ADDIS ABABA UNIVERSITY COLLEGE OF BUSINESS AND ECONOMICS SCHOOL OF COMMERCE

LOGISTICS AND SUPPLY CHAIN MANAGEMENT DEPARTMENT

THE DETERMINANTS OF PUBLIC PHARMACEUTICAL PROCUREMENT PERFORMANCE: THE CASE OF ETHIOPIAN PHARMACEUTICAL SUPPLY SERVICE HEAD OFFICE

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR DEGREE OF MASTER OF ART IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT

By: Cherinet Demissie Mersha

Advisor: Busha Temesgen (PhD)

June, 2024

Addis Ababa, Ethiopia

ADDIS ABABA UNIVERSITY COLLEGE OF BUSINESS AND ECONOMICS SCHOOL OF COMMERCE

LOGISTICS AND SUPPLY CHAIN MANAGEMENT DEPARTMENT

This is to certify that Cherinet Demissie's thesis, entitled "**The Determinants of Public Pharmaceutical Procurement Performance: The Case of Ethiopian Pharmaceutical Supply Service Head Office.**" has been submitted in partial fulfillment of the requirements for award of the degree of Master of Art in Logistics and Supply Chain Management. It complies with the regulations of the University and meets the accepted standards with respect to originality and quality of his original work.

Approved by the Board of Examiners

Advisor	**Signature**	**Date**
Busha Temesgen (PhD)	_____	_____
Internal Examiner		
Kirubel Bruck (PhD)	_____	_____
External Examiner		
Anwar Yimam (PhD)	_____	_____

_____

Chair of Department or Graduate Program Coordinator

DECLARATION

I hereby declare that the research presented in this thesis titled with "The Determinants of Public Pharmaceutical Procurement Performance: The Case of Ethiopian Pharmaceutical Supply Service Head Office." is my own original work. Further, the study has not been done and presented for a similar or any diploma or degree awards in any other universities. All the resource materials used in this research paper have been duly acknowledged.

Signature: _____

Researcher Name: Cherinet Demissie Mersha

Date: _____

CERTIFICATION

This is to certify that Cherinet Demissie has conducted the research thesis entitled "**The Determinants of Public Pharmaceutical Procurement Performance: The Case of Ethiopian Pharmaceutical Supply Service Head Office**" and submitted in partial fulfillment of the requirements for award of the degree of Master of Art in Logistics and Supply Chain Management of Addis Ababa University complies with the regulations of the University and meets the accepted standards with respect to originality and quality of his original work.

Advisor: Busha Temesgen (PhD)

Signature _____

Date _____

DEDICATION

I dedicate this research study to my brother- in- law, Biruk Zemelak, who went early to the eternal life. Biruke, though our hearts break and we grieve, we will embrace tightly to the memories we create. Because of the immense impact you had during your life and the legacy you left behind; it will never fade. Your triplet kids are growing well with family love. You always remain within the whole family hearts.

ACKNOWLEDGEMENT

"Give thanks to the Lord for he is good, his mercy endures forever." Psalm 118:1. At the outset, I would like to thank Almighty God for giving me the health, motivation and strength that are needed to complete my study successfully. My next heartfelt acknowledgment goes to St. Mary for being with me through every of my life chapter.

My gratitude also goes to Dr. Busha Temesgen for his willingness to devote his time in providing valuable and constructive academic feedback on this study.

I would also like to express my gratefulness to Ethiopian Pharmaceutical Supply Service staff who have participated in this study as respondents for their kind support during the data collection.

Lastly, I would like to extend my gratitude to my beloved wife, Etsehiwot Zemelak, my children (Kiyom Cherinet, Samias Cherinet and Michael Cherinet) and friends for their continued support and encouragement during this study period.

ACRONYMS

eGP	Electronic Government Procurement
EPSA	Ethiopian Pharmaceutical Supply Agency
EPSS	Ethiopian Pharmaceutical Supply Service
ERP	Enterprise Resource Planning
FPPA	Federal Public Procurement and Property Authority
ICT	Information and Communication Technology
MOFED	Ministry of Finance and Economic Development
PFSA	Pharmaceutical Fund and Supply Agency
PP	Public Procurement
PSTP	Pharmaceutical Supply Transformation Plan
SOP	Standard Operating Procedures
SPSS	Statistical Package for Social Science
TOE	Technology, Organization and Environment
WHO	World Health Organization

Table of Contents

List of Tables

List of Figures

ABSTRACT

Weak pharmaceutical procurement performance can undermine the effectiveness and efficiency of healthcare delivery systems and hinder efforts to improve public health outcomes. The main objective of the study was to assess determinants of public pharmaceutical procurement performance in Ethiopian Pharmaceutical Supply Service Head Office. The study deployed mixed research approach and used both descriptive and explanatory research design. The study population was staff members of EPSS working in Inbound logistics wing and who were directly or indirectly involved in the procurement process and a census sampling technique was conducted. Eighty questionnaires were disseminated and seventy-six were valid responses and analyzed via SPSS version 26. Descriptive and inferential statistics were used to analyze the determinants of public pharmaceutical procurement performance. The findings of the multiple regression analysis showed that there is a significant and positive association between procurement rules and regulations, ICT utilization and employee competency and pharmaceutical procurement performance of EPSS. The coefficient of determination represented by R^2 indicated that the percentage of variance in pharmaceutical procurement performance explained by predictor variables was 93.7%. The study also found that pharmaceutical procurement performance of EPSS is negatively correlated with and significantly impacted by procurement planning. The study recommended that to further improve the pharmaceutical procurements performance, EPSS should advocate the revision of existing the rules and regulations of public procurement considering unique nature of pharmaceutical, should invest in technology infrastructure and systems that streamline procurement processes, such as e-procurement platforms such as electronic government procurement and enterprise resource planning, should enhance the competency and skills of procurement staff through targeted training and professional development programs.

***Key words*:** *procurement planning, employee competency, ICT Utilization, procurement performance*

CHAPTER ONE

INTRODUCTION

This chapter encompasses the following sub sections: background of the study, statement of the problem, basic research questions, objectives of the study, significance of the study, scope of the study, limitations of the study, definition of terms and organization of paper.

1.1 Background of the study

Procurement is a crucial strategic business management function that helps to manage the entire process, including risk management, value engineering, regulatory compliance, product identification, forecasting, sourcing and logistics (Mazibuko & Fourie, 2017). Procurement is the process by which a variety of public, private, national and local entities obtain services, supplies, and equipment in compliance with applicable rules and regulations. It occurs locally, nationally, and worldwide (Antony & Josphat, 2016). In public health sector, procurement is a strategic business function that is intended to consult the market while buying pharmaceutical and other health products (EPSS, 2020).

Public procurement (PP) is defined as procurement by a public body using public fund according to the Ethiopian Public Procurement Proclamation No. 649/2009 (FDRE, 2009). Public procurement refers to the acquisition of goods, services, and works by government agencies and state-owned businesses. Because public procurement involves a sizable portion of taxpayer funds, governments must manage public procurement effectively while upholding strict guidelines to guarantee high-quality service delivery and the preservation of the public interest. Effective public procurement is the only way it can benefit all parties involved (Ngari & Machoka, 2020). In order to help the public sector accomplish its goals and prepare for the uncertainties that lie ahead, procurement is essential (Omanji, 2018).

Pharmaceuticals are essential to the operation of contemporary health systems, and efficient access control is necessary to guarantee that people may obtain high-quality, reasonably priced healthcare and enjoy healthy lives (Asif, 2022).

Purchasing pharmaceuticals is an essential part of a successful medicine supply chain that impacts healthcare institutions of all sizes. A well-managed pharmaceutical procurement process ensures that the right drugs are available in the right amounts, at reasonable prices, and with well defined quality criteria. Without a systematic and polite procedure, acquiring pharmaceuticals may often lead to resource waste, poor product quality, overstocks, disruptions in the delivery of life-saving drugs, and even the loss of human life (PFSA, 2016).

The procurement of pharmaceutical is a complex process involving multiple organizations, ministries, and manufacturers. The existing administrative frameworks and procurement practices may often be inadequate, posing challenges in effectively responding to the dynamic pharmaceutical market. Market restrictions vary across countries, and the purchase of pharmaceutical by the public sector must navigate both domestic and global pharmaceutical markets (Berhie, 2017). Public health officials may lack the expertise needed to design the most effective procurement system for a given market environment. Consequently, an increasing number of countries are exploring or have already transitioned away from a solely public-sector-driven pharmaceutical procurement and distribution system. Instead, they are considering ways to involve the private sector with the aim of improving public health outcomes (Berhie, 2017).

Procurement performance refers to an organization's capacity to accomplish its goals through effective management, robust governance, and a steadfast commitment to obtaining outcomes. Businesses that provide services need to look at productivity from both a company and a customer-centric perspective when analyzing it. This broader strategy can aid in resolving disputes or utilizing opportunities for improvement in both service productivity and quality (Omanji, 2018).

Researchers, practitioners, academics, and researchers all paid close attention to procurement performance because of subpar execution caused by a disdain for proper protocols and rules (Kakwezi & Nyeko, 2019). By putting strong and clear procurement procedures in place, modern firms hope to increase productivity, accountability, and cost-effectiveness (Njagi & Shalle, 2016). Organizations must measure procurement performance in order to pinpoint areas for development, boost productivity, and allocate resources as efficiently as possible. Time and transaction costs are two important key indications and factors that are used to evaluate how

successful the procurement process is. Transaction cost, timely delivery, and quality index were employed by Ndemo and Achuora (2020) as performance measures for procurement.

Different scholars identified various determinants for procurement performance of an organization. Studies conducted by Mekonnen *et al.* (2018) and Lemma *et al.* (2019) revealed that effective procurement planning ensures timely availability of pharmaceuticals, reduces stockouts, and improves overall supply chain management. Another study conducted by Kebede *et al.* (2016) and Demissie *et al.* (2018) showed that competent procurement staff contribute to better negotiation outcomes, contract management, and compliance with procurement procedures. Information and Communication Technology (ICT) Utilization plays to streamline the procurement processes, reduce paperwork, enhance transparency, and improve decision-making according to Tesfaye and Zeleke (2017) and Woldeyes *et al.* (2019).

Established by proclamation number 553/2007, the Ethiopian Pharmaceutical Supply Agency (PFSA) now named Ethiopian Pharmaceutical Supply Service (EPSS) is a public organization responsible to procure and distribute quality assured vital and essential medicines, medical supplies, laboratory reagents, chemicals, and medical devices to public health facilities at an affordable price in a sustainable manner (FDRE, 2007).

Over the years, the EPSS has managed a tremendous expansion in both the volume and type of products it procures. Between the 2015/16 and the 2022/23, the overall value of pharmaceutical procured grew to approximately ETB 17.7 billion (EPSA, 2020). Though the volume and variety of essential pharmaceutical procured by EPSS increases from time to time, the Pharmaceutical Supply Transformation Plan II (PSTP II) and the procurement strategic document of EPSS identified weak demand planning, repetitive tendering and procurement, little emphasis on market shaping activities, and long procurement lead times, linear evaluation mechanisms (single criteria of pricing), limited tender management processes and the lack of procurement data automation and integration are among the operational constraints of the national pharmaceutical procurement system (EPSA, 2020 & EPSS, 2023).

