows the weak practices of the organization internal factor and the system as shown in the table above, respondent stated the People altitude towards the system of IPLS hinders the implementation(mean=4.09) of the respondents rated the system is being challenged by Internal factor, Lack of training IPLS hinders its implementation(mean= 4.7)of

the respondents rated the system is being challenged by Internal factor, Lack of top management commitment hinders IPLS implementation,(mean=4.52) of the respondents rated the system is being challenged by Internal factor, Employee skill hinders the IPLS implementation (mean= 4.59) of the respondents rated the system is being challenged by Internal factor of the Black Lion Hospital, Accurate identification of all this result shows the Black Lion Hospital overall IPLS Implementation system and time in the Hospital is not that much infected by Organizational Internal factor.

Table: - 4.4.2overall summary of macro level Factors hindering IPLS Implementation system

Factors hindering (challenge) the IPLS Implementation in the Black Lion Hospital.				
	Minimum	Maximum	Mean	Std. Deviation
Political Factor	1.00	4.50	1.2422	.67842
Technological Factor	2.00	5.00	4.2813	.83512
Economical Factor	2.33	5.00	4.3021	.92338
Organizational Internal factor	2.00	5.00	4.4766	.84011
Grandmean	**3.57**			

The results of this study have some managerial implication for PFSA and FMOH at large and to procurement office in particular. The study has found the entire five variables were the most important factors influencing good procurement activities in the agency. Thus, managers at different level need to work on these factors to mitigate their effect and eventually to improve work performance of the procurement unit. Then other factors need to be tackled once the five main factors given due attention at firsthand.During my interview I have come to understand that politically and economically there is no adverse effect on the implementation of IPLS, however considering technology a greater impact is found because the system requires computer, data server and program system to assist the finalization so since there is lack of adequate technology in the hospital it is considered as a hindrance. Organizational internal factor is also a factor hindering the IPLS implementation because since the hospital lacks awareness and consecutive staff training and development.

CHAPTER FIVE

Summary, Conclusions and Recommendations

This chapter presents study Summary of major findings,Conclusions,Recommendations and Future Research Recommendation.

5.1 Summary of Major Findings

The study is summarized by that Collaborative relationship with transport companies while using IPLS is the first important factor that influence good pharmaceutical procurement practices in the hospital. ICT usage is the second important factor that influence good pharmaceuticals procurement practices in the hospital. Training is the third important factor that influence pharmaceutical procurement practices in the hospital. Record management is the fourth important factor that influences good pharmaceutical procurement practices in the hospital. The study identified that majority of the respondents believed that IT is a very important component to facilitate procurement process. Less overall support from top managements

Resistance to change by employees hinders IPLS implementation system a key role in the operations of hospital management. The main purpose of the study was to assess factors Integrated Pharmaceutical Logistic System Implementation and its role on the Performance of Black Lion Hospital. The study was conducted through descriptive design with population of 64 respondents at hospital who are pharmacy professionalbut there are 25 studentsofpharmacy which is not included in the process.

There are four factors hindering IPLS Implementation system variables, Political factor (Mean= 1.24), technological factor (Mean= 4.28), economical factor (Mean= 4.3), and organizational internal factor (Mean= 4.475) were factors hindering IPLS Implementation system in hospital. The most important factors ranked by respondents were organizational internal factor, technological factor, economical factor followed by Political factor.

The study also found out that, the system function was not well managed and all selected variables significantly influence the system practices. Record management was also found to be not well managed and also the majority of staffs believed there is no regular training schedule.

In terms of the assessment on the IPLS system there are different factors, in most of the departments the factors were used in stages of the procurement process however; the technical experts should be well-trained on IT. Uses of ICT significantly influence the good procurement practice in the agency.

5.2 CONCLUSIONS

This research objective regarding the role of Integrated Pharmaceutical Logistic System Implementation and its Performance of Black Lion Hospital,is done at 64 pharmacy professionals was targeted to gather information related with store keepers' demographic characteristic such as age, sex, experience, profession and qualification, IPLS training status.

The result clearly shows that, IPLS implementation in the Hospital is encouraging with respect to some measurements such as availability of logistics reporting and recording tools and stock keeping logistic formats, providing supervision and training, availability of drugs and some measurements of logistic system performance such as having an acceptable resupply period and less frequent emergency order trend.