Considering these constraints, this study attempted to assess determinants of public pharmaceutical procurement performance in Ethiopian Pharmaceutical Supply Service. Hence,

the study is important to design effective interventions that improve the public pharmaceutical procurement performance for Ethiopia.

1.2 Statement of the Problem

In Ethiopia, the government spends about 65% of the annual budget for public procurement according to Electronic Governmental procurement strategy and roadmap (MOF, 2018). In order to ensure that public funds are used as effectively and economically as possible, procurement procedures are created to produce high-quality goods and services on schedule and under budget, giving the most value for the money. Obtaining products at the right time, right quantity, right place, and right price is one of the procurement principles that aims to maximize economy, efficiency, and effectiveness (Jarvis, 2018; MOFED, 2010).

The share of pharmaceutical procurement by EPSA in relation to its total expenditure was 89% in 2018/19. A five-year trend analysis showed that the annual pharmaceutical procurement value increased from 13.3 billion ETB in 2018/19 to 17.7 billion ETB in 2022/23 (EPSA, 2020 &EPSS, 2023).

The PSTP II and the procurement strategic document of EPSS identified weak demand planning, repetitive tendering and procurement, little emphasis on market shaping activities, and long procurement lead times, linear evaluation mechanisms (single criteria of pricing), limited tender management processes and the lack of procurement data automation and integration are among the operational constraints of procurement system of EPSS (EPSA, 2020). In addition, a comprehensive market shortcomings assessment conducted by EPSA in collaboration with a development partner named Results for Development (R4D) identified that long procurement lead time, poor procurement planning like frequent fragmented request, low staff competency, limited supply base, absence of supplier prequalification system were among the major shortcomings related to procurement process of EPSS. In addition, this assessment revealed the public procurement regulations didn't consider the nature of pharmaceutical procurement (EPSA, 2020).

A study conducted by Moges (2020) revealed that ineffective coordination among stakeholders during the procurement process, incompatible regulations, superfluous procedures and bureaucracy, inadequate planning of the procurement process, and other factors lead to

disruptions in the supply of health commodities, interruptions in services, wastage of scarce resources, dissatisfaction among customers, and the loss of precious human life.

Understanding the precise impact of procurement planning on procurement performance is crucial for enhancing efficiency and effectiveness in pharmaceutical supply chain management. A study by Mekonen *et al.* (2018) on public procurement in Ethiopia found that effective procurement planning significantly improved procurement performance by ensuring timely availability of pharmaceuticals and reducing stockouts. Another study by Lemma *et al*. (2019) highlighted that proper procurement planning enhanced transparency and accountability in the procurement process, leading to better management of pharmaceutical supplies. However, certain researches contend that rigid compliance with purchase planning may result in the loss of chances for financial gains and inventiveness in ever-changing marketplaces. According to a study by Boulton and Collins (2019), excessively strict procurement planning may limit an organization's ability to adapt quickly to changes in the market, especially in sectors where supplier landscapes and technology are changing quickly.

To optimize procurement methods and ensure openness and accountability, it is imperative to examine the degree to which these rules and regulations impact procurement outcomes. Extensive compliance with Ethiopian procurement laws and regulations enhanced procurement effectiveness and decreased cases of malpractice and corruption, according to research by Taddese *et al.* (2017). According to Abera and Bezabih's (2020) study, procurement outcomes were improved by fostering fair competition and shortening lead times through the enforcement and clarity of procurement legislation. There are also arguments that stricter rules and regulations pertaining to procurement can lead to an increase in bureaucracy and administrative burden, which could cause procurement procedures to take longer. Overly stringent rules have the ability to deter prospective suppliers, thereby impeding market competition and innovation. According to research by Smith and Jones (2018), there have been instances where complex procurement procedures have impacted overall procurement efficiency by causing delays and cost increases as a result of compliance issues.

Another study conducted on factors affecting procurement performance indicated that staff competence and resource allocation were the most important factors affecting procurement

performance in Awassa Textile Share Company (Hamza *et al.,* 2016). Some points of view contend that a restricted emphasis on technical proficiency may undervalue the significance of innovation and strategic planning in the procurement process. According to a study by Roberts *et al.* (2020), broader abilities like innovation, stakeholder management, and negotiation are just as important for successful procurement performance in complicated situations as technical competence.

Leveraging technological improvements to improve overall procurement outcomes and streamline processes requires examining the influence of ICT adoption on procurement efficiency and effectiveness. According to a study by Tesfaye and Zeleke (2017), Ethiopia's public sector adopted ICT technologies including e-procurement platforms to speed procurement procedures, cut reduced paperwork, and increase accountability and transparency. Woldeyes *et al.* (2019) conducted another research that showed how the use of ICT in procurement resulted in improved data accuracy, quicker processing times, and better decision-making when buying medications. However, some studies contend that a substantial upfront investment in technological infrastructure and training is necessary for the use of ICT in procurement. Furthermore, stakeholders used to conventional procurement procedures may oppose technological solutions, which could have an impact on user acceptance and implementation success. According to a study by Brown and Miller (2017), there have been instances where ICT deployment in public procurement has run into difficulties because of high costs, difficult system integration, and privacy and data security concerns.

The growing number of fragmented, low volume procurement requests leads to poor procurement visibility, weak supplier performance evaluation, weak supplier pre-qualification implementation, and repetitive tender planning. These are some of the issues pertaining to procurement performance. The EPSA is required to engage in repetitive based tendering, wasting money and employee time and affecting the effectiveness and efficiency of procurement performance (PFSA, 2017)

In order to accomplish its goals, the procurement function must adjust how it carries out internal and external processes and procedures. The ability to achieve procurement objectives is impacted by both external and internal factors. The performance of the procurement function is influenced

by a number of factors, including professionalism, staffing levels and budgetary resources, central or decentralized procurement organizational structure, internal control policies, and procurement laws, rules, and guidelines. Furthermore, public procurement must contend with the obstacles posed by a wide range of environmental factors, also referred to as external factors, including the market, the legal and political environments, organizational environments, and socioeconomic environments (Kakwezi & Nyeko,2019).

Numerous studies on the performance of public procurement have been carried out. However, many existing studies have not sufficiently addressed and investigated the determinants influencing public pharmaceutical procurement performance within the Ethiopian pharmaceutical supply chain, leading to knowledge gap (Kibret, 2018 & Ararsa, 2020). In response to this deficiency in the case of pharmaceutical supply chain, the current study aims to assess the determinants of public pharmaceutical procurement in the Ethiopian Pharmaceutical Supply Service. The focus of this study will be to assess the determinants of public pharmaceutical procurement performance in terms of procurement planning, procurement rules and regulations, employee competency and the utilization of information and communication technology (ICT) in EPSS. The research endeavors to bridge the existing knowledge gaps and formulate effective interventions to enhance the overall performance of public pharmaceutical procurement in the Ethiopian context. To this end the study attempted to address the below research questions.

1.3 Basic Research Question

Below are the basic research questions addressed:

1. What is the effect of procurement planning on public pharmaceutical procurement performance in Ethiopian Pharmaceutical Supply Service Head Office?
2. To what extent do procurement rules and regulations affect the performance of public pharmaceutical procurement in Ethiopian Pharmaceutical Supply Service Head Office?
3. To what extent does employee competency affect the performance of public pharmaceutical procurement in Ethiopian Pharmaceutical Supply Service Head Office?
4. What is the effect of information and communication technology utilization (ICT) on public pharmaceutical procurement performance in Ethiopian Pharmaceutical Supply Service Head Office?

1.4 Objectives of the study

The study had a general objective and specific objectives stated as follows.

1.4.1 General Objective of the study

The general objective of the study was to assess determinants of public pharmaceutical procurement performance in Ethiopian Pharmaceutical Supply Service Head Office.

1.4.2 Specific objectives of the study

The specific objectives of the study were:

1. To assess the role of procurement planning in determining the public pharmaceutical procurement performance in Ethiopian Pharmaceutical Supply Service Head Office.
2. To measure the role of procurement rules and regulations in determining the public pharmaceutical procurement performance in Ethiopian Pharmaceutical Supply Service Head Office.
3. To measure the role of employee competency in determining the public pharmaceutical procurement performance in Ethiopian Pharmaceutical Supply Service Head Office.
4. To assess the role of information and communication technology (ICT) utilization in determining the public pharmaceutical procurement performance in Ethiopian Pharmaceutical Supply Service Head Office.

1.5 Significance of the study

The findings of the study will be useful for EPSS to understand about the determinants of public pharmaceutical procurement and hence, EPSS would be able to use information provided by the study to work on areas that are necessary to enhance the performance of the procurement process there by applying the recommendations forwarded.

The study provided pertinent information to the concerned stakeholders of the health sector on the determinants of public pharmaceutical procurement.

For the researcher, it helped to identify and give broad understanding on the public pharmaceutical procurement and determinants of its performance. Additionally, the researcher got the benefits of acquiring research skills through this endeavor and awarded a Master's Art in logistics and supply chain management upon the successful completion of the study.

The study may contribute to the body of knowledge on the topic and could serve as a resource for academics and researchers working on related studies in the future. The study also helps Ethiopian policymakers involved in pharmaceutical procurement to better understand the determinants of procurement performance in these contexts. This helps them develop suitable policies that allow the procuring entities in health sector to develop suitable strategies for enhancing pharmaceutical procurement performance.

1.6 Scope of the study

EPSS is conducting centralized pharmaceutical procurement at its head office level and the scope of the study is limited to EPSS's procurement operations that are implemented under the inbound logistics wing. Accordingly, the study included three directorates of EPSS named Quantification and Market Shaping, Tender Management and Contract Management which are involved in day-to-day procurement related activities.

Moreover, the scope of this study was confined to the evaluation of public pharmaceutical procurement performance. It involved an examination of determinants influencing public pharmaceutical procurement performance, such as procurement planning, procurement rules and regulations, employee competency and the utilization of information and communication technology (ICT) at EPSS head office.

1.7 Limitation of the study

Every study is inherently bound by its unique set of limitations due to variations in settings, circumstances, and other contextual factors. The research constructs did not encompass all relevant actors, including suppliers and customers, thereby limiting its generalizability. Additionally, the study's specific focus on a particular framework for evaluating factors influencing EPSS's procurement performance means that it did not cover all the constructs that could elucidate pharmaceutical procurement performance comprehensively.

Furthermore, a few respondents failed to submit the questionnaires on time, and some participants mentioned their hectic work schedules for not wanting to set aside time to complete it. However, the researcher took steps to address these limitations by providing clear explanations about the study's purpose and expected outcomes to the respondents. Despite these

challenges, efforts were made to mitigate potential issues related to time constraints and punctuality.

1.8 Operational definition of terms and concepts

Procurement: the process of acquisition of goods, services and works (MOFED, 2010).