Then it is known that Logistic reports move data up and down through the supply chain and help in decision-making. To facilitate correct and consistent reporting and resupply within the facility and among the different levels in the health supply chain, IPLS introduced the IFRR, HPMRR, and RRF. Hospitals and health centers use the RRF to report their consumption and to request the resupply quantity every two months.

The study also found out that, technological factor, economical factor, organizational internal factor and procurement functions are was not well managed and all selected variables highly and significantly influence the IPLS Implementation system. Favoritism, tribalism, politics prevalence were very low and did not significantly influence the system in the hospital, record management was also found to be not well managed and also the majority of staffs believes there is no regular training schedule due to none availability of computers, however; the technical experts should be well trained on IT. Uses of ICT significantly influence the system in the Hospital.

5.3 Recommendations

Based on the findings, the following recommendations are forwarded by the study

- Continuous efforts such as providing on job training, regular supervision, regular and timely monitoring and feedback on RRF reports should be done to maximize proper utilization of system tools and bring improved the system data quality.
- Regarding employee qualification and competency, the result of the study showed that there is a shortage of qualified and experienced employee with a background of system.
- The top management should support employees to have career aspiration on system and develop retention mechanism of existing qualified employees or attract qualified employees from outside. Moreover they should focus on fulfilling the required materials and technology for effective implementation.
- All the employees involved in system process should advance their level of education especially on overall system process to minim lack of awareness on how to use IPLS hinders the implementation of the system.
- Should encourage further studies to be conducted in the area specifically on the causes and consequences of the system inefficiencies of the process.
- According to the interview the monthly reports are sent to the warehouse manager by hired cop like that of the document which is annex, the hospital should be transferred easily through Internal Facility Report and Resupply Form (IFRR) under IPLS system.

5.3 Suggestions for further research

Investigate the association, and impact of the studied variables in the IPLS system and how it affects the hospital. A similar study may also be carried out in other hospital to establish whether the findings are similar as those generalized in this study of the system. Investigate on other factors that influence good pharmaceuticals practice in the hospital. From the conducted study I have been aware that the IPLS is about to be changed to integrated financial management information system (IFMIS) so in order to tackle the same problem there should be further research and detailed out line of procedures for effective and efficient implementation of the new system.

Reference

Black Lion Hospital / Addis Ababa Directory. *[Online]* Ethio Visit. Available at http:// www.ethiovisit.com/directory/black-lion-hospital/1263/ /Accessed Dec. 2018/.

Bowersox, D.J., Closs, D. and Stank, T.P., 1999. 21st century logistics: *making supply chain integration a reality‖. Council of Logistics Management, Michigan State University*, East Lansing.

Banomyong, R., 2005. *Measuring the time conversion cycle in an international supply chain. Annual Logistics Research Network Conference Proceedings, Sept. 2005*, Plymouth, UK, available at: http://www.bus.tu.ac.th.

Dick M, Farai C, Joseph N. 2011 *South Sudan, Pharmaceutical Logistics Assessment Arlington*, va: DELIVER/john snow Inc. for the USAID.

Desale A., Tyae B, Nigatu A. 2013. *Assessment of laboratory logistics management information system practice for HIV/AIDS and tuberculosis laboratory commodities in selected public health facilities in Addis Ababa Ethiopia*. The Pan African Medical journal 15:46.

FMoH 2010. Ethiopian hospital reform implementation guideline, volume I chapter four, Addis Ababa, Ethiopia.

FMoH 2010. Ethiopian Hospital Reform Implementation Guidelines Volume 2, Addis Ababa, Ethiopia.

Global Healthcare Exchange 2011. *A Look inside your customer's world‖ Medical device supply chain council. Available*at www.medsupplychain.org/pdfs/GHXConway.

Hofman, D, 2004. *The hierarchy of supply chain metrics (performance). Supply Chain Management Review,* available at: http://www.highbeam.com/doc/1G1-122408969.html.

Hubner U.2008: *e Business in Healthcare, Springer, London, England*.

Kazemkhanlou, Hamid; Ahadi, Hamid Reza 2014. *Study of Performance Measurement Practices in Supply Chain Management, Proceedings of the 2014 International Conference on Industrial Engineering and Operations Management Bali, Indonesia*: 273-285.