Public procurement: is a procurement by a public body using public fund (FDRE Proclamation No. 649/2009).

Procurement performance: a way to assess how well the procurement function can meet the goals and objectives at the lowest feasible cost and in a reasonable amount of time by improving its quality (Gebreab, 2022).

Procurement planning: is the first step in the procurement process and its purpose is to assure that the necessary funds are available for the purchase as well as that the right procedure is followed and that the contract type selected is appropriate for the specific purchase of goods, services, or works (Moges, 2020).

Public procurement rules and regulation: The policies and procedures put in place to control the acquisition of products and services required for an organization to run effectively (Gikonyo, 2014).

Employee competency is defined as having the necessary knowledge and abilities to enable a person to carry out activities efficiently and make wise judgments in a variety of circumstances. It involves more than just theoretical comprehension; it also involves using knowledge and abilities in real-world situations (Aketch and Karanja, 2013).

ICT utilization: means the use of information and communication technology in the procurement process.

Pharmaceutical: means any substance or mixture of substances used in the diagnosis, treatment, mitigation or prevention of a disease, and includes medical instruments and medical supplies. (FDRE Proclamation No. 553/2007).

Service: The Ethiopian Pharmaceutical Supply Service (EPSS)

1.9 Organization of the study

There are five chapters in the research paper. The first chapter is an introduction that includes background of the study, the statement of the problem, research questions, objectives, the significance of the study, the scope of the study, limitations and definitions of terms and concepts. The related literatures on public pharmaceutical procurement performance and its determinants are narrated in the second chapter. To postulate the conceptual framework, a theoretical and an empirical literature review are included.

The study area, research approach, research design, population & sampling, data collection procedures, data analysis, validity, reliability, and ethical considerations are all covered in the third chapter on research methodology.

The fourth chapter presents data analysis, results and discussions. The fifth chapter includes a summary, conclusions, recommendations and areas for additional study that need to be investigated.

CHAPTER TWO

RELATED LITERATURE REVIEW

2.1. Introduction

This chapter presents the theoretical literature review and empirical review. It includes the theoretical review and particulars of the public procurement performance. To establish a foundation for the study, empirical studies pertaining to the study variables were reviewed. The conceptual framework of the study and identified literature gaps are also part of this chapter.

2.2. Theoretical Literature Review

2.2.1. Public Pharmaceutical Procurement and its performance

Public procurement is the comprehensive process of obtaining goods, works, and services. It encompasses all functions from identifying needs, selecting and soliciting sources, preparing and awarding contracts, to overseeing all phases of contract administration using public funds (UNIDO, 2017).

Because public procurement plays a key role in determining overall performance, it is regarded as the core of public institutions. Determinations made at the policy level may benefit or suffer from these actions. In summary, public institutions' total performance and success are greatly influenced by the efficacy of public procurement (Patrucco *et al.*, 2017).

It is the process by which government agencies source products, services, and building and development projects from vendors in both domestic and foreign markets. General guidelines like justice, equitability, openness, competitiveness, and cost-effectiveness regulate this process (Naomi & Karanja, 2016). Basic laws and regulations that outline what is allowed and not allowed in certain procurement procedures control public procurement. Transactions must take into account factors like responsibility, economy, and non-discrimination among possible providers and respect for international obligations (Legesse, 2017). Through the creation and implementation of rules and regulations, governments regulate the conduct of public procurement (Nijboer *et al.*, 2017). These legislative frameworks protect moral and legal principles while ensuring openness, equity, and effectiveness in the public procurement process.

A key factor in improving the public's access to and cost of necessary medications is efficient procurement. Organizations may guarantee the timely and economical acquisition of medications by optimizing the procurement process, which will eventually improve patient outcomes (Alefan *et al.,* 2018). Suppliers may offer acceptable quality, service, and pricing within a reasonable delivery timeframe with the help of an efficient public procurement system (WHO, 2020). Conversely, ineffective procurement performance raises costs, decreases competitiveness within the procurement department, and increases inefficiencies.

Pharmaceutical procurement is a multidisciplinary process and involves knowledge of medicine, pharmacology, management, finances, and frequently politics. The right medications should be available for the right patients at the right times, in the right quantities, at fair costs, and with recognizable standards of quality thanks to an efficient pharmaceutical procurement process (Shrestha *et al*, 2018). Pharmaceutical procurement is a vital aspect of logistics management, and it significantly affects availability and overall supply chain costs (Negera *et al*, 2021). Acquiring high-quality pharmaceutical at reasonable costs for a specific population is the goal of public pharmaceutical procurement. The effectiveness and management of the procurement process undoubtedly have an impact on the accessibility and cost of pharmaceutical products. Undoubtedly, a lot of low and middle-income countries frequently struggle with inadequate public supply networks. There could be several factors contributing to this, including overall neglect, poor management, a lack of transparency, and a shortage of skilled procurement specialists (Kohler & Dimancesco, 2020).

Obtaining necessary medications in appropriate dose forms and amounts at reasonable costs is one of the most important tasks performed by the healthcare system. Finding and vetting the producers or suppliers of each drug, arranging funding for its purchase, and confirming the physical commodities' quality after they are obtained are all essential (Guyer, 2021).

One of the most important goals in public sector procurement is to get the most value for the money. Economy, efficiency, and effectiveness are the three strategies for attaining financial savings (Carter, 2018). Carter provided the following definitions for these concepts. The goal of economy is to achieve cost-effectiveness by reducing the cost of resources utilized or eschewing pointless expenditures. The goal of efficiency is to maximize output or accomplish goals with the

least amount of resources or input. Effectiveness means achieving intended goals and objectives in a manner that aligns with organizational priorities.

Organizations must measure procurement performance in order to pinpoint areas for development, boost productivity, and allocate resources as efficiently as possible. Time and transaction costs are two important key indications and factors that are used to evaluate how successful the procurement process is. Ndemo and Achuora's (2020) study included quality index, timely delivery, and transaction cost as performance metrics for procurement.

2.2.1.1. Cost

In the context of procurement and healthcare, costs play a crucial role. Understanding the various types of costs involved in the procurement and utilization of pharmaceutical is essential for healthcare organizations to make informed decisions, optimize resource allocation, and provide high-quality care within budgetary constraints. Mason (2018) revealed that the goal of cost management is to control spending so that expenses are minimized without affecting quality.

Achieving the lowest possible total cost is one of the strategic goals of procurement and distribution systems, taking into account a number of factors, including the actual cost of purchasing drugs, hidden costs associated with subpar products, unsatisfactory supplier performance, or short shelf lives, costs associated with holding inventory at different supply system levels, and operating and capital loss expenses incurred by management and administration of the procurement and distribution system (Berhie, 2017).

2.2.1.2. Time

Since time is a critical variable in the supply chain and time loss must be minimized, there has been an increased awareness of time and responsiveness in recent years. A typical objective in purchasing is timely delivery. If supplies and equipment are delayed, the project may not be completed on time, which might lead to lower sales, a halt in production, and unhappy clients (Aberu, 2017).

Therefore, the procurement system has to guarantee that the items are adequately dispersed to healthcare institutions where they are required and that the essential supplies are provided in a timely way to central or regional shops (Kuyawo, 2019).

Gizaw (2017) reported that longer delivery time for requested goods in Addis Ababa university is associated with delay in getting foreign currency from banks, late release of documents by Ethiopian Shipping and Logistics Service Enterprise to release the goods and problem from end users side in preparation of well-organized and up-to-date procurement specification.

2.2.1.3. Quality

Quality performance is an integral part of a robust procurement system, emphasizing the importance of not only obtaining goods and services at the right cost but also ensuring that they meet the required standards, ethical considerations and legal requirements. Continuous monitoring, feedback mechanisms and improvement initiatives contribute to enhancing the overall quality of procurement processes (Mason, 2018).

Moges (2020) states that there are counterfeit and inferior products on the market, posing a serious risk to the supply chain's ability to provide high-quality products. Public sector procurement procedures and national regulatory bodies need to put in place suitable quality assurance measures to make sure that only high-quality goods enter the supply chain in order to mitigate this risk. This duty is handled by procurement through the technical specifications that are provided with the bidding document. These specifications list important requirements for the quality of the product, including those related to product certification, pharmacopeia standards (if applicable), labeling and packaging, shelf life, etc. When a contract is awarded, the supplier is bound by these requirements as part of the contract. It is imperative that the bidding and contract documents grant the right to perform inspections and tests prior to or after shipment in order to verify that the product.

2.2.2. Determinants of Public Pharmaceutical Performance

Different scholars identified various determinants for procurement performance of an organization. A study conducted by Tesfay (2020) used adherence to policies and procedures, right quantity, right quality, right time, staff competency as determinants of procurement performance of Addis Pharmaceutical Factory. Likewise, Berhie (2017) identified procurement lead time, ethical practice, employee training, record management & ICT as factors of good procurement practice in Ethiopia pharmaceutical supply chain.

According to Kakwezi & Nyeko (2019) non-financial measures like safety of employee, cycle time and quality of goods and services and financial measures such as cost accounting, profit center and budgetary control were used factors affecting performance of the procurement function in Uganda.

Masemola (2022) identified other factors as a determinants of procurement performance than Tesfay (2020) and Kakwezi & Nyeko (2019). In his study, Masemola used Supplier selection and supplier risk management as drivers of procurement performance in in the public health industry. The findings of this study revealed that supplier risk management had a weak and insignificant relationship with procurement performance.

For the purposes of my study, considering rationale under problem of statement and the practice of pharmaceutical procurement in EPSS below are the most important and impactful determinants of procurement performance to be investigated.

2.2.2.1. Procurement planning

The effectiveness of public procurement is greatly impacted by procurement planning, a strategic function (Changalima *et al*., 2021). This study found that the effectiveness of public procurement is influenced by procurement planning, which includes having a sufficient budget, adhering to procurement rules and regulations, including users as stakeholders, and putting prepared procurement plans into action.

Procurement planning is a basic and crucial task within the procurement process, according to a wealth of literature. Planning for procurement effectively has the power to boost performance and make a major contribution to the success of operations. The first phase of the public procurement cycle is known as planning. In order to precisely identify the items or services that need to be purchased, procuring authorities are required to carry out a thorough requirements assessment during this phase. They also have the responsibility of creating a bid strategy, which entails budget planning and development. Furthermore, the procurement strategy used at this stage has a big impact on the steps that follow. The foundation for an organized and successful procurement process is laid by this early preparation, which is essential (Transparency International, 2015)

Improving procurement planning is essential to minimize low-value repetitive purchases, enhance the benefits of economies of scale, and reduce transaction and transport costs. The capacity to plan procurement needs further development to optimize the utilization of internal procurement staff and strengthen suppliers' capacity to deliver effectively (WHO, 2015). Procurement planning plays a crucial role in enhancing the performance of suppliers in service delivery. Specifically, it contributes to the enhancement of value for money and quality. The planning process ensures that procurement activities are strategically aligned with the goals of obtaining the best value for resources expended and it also facilitates measures to ensure the quality of goods or services acquired. This strategic approach to procurement planning contributes to overall efficiency and effectiveness in supplier performance (Chepkesis and Keitany, 2018).

The Ethiopian Federal Government, through the Procurement and Property Administration Proclamation No. 649/2009, mandates public bodies to establish and prepare an annual procurement plan. This plan is required to outline the procurement activities intended for the respective budget year. Furthermore, the Federal Government's public procurement directive, issued by the Ministry of Finance, stipulates that public bodies must establish a timetable for the main activities within the procurement process using formal formats. These regulatory measures aim to ensure transparency, accountability, and effective planning in the procurement activities of public entities in Ethiopia (FDRE, 2009 & MOFED, 2010).

According to Oenga *et al.* (2022) for organizations to be successful in their procurement processes, they must create and adhere to procurement plans. In order to improve the procurement process in terms of lower costs, shorter lead times and higher-quality goods and services received by an organization, the procurement plans and procedures established by the procuring entity must be put into practice. As noted by Joseph (2016), the consequences of inadequate planning include price variations, late delivery of items, and the provision of poor-quality goods and services. These issues can lead to increased costs, disruptions in the supply chain, and a diminished ability to meet the intended goals of the procurement process.

2.2.2.2. Procurement rules and regulations

The public procurement rules and regulations have a critical role in shaping the institutional framework within which procurement professionals and program managers operate. These rules

and regulations, established by policy makers and management executives, form the basis for implementing authorized and funded procurement programs or projects. The effectiveness of a public procurement system is closely tied to the presence and robustness of these legal and regulatory frameworks. Procurement rules and regulations are described as prerequisites for a sound public procurement system, influencing the efficiency or inefficiency of the procurement process. They serve as governing principles for acquiring goods and services necessary for the effective functioning of an organization. This legal and regulatory foundation provides the structure and guidance needed to ensure transparency, accountability and fairness in procurement activities (George & Lucy, 2016). However, in the context of developing countries, the institutionalization of public procurement rules and regulations appears to be troubled by pervasive challenges.

In Ethiopia, the public procurement of federal institutions is regulated by Federal Public Procurement and Property Authority. The governing legal frameworks are Public Procurement Proclamation No 649/2009, public procurement directive, procurement manual, standard tender documents (STD) and guidelines.

Another study conducted by Damte (2018) at the Agricultural Transformation Agency of Ethiopia (ATA) reveals significant challenges in the procurement processes of the Agency. The identified problems primarily stem from regulatory issues, specifically long and strict government rules and processes that impede efficient service delivery. This suggests that the existing regulatory framework may contribute to delays and inefficiencies in procurement within the agency. Furthermore, the study points out that the public procurement legal framework provides excess control and authority to the Federal Public Procurement and Property Authority (FPPA).

2.2.2.3. Employee competency

Competency refers to the possession of adequate knowledge and skills that empower an individual to effectively perform tasks and make informed decisions across a range of situations. It goes beyond mere theoretical understanding and extends to the practical application of knowledge and skills in real-world scenarios (Aketch & Karanja, 2013).

Many organizations lack staff with the right competence critical to good procurement process management highlights a common challenge in various sectors. In line with this, the

comprehensive market shortcomings assessment conducted by EPSA (2021) showed that there was a competency gap of tender management directorate staff to handle the procurement operations.

Public procurement directive states that the head of public bodies is responsible to ensure that procurement staff and the head of the procurement unit have the required educational qualifications and relevant experience is crucial for the effective functioning of the procurement process (MOFED, 2010). Continuous education, training and professional development are critical components of maintaining and enhancing procurement professionalism. Hence, competence plays a crucial role in ensuring that the benefits of new products and services are effectively communicated and utilized within an organization (Hamza *et al*, 2016).

2.2.2.4. ICT utilization

The use of Information and Communication Technology (ICT) in modern governments indeed offers numerous benefits and addresses various operational challenges. By harnessing the capabilities of ICT, modern governments can create more responsive, efficient and citizen-friendly systems, contributing to overall economic development and improved governance (Kabubu, 2016). ICT plays a crucial role in enhancing the efficiency and effectiveness of the procurement process in businesses. By leveraging ICT effectively, businesses can transform their procurement processes, making them more agile, transparent, and aligned with organizational goals (Scarsi, 2016).

As per the study of Omanji (2018), the coordination of business processes within an organization and between a buyer and their current suppliers is facilitated by the use of ICT in procurement. Examples include electronic purchase order systems, online catalogs, and links to supplier websites for information sharing regarding fulfillment operations.

2.2.3. Relationship between Determinants of Public Pharmaceutical Procurement and Procurement Performance

The proper implementation of procurement plan improved the procurement process in terms of lower costs, shorter lead times, and higher-quality goods and services received by an organization as per the study conducted by Oenga *et al*. (2022).

A study conducted in Tanzania reported that adherence to with rules and regulations has a significant impact on procurement performance in public entities (Mrope *et al*., 2017). The government's laws, regulations, and directives must be followed by government employees in order for the procurement system to continue operating efficiently.

According to Kibret (2018) procurement staff competency has significant effect on pharmaceutical procurement performance. Similarly, a study conducted by Muya *et al.* (2019) reveled that employee competence is one of the main elements influencing an organization's success or failure is employee competence. When an organization has a workforce that is highly competent, it indicates that they have the fundamental abilities, know-how and competency needed to carry out organizational procurement tasks and thereby increase the function's efficacy. The study concludes that having knowledgeable, experienced procurement staff would improve procurement performance across the board for the organization. Hence, a robust procurement system ought to have a skilled and knowledgeable workforce of professionals with the necessary knowledge and abilities for specific procurement roles.

Studies show that IT solutions and e-commerce technologies affect procurement related activities. Most businesses have been successful in lowering purchase costs, shortening lead times, lowering the number of suppliers and increasing the quantity of goods provided by their main suppliers, savings as well as a decline in the price of the goods bought (Mirkena *et al*, 2021).

The primary procurement performance criteria: quality, cost and time have a big influence on the procurement process. In developing countries like Ethiopia, the procurement function plays a significant role in service delivery, accounting for a sizeable amount of overall costs. Obtaining the best value for money in procurement requires procurement performance because of the huge amounts at stake (Gebreab, 2022). Therefore, in order to improve procurement performance, the procuring organization uses a range of strategies, such as procurement planning, following procurement rules and regulations, improving staff competency, and maximizing ICT use.

2.2.4. Theoretical framework

Theories are developed to elucidate, forecast and comprehend phenomena. In many instances, they are crafted to challenge and expand existing knowledge within the confines of critical assumptions. The theoretical framework serves as an introduction and description of the theory that elucidates why the researched problem exists. It comprises concepts, along with their definitions and incorporates existing theories that are applied to the study, providing a structured foundation for understanding and interpreting the research problem (Sacred Heart University Library, 2020). In this specific study, the employed theories are briefly described as follows.

2.2.4.1. Agency Theory

According to Xingxing (2012), agency relationships revolve around two parties. When these parties collaborate and form an association in which one (the principal) delegates tasks to another (an agent) to execute on its behalf, they are considered to be in an agency relationship. The key principles of agency theory encompass the following: agents tend to be more risk-averse than principals; goal conflicts may arise between principals and agents; each party acts in its own self-interest; information asymmetry is common between principals and agents; and efficiency serves as the criteria for effectiveness.

These principles can give rise to two significant challenges in agency relationships: an agency issue and a problem with risk-sharing (Xingxing, 2012). An agency problem arises when the goals of agents diverge from those of principals and it becomes difficult or costly to verify whether agents have correctly carried out assigned tasks (i.e., moral hazard). This problem also surfaces when confirming that agents are qualified to perform assigned tasks is challenging or costly (i.e., adverse selection). Conflicting perspectives on risk between principals and agents can lead to disputes over the appropriate course of action (Xingxing, 2012).

The challenges in supply chain quality management align with the assumptions and recommendations of agency theory. Managing supplier quality poses difficulties for buyers engaged in agency relationships. Customers expect suppliers to consistently deliver high-quality goods and services and to continually improve them. However, suppliers may be reluctant to make substantial investments in quality, particularly if they perceive that only customers benefit.

Due to the divergent interests of buyers and providers, each party tends to prioritize its own concerns (Xingxing, 2012).

In the context of public procurement performance, the Agency theory helps to understand how the design of procurement processes, institutional arrangements, incentives, and accountability mechanisms influence the behavior and performance of procurement agents. It provides insights into issues such as contract design, vendor selection, monitoring and evaluation, and the role of regulations and oversight mechanisms in improving procurement outcomes. Therefore, the study utilizes this theory to assess how procurement regulations impact the effective implementation of procurement performance in the EPSS.

2.2.4.2. Transaction Cost Theory

Oliver Williamson introduced the transaction cost theory in 1979. According to Williamson's view of transaction cost theory, the primary objective of an organization is to reduce overall transaction costs associated with pharmaceutical transactions. This theory addresses questions related to how an organization defines its boundaries, how it should manage its operations, and the fundamental reasons for its existence. Additionally, transaction cost theory suggests that hierarchical organizations, such as firms, may allocate resources more efficiently than a system characterized by constrained bargaining, such as a market.

In the context of managing public tenders to procure pharmaceutical, transaction cost theory suggests that there are associated costs. According to this theory, a procuring body should strive to reduce the costs incurred when awarding a contract to a supplier who, after executing each tender process, may return. This reduction in costs can be achieved by improving activities such as procurement planning and tender evaluations. The idea is to enhance efficiency and minimize transaction costs throughout the procurement process.

Therefore, this theory is relevant to the study as it delineates the conditions required for a business to manage pharmaceutical procurement through economic transactions externally and the circumstances in which it should handle an economic transaction internally.

2.2.4.3. The Knowledge-Based Theory

The knowledge-based view of the firm considers knowledge as its most strategically significant resource. Advocates of this view argue that knowledge-based resources, being challenging to

imitate and socially complex, are fundamental determinants of sustained competitive advantage and improved corporate performance. The diverse knowledge bases and capacities among firms are considered crucial in this perspective. Various entities, including organizational culture, identity, policies, procedures, documents, systems, and individuals, are utilized to communicate and embed knowledge.

The knowledge-based paradigm asserts that employee training significantly influences an organization's human resources capacities. The presence of numerous employees with advanced degrees and professionally educated personnel in the procurement department substantially enhances the organization's ability to attract and retain skilled workers. Consequently, the study employed this theory to examine how a company educates its staff to enable them to support the efficient implementation of procurement processes (Oliveira, 2011). The study used this model to assess the impact of training on effective pharmaceutical procurement performance in the EPSS.

2.2.4.4. Technology, Organization and Environment Model (TOE)

According to Oliveira (2011), the TOE framework, initially developed by Tornatzky and Fleischer in 1990, delineates three crucial factors within an entrepreneurial environment that impact the adoption and utilization of technological innovations. These factors are the technical environment, environmental context and organizational context.

The term technical environment encompasses both internal and external technologies relevant to the organization. This includes the spectrum of available technologies outside the company, as well as the existing procedures and tools employed within the organization. The term organizational context pertains to the organization's characteristics, such as its size, scope and organizational structure. It considers how these factors influence the adoption and implementation of technology.