Muluken L, Muluken M, and Fikadu M, 2015. The Integrated Pharmaceuticals LogisticsSystem (IPLS) Reduces Drug Stock Outs in Ethiopia's Amhara and Oromia Regions.

Pharasi B. 2007. *Assessment of the HIV/Aids Medical Supplies and Laboratory Commodities Supply Chain in Lesotho, Arlington,Va*: RPM Plus.

Pharmaceuticals Fund and Supply Agency (PFSA)2015. *Standard Operating Procedure Manual for the Integrated Pharmaceutical Logistics System in Health Facilities of Ethiopia. Addis Ababa*. FDRE PFSA.

Pharmaceuticals Fund and Supply Agency (PFSA). 2015. *Standard Operating Procedure Manual for the Integrated Pharmaceutical Logistics System in Health Facilities of Ethiopia. Addis Ababa*. FDRE PFSA.

Shewarega, A, Paul D, Welelaw N, Sami T, and Yared Y. 2015. *Ethiopia: National Survey ofthe Integrated Pharmaceutical Logistics System. Arlington*, Va.: USAID/ DELIVER, Task Orderand Pharmaceuticals Fund and Supply Agency (PFSA).

SC4ccM. 2012. Assessing training coverage of the Integrated Pharmaceutical Logistics System at selected Health Centers in four regions in Ethiopia using the Lot quality Assurance Sampling Method. Arlington, Va.: SC4CCM.

Stephens, S., 2000. *Supply Chain Council and Supply Chain Operations Reference Model overview. Supply Chain Council, Pittsburg*.

Tilahun A, Geleta DA, Abeshu MA, Geleta B, Taye B. 2016 *Assessment of Integrated Pharmaceutical Logistic System for the Management HIV/AIDS and Tuberculosis Laboratory Diagnostic Commodities in Public Health Facilities inAddis Ababa, Ethiopia*. J. Pharma Care Health System.

USAID | DELIVER, 2011. *The Logistics Handbook: A Practical Guide for the Supply ChainManagement of Health Commodities. Arlington*, Task Order 1.

USAID | DELIVER PROJECT 2014:*Health Logistics Quarterly, a quarterly newsletter. Volume 6.No.3. [Online] Deliver Project. Available*at http://deliver.jsi.com/dlvr_content/resources/allpubs/logisticsbriefs/ET_HLQ_Vol6no 3.

World Health Organization. 2004. *Equitable Access to Essential Medicines. A framework for collective action. WHO Policy Perspective on Medicine*. Available at http:/whqlibdoc.who.int/hq/2004/WHO EDM 2004.4pdf

Wondimieneh Sewuye.2013. *Supply chain management practices of pharmaceuticals manufacturing companies of Ethiopia: the case of Ethiopian pharmaceuticals manufacturing Share Company*. pp 12.

ADDIS ABABA UNIVERSITY, SCHOOL OF COMMERCE

Dear Respondents

"Good day to you. My name is **Henock Shimeless**. I am a student of Logistics and Supply Chain Management MSC program in School of Commerce, Addis Ababa University. I am here to collect data about the Integrated Pharmaceutical Logistic System Implementation and its role on the Performance of Black Lion Hospital that is needed for my thesis:

This questionnaireneeds your honest response that will help me to find out the real and critical problems in those. So, I need you to give me your true response for the questions that I am going to ask you. The study does not have any other purpose rather than finding theIntegrated Pharmaceutical Logistic System Implementation and its role on the Performance of Black Lion Hospital and help the concerning body to set the appropriate solution for the problems to be found.All of the information collected is strictly confidential.I look forward for your kind co-operation.

- *Henock ShimelessTel No.0923576051*
- *Email:-hemenshmeless@gmail.com*

Thank you in advance for your cooperation!

Instruction

- ✓ Please answer all questions
- ✓ Please do not discuss with other respondents to give your answer
- ✓ Put **(√)** sign in the box provided to give your answer

1. Part one: -Personal Information

Tick boxes to answer questions. Write in the space provided if it's needed

1. Your profession background……

2. Your work experience in the industry

☐Less than one year ☐1-5 years☐5-10 year's ☐above 10 years

3. Please indicates your educational level;

☐High school ☐College diploma ☐B.Sc. degree☐Masters and above

1: -PartOne:-for the followings are sought to**Assess the role of IPLS for Implementation in the Black Lion Hospital.**Hence, rank them '5' for"Strangely Agree", 4for "Agree" 3 for "Neutral" 2 for "Disagree" 1 for "Strangely Disagree".