Furthermore, the environment in which a company operates, including its sector, market, competitors and interactions with the government, is an essential aspect of the TOE framework (Oliveira, 2011). The framework provides a comprehensive perspective on the interplay of technological, organizational and environmental factors in influencing the adoption and success of technological innovations within a given entrepreneurial context.

The TOE (Technological, Organizational and Environmental) framework serves as a practical analytical tool for examining the acceptance and assimilation of various IT innovations. Initially introduced and subsequently modified in studies on IT adoption, the TOE framework has proven effective in understanding the dynamics of technology adoption. While specific elements within the three contexts (technological, organizational and environmental) may vary across different research studies, the TOE framework boasts a robust theoretical foundation, consistent empirical evidence, and applicability across various domains of information systems innovation.

Technological innovation, according to the TOE framework, impacts the utilization of ICT-based procurement systems in three dimensions: technological, organizational and environmental. These dimensions play a crucial role in determining the level of automation, the specific procurement systems adopted by institutions, the nature of the ICT infrastructure, and the manner in which e-procurement is utilized within organizations (Oliveira, 2011). Consequently, this theory was employed in the study to assess how utilization of ICT can influence the effective implementation of pharmaceutical procurement performance in the EPSS.

In general, each of these theories offers unique insights into different aspects of procurement performance, such as transaction costs, knowledge-based view and technological uses, which can complement the understanding provided by the Agency Theory. Therefore, the study grounds on Agency theory.

2.3 Empirical Review

2.3.1 The role of procurement planning in determining the public pharmaceutical procurement performance.

Procurement planning includes identifying the goods or services to be procured, determining how best to meet the needs of the organization, determining the scope of goods or services required, selecting the best procurement strategies or methods, setting deadlines, and taking responsibility for the entire procurement process (Onyango, 2014). According to this study, improper procurement planning is the cause of poor procurement performance.

Likewise, Shunka (2016) stated that the identification of user departments' needs and gaps by the procurement units is a problem in the practice of procurement planning. In addition, the procurement plan is not used as a monitoring tool and is not updated to reflect organizational

conditions such as changes in priority, institutional capacity to handle the procurement process and time estimates.

A study conducted by Mirkena *et al.* (2021) revealed that inadequate planning for the procurement process, unethical practices, procurement policy and improper quantification of required products are factors that hampered the delivery of health commodities to health institutions in Ethiopia.

According to Evans (2016) procurement planning ensures that clients receive the proper services and minimizes disputes during various phases of the purchasing evaluation process, that fraud impedes the procurement department's ability to operate at its best, and that the aggregate of procurement affects the performance of procurement functions.

A study conducted at the University of Nairobi identified several key challenges in procurement. Some of the highlighted issues included inadequate planning, the complexity of regulations imposed by the public procurement act, high procurement costs, and interference by higher management in the procurement processes (Pereruan, 2016). These challenges can significantly impact the efficiency and effectiveness of the procurement activities within the university.

Hypothesis 1. Procurement planning significantly and positively affects the pharmaceutical procurement performance of EPSS.

2.3.2. The role of procurement rules and regulations in determining the public pharmaceutical procurement performance.

Public procurement regulations are rules and guidelines for managing procurement process in procuring entities (Gikonyo, 2014). Operational research conducted by Negash *et al.* (2019) at EPSA revealed that public procurement proclamation and directive do not consider the special nature of pharmaceutical. The authors argued that pharmaceutical products were treated as common user items during the promulgation of this laws. As an example, they mentioned that the threshold set for procurement methods such as restricted tenders, request for quotation (RFQ), and National Competitive Bidding (NCB) tenders is considered very low. This low threshold may have implications for the procurement process, potentially impacting the scale, complexity or competitiveness of the bids received. It may restrict the use of these methods for pharmaceutical products. In addition, bid security 0.5-2% of the bid amount should be secured by

the supplier is another challenge that may discourage suppliers from participating in pharmaceutical tenders as per the authors. This could limit the pool of potential bidders and affect competition in the procurement process.

A study conducted by Nigussie (2015) mentioned that insufficient rules, regulations and is the lack of comprehensive procurement policy are among the main obstacles to develop for establishing effective pharmaceutical procurement practice.

Another study conducted on the Procurement Legislation and Performance of Constituency Development Fund (CDF) committees in Kenya indicated a statistically significant correlation between procurement legislation and procurement performance (Muange and Chirchir, 2016). This study promoted the adoption of strong and transparent procurement rules to ensure appropriate procurement management and underlined the critical role that effective legislation plays in enhancing the performance of CDF committees.

Hypothesis 2. Procurement rules and regulations significantly and positively affect the pharmaceutical procurement performance of EPSS.

2.3.3. The role of employee competency in determining the public pharmaceutical procurement performance

A competent professional workforce with the necessary knowledge and skills for specific procurement jobs should be part of any well-functioning procurement system. According to George and Lucy (2016), employee training levels have a significant impact on how well procurement processes within an organization are carried out. Therefore, in order to recruit, develop and retain talent, governmental organizations must have a thorough training program, a strategic workforce plan that includes a staff profile and projects staffing needs for the future (George & Lucy, 2016).

Similarly Ethiopian public procurement directive states that the head of public bodies is responsible to ensure that procurement staff and the head of the procurement unit have the required educational qualifications and relevant experience is crucial for the effective functioning of the procurement process (MOFED, 2010).

According to a study by Mirkena *et al*. (2021), there is a shortage of skilled and experienced workers. The top management should create a system for luring in new qualified workers and

keeping the ones they already have. The upper management should also devise a system to encourage qualified employees by implementing various motivators, such as rewarding and recognizing effective staff members, while ensuring that deliberate inefficiencies would result in significant consequences.

Continuous education, training and professional development are critical components of maintaining and enhancing procurement professionalism. Hence, competence plays a crucial role in ensuring that the benefits of new products and services are effectively communicated and utilized within an organization (Hamza *et al*, 2016).

Hypothesis 3. Employee competency significantly and positively affects the pharmaceutical procurement performance of EPSS.

2.3.4. The role of ICT utilization in determining the public pharmaceutical procurement performance

Technological developments have resulted in the use of IT systems by commercial organizations during the procurement process. This allows for the simplification and automation of their purchasing and other processes. IT systems have been recognized by the competitive current environment as a means of enhancing the procurement process. It is important to note that the transactional and communicational aspects of the procurement processes are guaranteed by an electronic commerce solution. Studies show that IT solutions and e-commerce technologies affect procurement-related activities. Most companies have been successful in lowering purchase costs, shortening lead times, lowering the number of suppliers, increasing the quantity of goods provided by their main suppliers and savings as well as a decline in the price of the goods bought (Mirkena, *et al.,* 2021).

Using ICT effectively contributes significantly to efficient procurement performance. One of the problems with procurement performance in the public procurement and property disposal service is the underutilization of advanced technology, such as e-procurement technology (Ayenachew, 2016).

The study conducted by Zai in 2021 on obstacles affecting Kenya's public procurement performance highlighted several key factors impacting the procurement process. Specifically, the study identified the procurement process itself, ICT adoption, ethics, and supplier relationship

management as crucial determinants of public procurement performance. The conclusion drawn from the study emphasized the need for reforms, suggesting that improving public procurement performance in Kenya necessitates a review of existing laws to support extensive technology adoption in procurement management, the promotion of long-term relationships between buyers and suppliers, and stakeholder involvement through training and awareness campaigns on ethical procurement practices.

Mabhodha and Choga (2021) carried out research to examine the effect of information and communication technology (ICT) on procurement procedures. ICT infrastructure with procurement applications is available and in place, but its utilization is rather poor, as demonstrated by the case of Zimbabwean Urban Councils. The acceptance and deployment of ICT in procurement was driven by both organizational and individual aims. Using the premise that the Technology Acceptance Model serves as the foundation for technology adoption, this study examined participants' opinions regarding the utility and usability of ICT. The study concludes that integrating ICT into procurement improves other business processes and expedites the process. Important success criteria for the adoption and improved use of ICT in procurement were found to include organizational leadership commitment, financial resources, and ICT training and development.

Hypothesis 4. ICT utilization significantly and positively affects the pharmaceutical procurement performance of EPSS.

2.4 Conceptual framework

A conceptual framework is a collection of interconnected ideas or concepts that outline how a particular phenomenon functions and how it is interrelated with its individual elements. In the context of the study, the conceptual framework is applied to investigate the connections between independent variables and a dependent variable. In this study, procurement planning, procurement rules and regulations, employee competency and ICT utilization are identified as independent variables and procurement performance is recognized as the dependent variable, indicating that it is influenced by the variations in the independent variables as per the literatures mentioned above and statement of the problem.

The researcher formulated the below diagram to describe the relationship between the independent variables and dependent variable.

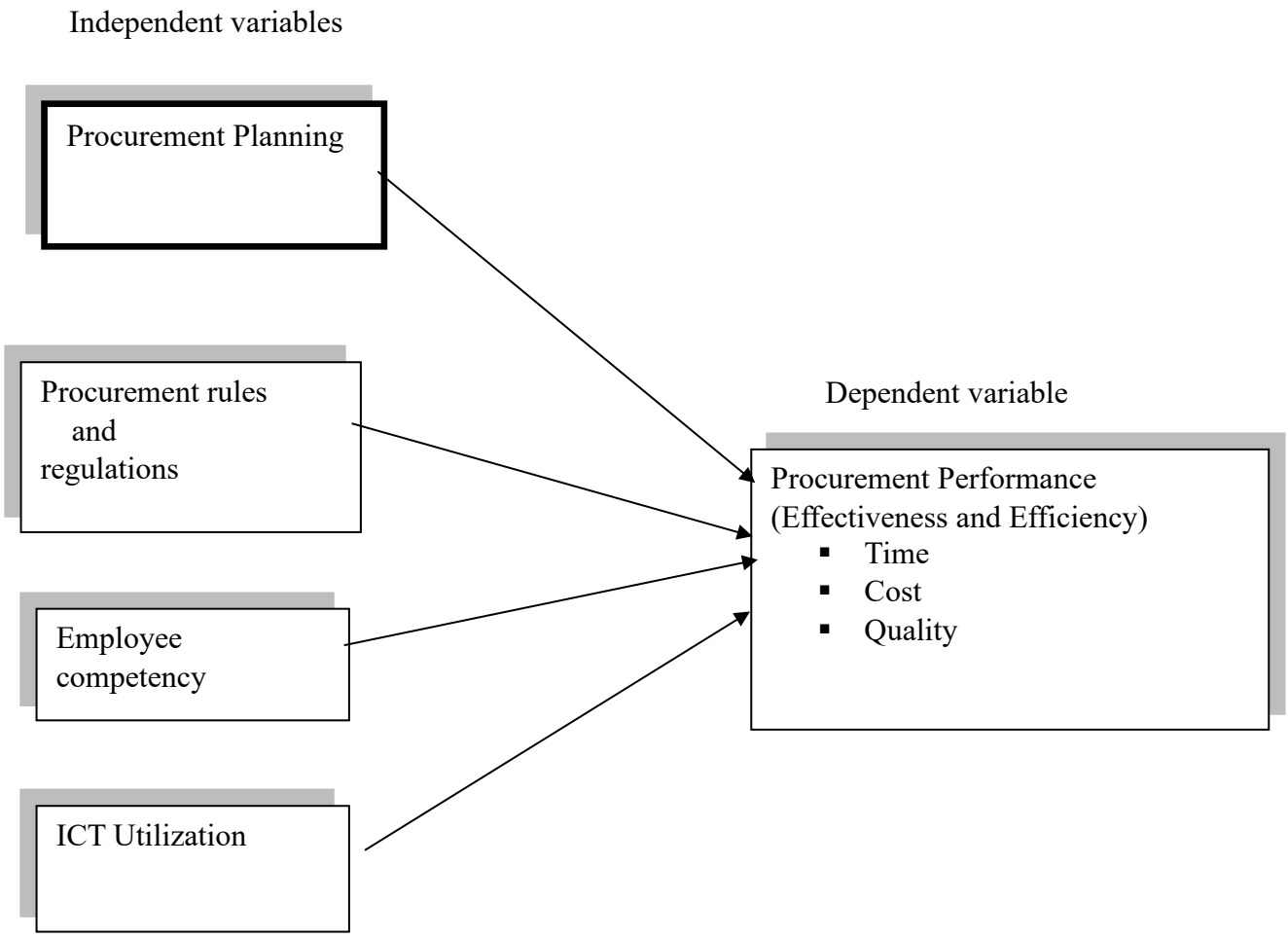

Figure 1.1: Conceptual framework of the study.

Source: Own source developed by the researcher from reviewed literature (Ararsa,2020; Muya et al. 2019; Mirkena et al, 2021)

2.5 Hypothesis Summary

Based on the above literature review, here are the summary of hypothesis drawn for this study.

Hypothesis 1. Procurement planning significantly and positively affects the pharmaceutical procurement performance of EPSS.

Hypothesis 2. Procurement rules and regulations significantly and positively affect the pharmaceutical procurement performance of EPSS.

Hypothesis 3. Employee competency significantly and positively affects the pharmaceutical procurement performance of EPSS.

Hypothesis 4. ICT utilization significantly and positively affects the pharmaceutical procurement performance of EPSS.

2.6 Identified Literature Gaps

Though numerous studies on the performance of public procurement have been conducted, the studies have not sufficiently addressed and investigated the determinants influencing public pharmaceutical procurement performance within the Ethiopian pharmaceutical supply chain, leading to knowledge gap (Kibret, 2018 & Ararsa, 2020). Furthermore, most studies conducted in other countries with varying contexts of demographics, economic, political and environmental factors and institutional settings than Ethiopian Pharmaceutical Supply Service. Hence their findings couldn't be generalized to the Ethiopian Pharmaceutical Supply Service as subject of the study. This study aimed to fill this research gap by assessing the determinants of public pharmaceutical procurement performance in EPSS. Addressing these potential literature gaps could contribute to advancing knowledge in the field of public pharmaceutical procurement and inform the development of evidence-based policies aimed at improving public procurement performance.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter focuses on the overall research procedures used to collect pertinent data in order to meet the study's objectives. It includes description of study area, research approach, research design, population and sampling, sources of data, data collection procedure, data analysis, validity, reliability and ethical considerations.

3.1. Description of the study area

Ethiopian Pharmaceutical Supply Service formerly previously known as EPSA is a Ministry of Health-affiliated public organization that was founded to provide Ethiopian public health institutions with crucial and essential pharmaceutical at a sustainable, cost-effective price. With its main office located in Addis Ababa, EPSS sources products from both domestic and foreign producers and suppliers. It then uses its 19 hubs, which are spread throughout several cities, to distribute its products to more over 4000 healthcare institutions.

EPSS is structured by One director general, three deputy director generals (finance and system strengthening, inbound and outbound wings), twenty directorates at head office, and nineteen branches around the nation. Taking into consideration the numerous factors that have changed since its founding at the start of the new millennium, the Head Office has reformed itself to better represent the current condition of events in the nation. With twenty directorates at the main office, it can manage the country's massive population growth and the resulting surge in the need for pharmaceutical. The Head Office oversees the coordination of the activities of the nineteen branches and the seven clusters that house them.

3.2. Research Approach

In this study, mixed approach was deployed to address the research questions. Because mixed research is beneficial for capturing the best aspects of both qualitative and quantitative data, the researcher also thoroughly examined EPSS pharmaceutical procurement performance.

A self-developed questionnaire was the main method used to gather the primary quantitative data, and open-ended questions were used to gather the primary qualitative data.

3.3. Research Design

Research design refers to the overall strategy a researcher uses to outline the procedures for conducting a research study. It guides the researcher in collecting, analyzing and interpreting data (Indu & Vidhukumar, 2019).

To examine and explain the effects of various determinants on public pharmaceutical procurement performance in Ethiopian Pharmaceutical Supply Service, the researcher employed an explanatory and descriptive study design. The features of independent variables, such as procurement planning, procurement rules and regulations, employee competency and ICT utilization, were described using the descriptive design. This helped gather information on the present status of the phenomena, especially when it came to describing the condition of the dependent variable of the study, the performance of public pharmaceutical procurement. The explanatory research design analyses the cause-effect relationship between dependent (procurement performance of pharmaceutical) and independent variables (procurement planning, procurement rules and regulations, employee competency and ICT utilization).

3.4 Population

3.4.1 Target Population

Target population refers to the complete set of elements from which the researcher aims to draw conclusions. The target population for this study was the staff working on EPSS procurement process. These include all technical staff (officers, team leaders, technical advisors and directors) working in quantification and market shaping, tender management and contract management directorates of EPSS.

As the target population, a total of 80 employees across three directorates that deemed suitable candidates to elucidate and clarify the determinants of public pharmaceutical procurement performance were included. Due to the limited sample size, the study used a census population to provide the necessary and pertinent information for the data analysis.

3.5. Sources of Data

3.5.1. Primary source

The collection of primary data involved obtaining information from key respondents such as the directors, technical advisors, team leaders and officers who are directly or indirectly involved in the pharmaceutical procurement process of EPSS. This was conducted through the use of structured questionnaires.

3.5.2. Secondary source

In this specific study, secondary sources of data encompass various documents, including the strategic documents of EPSS, journals, Standard Operating Procedures (SOPs), manuals, reports, bidding documents, contract agreements, and any other relevant documents encountered during the data collection process. These documents were assumed to be valuable in enhancing the richness of the research.

3.6 Data Collection Procedures

The research instrument was meticulously designed to ensure clarity and eliminate any ambiguity, aligning with the specified objectives of the study. Initially, the selected participants were approached to seek their consent before commencing the data collection process. Once the willingness of participants is confirmed, a well-prepared, self-administered, structured questionnaire was distributed to each respondent. After few days, questionnaires were gathered, and participants were thanked for giving up their valuable time and for participating. Prior to beginning the analysis, primary data was obtained from the study's subject and subsequently validated for consistency and completeness.

3.7 Data Analysis

The collected data went through initial check to identify and rectify any errors, thereby ensuring consistency and completeness. Once the data is checked, the Statistical Package for Social Science (SPSS) version 26 was employed for coding, analysis, and presentation of the collected and cleaned data. The demographic profile of the respondents was summarized using percentage and frequency tables. Descriptive statistics, including mean and standard deviation, to present information numerically and graphically in order to get a broad view of the data that was gathered. Additionally, inferential statistics such as Pearson's correlation and multiple regressions

which includes ANOVA and summary model were utilized to analyze both associations and effects of independent variables on procurement performance.

Thematic content analysis was utilized to analyze the qualitative data. Based on the study questions, themes were determined, and key informant answers were compiled in relation to the themes found. To aid in interpretation, the results of surveys that were both quantitative and qualitative were examined concurrently.

3. 8 Validity and reliability

3.8.1. Validity

The data collection tool went through a pilot phase with a subset of respondents to validate the questionnaires. This process involved assessing the clarity, validity, ambiguity, and readability of the statements and questions. Discussions with senior procurement experts who were experienced on EPSS procurement process helped to determine the questionnaire's content validity. Following a pilot test, the questionnaire was revised with the insightful feedback these experts provided after reviewing the content validity scales. To improve the overall validity of the instrument, some items were added, removed, or reworded from the original draft.

3.8.2. Reliability

Data collectors were trained on the tools and procedures used in data collection. In order to address any discrepancies in the data, the investigator oversaw the data collection procedure and reviewed the completed questionnaires. The Cronbach's test was used to make sure the instrument was reliable. The range of Cronbach's alpha measure is between 0 and 1. Hair *et al*. (2016) state that Cronbach's alpha values that are less than 0.6 are poor, those that are above 0.7 are acceptable, and those that are over 0.8 are very good. This test evaluates the internal consistency of the questionnaire items, giving the data collection tool a reliability score.

Accordingly, the reliability analysis for the dependent and independent variables is captioned in the below table.

Table 3.1: Reliability Test Results

No	Variables	Number of items	Cronbach’s alpha
1	Procurement planning	6	0.707
2	Procurement rules and regulations	5	0.820
3	Employee competency	5	0.768

4	ICT utilization	5	0.733
5	Procurement performance	7	0.785

Source: SPSS own survey (2024)

The results showed that all of the variables' Cronbach's Alpha values were over 0.70, as can be seen in the table above. As a result, each variable has an adequate level of internal consistency and reliability.

3.9 Ethical Consideration

Before initiating data collection, an official letter was written to EPSS from School of Commerce to get authorization request to conduct the research. Prior to distributing the research instrument, explicit permission was sought from all participants, who were then enrolled as respondents in the study. Throughout the data collection process, data collectors provided a clear explanation of the study's goals, scope, and intended outcomes to the respondents. All information obtained from participants treated ethically, maintaining the integrity of their initial concerns, and kept confidential. Respondents had received assurance that any data collected during the study was treated with utmost privacy. In order to protect the anonymity of respondents, no individual was identified in any reports based on their responses.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the data that was collected and discusses the findings in light of the research objectives and hypothesis of the study. Every data set was primary data obtained from staff members who directly and indirectly participated in the EPSS procurement process and working in tender management, contract management and quantification and market shaping directorates. Each item and variable in the collected data was represented by data coding in order to turn it into a numerical representation. As a result, following the completion of the data coding, tables, frequency distributions, and percentages were used to analyze, discuss, and present the findings. The respondents' socio-demographic data is displayed in the first section of the questionnaires. Whereas the second section includes an assessment of the determinants of pharmaceutical procurement performance of EPSS, and the final section presents the regression and correlation analysis between independent and dependent variables. Analysis of the collected data was conducted by using Statistical Package for Social Science (SPSS) version 26. The results of the data analysis are presented as follows.