Roleof IPLS		1	2	3	4	5
NO	**A. Warehousing practices**					
1	Storing products according to recommended storage guidelines is practiced using IPLS					
2	Storage space optimization is being practiced using IPLS					
3	Accurate identification of all storage locations is practiced using IPLS					
4	Waist-level handling and lifting aids usage is practiced using IPLS					
5	Making the records and reports of warehouse up to date is practiced using IPLS					
	B. Transportation					
1	Collaborative relationships with transport companies is practiced using IPLS					
2	Strategic use of third-party transport logistics providers is practiced using IPLS					
3	Measuring the transport performance is practiced using IPLS					
	C. purchase practices					
1	Effective implementation of purchase order processing is practiced using IPLS					
2	Effective communications with suppliers on research activities and new product development is practice using IPLS					
3	Transparent information sharing about each other's inventory status with suppliers is practiced using IPLS					
4	procurement limit to the essential drugs list is practiced using IPLS					
	D. Inventory management practices					
1	Correct identification of all materials in the stock /availing nice inventory informationis practiced using IPLS					
2	Replenishment planning and inventory deployment is practiced using IPLS					
3	Having a system for wastage free utilization of available materials inventory is practiced using IPLS					
4	Ensuring the stock levels within the established maximum stock levels and emergency order point/ optimal inventory positioning is practiced using IPLS					
	E. Production (customer)practices					
1	Responding quickly to the customer's needs is practiced using IPLS					
2	Fulfilling customer orders in the promised date is practiced using IPLS					
3	Measuring and evaluating customer satisfaction level is practiced using IPLS					
4	Creating long-term relationships with your customers is practiced using IPLS					

ANNEX 3: QUESTIONER

2. **PART TWO: -**The followings are sought**determine for IPLS Implementation to improve the Performance of Black Lion Hospital**. Hence, rank them '1' for"STRONGELY AGREE", 2 FOR "AGREE" 3 FOR "NEUTRAL" 4 For "DISAGREE" 5 for "STRONGELY DISAGREE".

NO	**Challenge for IPLS**	1	2	3	4	5
I.	**IPLS Implementation system Cost**					
1	IPLS Implementation reducesthe cost of the hospital					
2	IPLS Implementation system reduces the cost of the warehouse for the hospital.					
3	IPLS Implementation costis reduces the cost of the Transpiration for the hospital.					
II.	**IPLS Implementation system time**					
1	IPLS Implementationreduces response time compared to manual to system.					
2	IPLS Implementation reduces the warehouse response.					
3	IPLS Implementation reduces transportation responds.					
III.	**IPLS Implementation systemflexibility**					
1	IPLS Implementation is easy system for operation					
2	IPLS Implementation is easy system reduce warehouse controlling system					
3	IPLS Implementation is easy systemreduce transportation controlling system					
4	IPLS Implementationhas made the hospital controlling system easy					
5	IPLS Implementation is easy systemreduce inventory controlling system					
6	IPLS Implementation improves the flexibility of rendering the service					
7	IPLS Implementation increase reliability of the hospital's service.					

ANNEX 3: QUESTIONER

3. PART THREE:-The followings are **Factor hindering (challenge)** the IPLS Implementation in the Black Lion Hospital. Hence, rank them '5' for the most challenge factor and ''1'' for the least challenge factor.

No.	Factors hindering IPLS Implementation system	Rank				
A	**Political Factor**	1	2	3	4	5
1	The existing government regulation and law hindering the implementation of IPLS					
2	Theexisting e documented policy or guiding for drug selection hindering the implementation of IPLS					
B	**Technological Factor**					
1	Lack of awareness on how to use IPLS hinders the implementation of the system					
2	Resistance to change by employees hinders IPLS implementation system					
3	Lack of appropriate performance matrixhindersIPLS implementation system					
4	ICT Infrastructure hinders IPLS implementation					
C	**Economical Factor**					
1	Financial constraint in the hospital hinders the Implantation of IPLS					
2	The overall inflation of the economy hinders IPLS implementation					
3	Unavailability of finance to support the system hinders IPLS Implementation system					
B	**Organizational Internal factor**					
1	People altitude towards the system of IPLS hinders the implementation					
2	Lack of training IPLS hinders its implementation					
3	Lack of top management commitment hinders IPLS implementation					
4	Employee skill hinders the IPLS implementation					

ANNEX 3: QUESTIONER

ANNEX 3: QUESTIONER

Part4: - Interview Questionnaire

1. What are the roles of IPLS implementation on the performance of Black Lion Hospital?
2. To what extent IPLS implementation improves the performance of Black Lion Hospital?
3. What are the major challenges hindering the IPLS implementation in Black Lion Hospital?

Thank very much for your time.

ANNEX 4: INTERVIEW PROTOCOL

Annex 1: internal facility report and resupply form (IFRR)

Internal Facility Report and Resupply Form (IFRR)

Name of Dispensing Unit: OPD PHARMACY			**Maximum Stock Quantity: one month**								
Reporting period From _____30/06/2011_____			**To _____30/07/2011_____**								
Ser.No.	**Product Description**	**Unit of issue**	**Completed By Unit**						**Completed By Store**		
			Beginning Balance	**Quantity Received**	**Loss/ Adjustment**	**Ending Balance**			**Calculated consumption**	**Maximum Quantity**	**Quantity Needed to Reach Max**
			A	**B**	**C**	**D**	**E**	**F**	**E=A+B+/-C-D**	**F=E*2**	**G=F-D**
	Product Descrip+B4:G354tion	**Unit of issue**	**Completed By Unit**								
			Beginning Balance	**Quantity Received**	**Loss/ Adjustment**	**Ending Balance**					
			A	**B**	**C**	**D**			**E**	**F**	
1	**Alprazolam 0.5mg**	**Tab**	**80**	0		80			**0**	**0**	**-80**
2	**Biphasic Insuline suspension**	**vial**	**111**	**100**		111			**100**	**200**	**89**
3	**Bromazepam 3mg**	**tab**	**947**	**1000**		1000			**947**	**1894**	**894**
4	**Chlordiazepoxide 5mg+Clinidium 2.5mg**	**tab**	**1780**	**0**		340			**1440**	**2880**	**2540**
5	**Clonazepam 0.5mg**	**tab**	**0**	**0**		0			**0**	**0**	**0**
6	**Clonazepam 2mg**	**tab**	**0**	**0**		0			**0**	**0**	**0**
7	**Clozapine 100mg**	**tab**	**0**	**0**		0			**0**	**0**	**0**
8	**Codain phosphate 30mg**	**tab**	**0**	**0**		0			**0**	**0**	**0**
9	**Diazepam 10mg/2ml inj.**	**amp**	**184**	**0**		90			**94**	**188**	**98**
10	**Diazepam 5mg tab**	**tab**	**3510**	**0**		2400			**1110**	**2220**	**-180**

Annex 2: OPD Pharmacy inventory from 04/05/2011-03/06/2011

OPD Pharmacy Inventory From 04/05/2011-03/06/2011

Name of Health Facility -TASH--------Section(unit)----OPD-----Page number----1--------Date 11/06/2011

S.No	To be filled before Physical inventory					To be filled during physical inventory	To be filled after Physical Inventory	
	Drug Code	Description of the drug(name dosage form, strength and brand)	Batch Number	Retail price	Expiry Date	Physical quanity	Unit cost	Total Price
1	insb-32-2	Biphasic Insuline suspension	OO61	107.90	Jun-20	111		
2	barb-10-3	Phenobarbitone 15mg				0		
3	barb-13-2	Phenobarbitone 100mg	04822PE	0.55	04/01/20	42200		
4	barb-13-1	Phenobarbitone 30mg	27454	0.15	10/01/20	14900		
5	brom-11-1	Bromazepam 3mg	E8A023	0.70	01/01/19	970		
6	cdcb-10-2	Chlordiazepoxide 5mg+Clinidium 2.5mg	71796	1.25	03/01/22	340		
7	Clon 12-1	Clonazepam 0.5mg	7532	1.65	Jan-21	0		
8	clon-11-1	Clonazepam 2mg	77095	1.80	06/01/21	0		
9	Cloz 12-1	Clozapine 100mg	68919	6.05	06/30/19	500		
10	code 10-1	Codain phosphate 30mg	602618	3.20	12/01/18	0		