4.2 Response Rate

The respondents' desire to engage in the survey is shown by the response rate. According to Holtom *et al*. (2022), a response rate of more than 68% helps collect enough data to be able to generalize the opinions of respondents about the research problem in the target population. For the purpose of this study, a total of 80 questionnaires were distributed to the respondents from EPSS. Seventy-six questionnaires that were provided were returned and filled out by the participants. 4 questionnaires were not returned. A response rate of 95% is used as the basis for the analysis, which is deemed high enough to allow for the formulation of recommendations and conclusions. It should be noted that 5% of the intended respondents declined to take part in the research.

4.3 Socio-demographic Characteristics of the Respondents

The table below shows the results of the socio-demographic information that the respondents were asked to provide. This information included gender, age, educational background, profession, working directorate, year of experience, and job position.

Table 4. 1: Socio-demographic information of respondents

Socio-demographic character		Frequency	Percent (%)
Gender	Male	60	78.9
	Female	16	21.1
Age	21-30	19	25.0
	31-40	47	61.8
	41-50	8	10.5
	Above 50	2	2.6
Level of Education	Diploma	0	0
	Degree	31	40.8
	Master	45	59.2
	PhD	0	0
Profession	Pharmacy	47	61.8
	Laboratory technology	13	17.1
	Biomedical engineering	11	14.5
	Accounting and finance	1	1.3
	Management	4	5.3
Work Experience	Below 3 years	14	18.4
	3-6 years	20	26.3
	7-10 years	27	35.5
	Above 10 years	15	19.7
Working Directorate	Tender management	26	34.2
	Contract management	28	36.8
	Quantification and market shaping	22	28.9
Job position	Director	2	2.6
	Team leader	16	21.1
	Officer	44	57.9
	Technical advisor	14	18.4

Source: SPSS own survey (2024)

As it can be seen in the above table, 78.9% of the respondents were male and the rest 21.1% were female. The results show that both men and women took part in this investigation. The

percentage of male respondents was, however, noticeably larger than the percentage of female respondents.

Out of all the responses, age groups comprised of those between 31 and 40 years old accounted for 47 (61.8%), those under 31 years old for 19 (25%), those between 41 and 50 years old for 8 (10.5%) and those over 50 years old for 2 (2.6%). Thus, the findings indicate that the majority of the responders were young workers at EPSS.

Despite the fact that the questionnaire asked about educational level for both diploma and Ph.D. levels, no respondent was used in this study. However, the majority of responses 45(59.2%) came from people who had completed their master's degree, whereas 31(40.8%) had first degree. This suggests that the respondents have first degree and above educational level that enable them to comprehend and complete the survey.

Respondents with 7 to 10 years of organizational experience made up 27 (35.5%) of the responses, dominating the other categories. Those with 3 to 6 years of experience came in second with 20 (26.3%), those with more than 10 years of experience with 15 (19.7%) of the responses and those with less than 3 years with 14 (18.4%). This indicated that 55.2% of the respondents had been employed by the EPSS for seven years or longer, indicating that they could provide accurate information regarding the study.

Respondents were asked to indicate the current EPSS directorate they are working for. Accordingly, 36.8% were employed by the contract management and 34.2% in tender management directorates. Furthermore, 28.9 % of the participants worked for the Quantification and Market Shaping Directorate. Accordingly, the participants appear to be from three important directorates that are engaged in all phases of the procurement process, from procurement planning to contract management. The data's credibility and dependability are increased by the respondents' distribution throughout these directorates, which suggests that they are well-versed in the various facets of procurement process.

4.4 Descriptive Analysis of Determinants of public pharmaceutical procurement performance

In order to examine the determinants of public pharmaceutical procurement performance in Ethiopian Pharmaceutical Supply Service, respondents were requested to rate the current state of procurement performance in EPSS. The Likert scale, which was established to measure the research components, was used to capture the respondents' perceptions along 28 items that corresponded to the five aspects. Five-point Likert scale ranging from strongly disagree to strongly agree (1 denotes Strongly Disagree (SD), 2 Disagree (D), 3 Neutral (N), 4 Agree (A) and 5 Strongly Agree (SA)).

For all the four independent variables that include procurement planning, procurement rules and regulation, employee competency and ICT utilization and also the procurement performance which is the dependent variable, the mean score and standard deviation were computed for elements of each variable. According to Alkharusi (2022), means are interpreted for level of agreement as follows: 1-1.8 very low level of agreement, 1.81-2.61 low level of agreement, 2.62-3.42 moderate level of agreement, 3.43-4.23 high level of agreement and 4.24-5.04 very high level of agreement. The average means and standard deviation result of variables is separately analyzed, presented and interpreted as follows.

4.4.1 Procurement planning

The study aimed to examine the state of procurement planning in the Ethiopian Pharmaceutical Supply Service and, accordingly, its findings are presented here in the table below.

Table 4. 2: Descriptive statistics of procurement planning

Items	N	Mean	Std. Deviation
There is repetitive planning required due to fragmented procurement requests.	76	2.99	1.000
An effective plan helps EPSS to save money.	76	2.78	0.988
EPSS performs its tasks according to the scheduled plan.	76	2.99	1.000
EPSS conducts market assessment prior to the	76	2.99	1.013

procurement plan in order to determine the current product prices.			
EPSS allocates enough time for planning procurements before starting the procurement process.	76	3.01	1.000
EPSS`s plan is implemented in accordance with the budget that has been approved.	76	3.07	1.075
Grand total	**76**	**2.97**	**1.013**

Source: SPSS own survey (2024)

As can be seen from table 4.2 above, the overall mean (M = 2.97) indicated that a moderate level of agreement among respondents with the procurement planning aspect of EPSS.

Additionally, the statement "EPSS's plan is implemented in accordance with the budget that has been approved" has the highest mean value (3.07), showing a comparatively moderate agreement with this aspect of procurement planning.

In general, responses were more variable for procurement planning practice of EPSS, as the descriptive statistics showed, with a high standard deviation spread with a range of 0.988 to 1.075 and these results supported the findings of Gebreab (2022).

4.4.2 Procurement rules and regulations

The study aimed to assess the role of public procurement rules and regulation on the procurement performance of Ethiopian Pharmaceutical Supply Service and, accordingly, its findings are presented here in the table below.

Table 4. 3: Descriptive statistics of procurement rules and regulations

Items	N	Mean	Std. Deviation
The rules and regulations governing public procurement has improved competitiveness of the procurement process.	76	3.05	0.978
The rules and regulations governing public procurement has improved the speed with which EPSS procures pharmaceutical.	76	2.99	0.986
Public procurement rules and regulations have transparent procedures for the procurement pharmaceutical at EPSS.	76	2.78	0.988
There are articles of public procurement rules and regulations hinders the pharmaceutical procurement process at EPSS	76	2.99	1.000

The rules and regulations governing public procurement improves the quality of the pharmaceutical products delivered to EPSS.	76	2.99	0.986
Grand total	**76**	**2.96**	**0.988**

Source: SPSS own survey (2024)

As can be seen from table 4.3 above, the overall mean (M = 2.96) indicated that a moderate level of agreement among respondents about the role of public procurement rules and regulation on the procurement performance of Ethiopian Pharmaceutical Supply Service.

Furthermore, there is comparatively moderate agreement with this component of procurement rules and regulations indicated by the statement "The rules and regulations governing public procurement has improved competitiveness of the procurement process," which has the highest mean value (3.05).

Standard deviations range from 0.978 to 1.000, suggesting moderate to slightly higher variability in responses across the different statements. These results are consistent with those of Kibret (2018), which examined the factors affecting pharmaceutical procurement practices and availability of life-saving pharmaceutical in Ethiopian public health hospitals.

In addition, key respondents were requested to specify if they want to add their opinion regards to procurement rules and regulation in relation to procurement performance of EPSS. Based on this, the insights reflected by the key respondents are summarized as follows.

The distinct characteristics of pharmaceutical are not sufficiently taken into consideration by the current public procurement rules and regulations, which causes inefficiencies and delays in the process. In particular, the procurement of health items is subject to a lack of defined guidelines, which contributes to the process' complexity and length. Moreover, the procurement threshold is not revised on a regular basis.

It is suggested that in order to address these problems, the Ethiopian Pharmaceutical Supply Service (EPSS) create a unique procurement directive that is suited to the pharmaceutical industry and adheres to the fundamentals of public procurement. The goal of this directive is to improve the effectiveness and efficiency of the procurement process by streamlining it.

Reducing lead times throughout the procurement cycle is another area that EPSS needs to concentrate on improving. The timely delivery of high-quality pharmaceutical must not be hampered by procurement rules and regulations, which are necessary to ensure justice and integrity but also need to be balanced with operational efficiency. At the moment, these rules fail to sufficiently take into account the unique characteristics of pharmaceutical, leading to obstacles in procurement and potentially affecting quality.

4.4.3 Employee competency

The study aimed to assess the state of employee competency in Ethiopian Pharmaceutical Supply Service and, accordingly, its findings are presented here in the table below.

Table 4. 4: Descriptive statistics of employee competency

Items	N	Mean	Std. Deviation
The pharmaceutical procurement of EPSS is conducted by trained and experienced employees.	76	3.29	1.030
Employees handling the procurement process have recognized procurement qualifications.	76	2.99	1.000
Employees carrying-out the procurement process are capable of applying public procurement principles, preparing contract and tender documents timely.	76	2.78	0.988
The EPSS procurement team is organized with the appropriate number of employees to handle the procurement of pharmaceutical.	76	2.99	1.013
The EPSS procurement team has the necessary skills and competence to handle complex and strategic procurements.	76	3.07	0.943
Grand total	**76**	**3.02**	**0.995**

Source: SPSS own survey (2024)

An aggregate mean and standard deviation of (M = 3.02, SD = 0.995) indicates that there were experienced and trained staff in EPSS, as the result is displayed in table 4.4 above. The findings further showed that the EPSS procurement team has the necessary skills and competence to handle complex and strategic procurements. These findings are consistent with the study conducted by Baraki (2020) which examined the Determinants of Procurement Performance in Non-governmental organization.

In general, responses were moderately variable with respect to the state employee competency of EPSS, as the descriptive statistics showed, with a high standard deviation spread with a range of 0.943 to 1.030.

In addition, key respondents were requested to specify if they want to add their opinion regards to employee competency in relation to procurement performance of EPSS. Based on this, the insights reflected by the key respondents are summarized as follows.

A comprehensive capacity building program is lacking for the Ethiopian Pharmaceutical Supply Service (EPSS) procurement staff, especially for those newly assigned to procurement roles. These employees are not given timely and consistent procurement training, which makes it difficult for them to perform their jobs well. Legal training is also necessary for EPSS procurement specialists in relation to contract preparation and tendering.

The pharmacy, laboratory, and biomedical engineers that make up the EPSS tender management directorate team are not well-versed in contract administration and procurement. Even though formal training is important, the present strategy mainly focuses on employee informal learning.

In order to address these shortcomings EPSS needs to give top priority to the efficiency of its procurement operations while making sure that value for money is achieved. But the organization's overall efforts to increase its human capital's capacity are insufficient, and neither short-term nor long-term development strategies are not well-defined.

Employee in the procurement department frequently do not receive structured training; instead, they rely on short-term courses like CIPS or ad hoc learning from senior colleagues. To effectively improve employees' abilities and adaptability to the changing needs of the pharmaceutical business, ongoing professional development and training are required.

4.4.4 ICT utilization

The study aimed to assess the state of ICT utilization in Ethiopian Pharmaceutical Supply Service and, accordingly, its findings are presented here in the table below.

Table 4. 5: Descriptive statistics of ICT utilization

Items	N	Mean	Std. Deviation
Information communication technology has supported in reduction of paperwork in EPSS.	76	3.05	0.978
There is an automation system for pharmaceutical procurement in EPSS.	76	2.99	0.986
ICT speeds up the procurement process of EPSS.	76	2.78	0.988
The use of ICT in the EPSS has enabled the provision of real-time information for rapid decision-making.	76	2.99	1.013
ICT is important to improve the quality pharmaceutical delivery in EPSS.	76	3.07	0.943
Grand total	**76**	**2.97**	**0.982**

Source: SPSS own survey (2024)

As it can be shown in table 4.5, respondents, on average, somewhat agreed (Mean = 3.07 and 3.05) ICT is important to improve the quality pharmaceutical delivery in EPSS and Information communication technology has supported in reduction of paperwork in EPSS statement, indicating a slightly stronger agreement. For the rest statements, respondents' perception is slightly lower.

In general, the overall average mean score across all items, which is 2.97, with a standard deviation of 0.982, indicating moderate agreement across all statements with some variability in responses. These findings are consistent with the study conducted by Berhie (2017) which assessed the factors influencing good pharmaceutical procurement practice employee perception.

In addition, key respondents were requested to specify if they want to add their opinion regards to ICT utilization in relation to procurement performance of EPSS. Based on this, the insights reflected by the key respondents are summarized as follows.

The Ethiopian Pharmaceutical Supply Service (EPSS) acknowledges that its ICT initiatives such as ERP and eGP are critical to improving the effectiveness of its supply chain. The procurement and demand planning divisions need more training and awareness regarding eGP, a new application, as the ICT implementation within EPSS is still in its early phases. Even if there are current ICT solutions, many tasks are still done manually, and they are not fully utilized or useful for making decisions.

ERP implementation has the potential to improve the procurement process by getting rid of unnecessary work and minimizing paperwork. The procurement system is being automated, although it hasn't been fully integrated yet. With the adoption of ERP, EPSS is getting ready for the possible advantages.

ICT use in EPSS has already demonstrated advantages in enhancing procurement process coordination and optimizing operations. It is anticipated that continued investments in ICT infrastructure, especially in the deployment of ERP, will augment these advantages and resolve any implementation obstacles. Real-time information will be made available, and the procurement process's transparency will be improved by the continuous deployment of eGP.

4.4.5 Pharmaceutical procurement performance

This study tried to assess the performance of pharmaceutical procurement in EPSS, and its findings are presented in the table below.

Table 4. 6: Descriptive statistics of pharmaceutical performance procurement

Items	N	Mean	Std. Deviation
EPSS analyzes the cost incurred during pharmaceutical procurement.	76	3.05	0.978
EPSS manages the cost to avoid unnecessary spending.	76	2.99	0.986
Pharmaceutical products are procured in accordance with predetermined specifications.	76	2.78	0.988
Suppliers deliver the correct pharmaceutical products.	76	3.29	1.030
There is delay in conducting pharmaceutical procurement	76	2.99	0.986
There is delay in effecting the payments for suppliers	76	2.99	1.013
Suppliers deliver pharmaceutical products timely.	76	2.87	1.011
Grand total	**76**	**2.99**	**0.999**

Source: SPSS own survey (2024)

As it can be shown in table 4.6, respondents have a comparatively moderate agreement for statements Suppliers deliver the correct pharmaceutical products and EPSS analyzes the cost incurred during pharmaceutical procurement with mean of 3.29 and 3.05 respectively.

In general, responses were moderately variable with respect to the state procurement performance of EPSS, as the descriptive statistics showed, with a high standard deviation spread with a range of 0.978 to 1.030.

4.5 Correlation Analysis

Correlation analysis is a statistical technique for determining the strength of the relationship between two metric variables. Correlation analysis was used to determine the strength and direction of the relationship between the independent variable(s) and the dependent variable. The Pearson correlation coefficient was utilized in this study to determine the strength and direction of the correlations between the independent and dependent variables (Newbold *et al.*, 2018). According to Muya *et al*. (2019), the correlation coefficient (R) should have values between -1 and +1. A zero (0) correlation indicates that there is no link at all between the independent and dependent variables, according to Alsaqr (2021). When the correlation coefficient rises above 0.9, a very strong relationship is evident. A strong relationship is shown by a correlation coefficient of 0.7–0.9. In the range of 0.4 to 0.7, it indicates a moderate degree of relationship. If a correlation coefficient is in the range of 0.3 to 0.4, it is deemed weak. If the range is less than 0.2, there is very weak correlation between the variables. The computed values of the Pearson's correlation coefficient are summarized in the table below.

Table 4. 7: Pearson Correlation analysis

		PP	P	R	C	I
P	Pearson Correlation	.768**	1			
	Sig. (2-tailed)	.000				
	N	76	76			
R	Pearson Correlation	.924**	.764**	1		
	Sig. (2-tailed)	.000	.000			
	N	76	76	76		
C	Pearson Correlation	.804**	.848**	.677**	1	
	Sig. (2-tailed)	.000	.000	.000		
	N	76	76	76	76	
I	Pearson Correlation	.943**	.763**	.890**	.814**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	76	76	76	76	76
PP	Pearson Correlation	1	.768**	.924**	.804**	.943**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	76	76	76	76	76
**. Correlation is significant at the 0.01 level (2-tailed).						

Source: SPSS own survey (2024)

Where: P= Procurement Planning, R = Rules and Regulations, C= Employee competency, I= ICT utilization and PP= procurement performance.

As illustrated in the above table 4.7, procurement planning has a positive and significant correlation with the procurement performance of the organization ($r = 0.768$, $P<0.01$). Hence, this shows a strong relationship between the two variables. There is also a positive and significant correlation between the procurement rules and regulations and procurement performance ($r = 0.924$, $P<0.01$), and this indicates a very strong relationship. In addition, employee competency is positively and significantly correlated with the EPSS procurement performance ($r = 0.804$, $P<0.01$), so the result shows a strong relationship between the variables. Whereas ICT utilization has a positive and significant correlation with the procurement performance of the organization ($r = 0.943$, $P<0.01$), which shows a very strong relationship between the two variables.

As a whole, the correlation analysis showed a statistically significant and positive relationship between the EPSS procurement performance (dependent variable) and independent variable (Procurement Planning, Rules and Regulations, Employee competency and ICT utilization). Hence as per Abebe (2021) and Muya *et al*. (2019), these results are in line with providing a tool attain procurement performance of EPSS.

4.6 Regression Analysis and Hypothesis Testing

Regression analysis is systematic approach for examining the associative relationships between a dependent variable and one or more independent variables (predictor variables). This study has four independent variables and hence multiple regression analysis was deployed to measure the effect of these independent variables on the procurement performance of EPSS which is a dependent variable.

4.6.1. Assumptions of Regression Analysis

A. Normal Distribution Test

In statistics and data analysis, determining whether or not a data sample was drawn from a population that is regularly distributed is a typical technique. Normality tests are used to determine the likelihood that an underlying random variable will be regularly distributed or to assess if a data collection is well-modeled by a normal distribution (Hernandez, 2021). The

Shapiro-Wilk normality test, which is regression-based, is the most effective normality test technique, according to this research report.

Table 4. 8: Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Studentized Residual	.043	76	.200*	.987	76	.653
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

Source: SPSS own survey (2024)

The Shapiro-Wilk test yields a significance level of 0.653, which is greater than the usual p-value of 0.05. The data's normal distribution is the Shapiro-Wilk test's null hypothesis. A significance level of 0.653 means that there is not enough data to reject this null hypothesis at the selected significance level, which is usually 0.05. Consequently, a significance level of 0.653 indicates that there is a reasonable likelihood that the data are distributed normally. Thus, it can be said that the regression analysis process has been completed because the residual value is normally distributed.

B. Linearity Test

If there is a relationship between the dependent and independent variables, it can be precisely estimated using multiple regressions. When linearity is present, there should be a straight-line relationship between the residuals and the predicted scores of the dependent variable. As a linear function of the predictor variables, it characterizes the dependent variable. The results of the regression analysis have either over- or under-estimated the underlying relationship between the variables if there is a nonlinear relationship between the dependent and independent variables (Ararsa, 2020). The best way to counteract linearity is with a typical p-plot residual. There is a linear relationship between the independent and dependent variables.

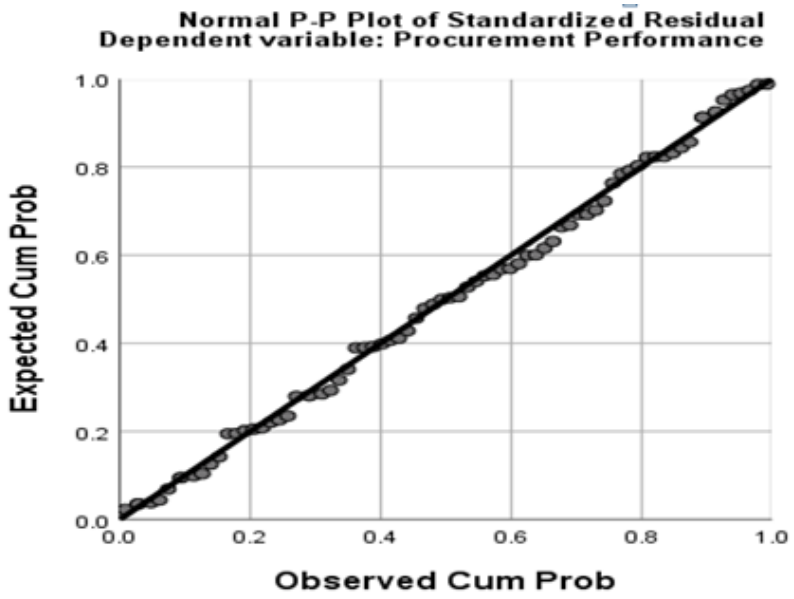

Figure 4.1: Linearity test
Source: SPSS own survey (2024)

C. Multi-Collinearity Test

Multicollinearity is a statistical concept that characterizes the relationship between several independent variables in a model. If r = 1, then the predictor variables are precisely multicollinear, which causes incorrect inferences to be made regarding the relationship between the independent and dependent variables (Kim, 2019).

Tolerance and the Variance Inflation Factor (VIF) are the most dependable measures of how multicollinear the independent variables are. Kim (2019) states that there are no problems with multicollinearity with the data if the tolerance and variance inflation factors are greater than 0.1 and less than 10, respectively.

Table 4. 9: Multicollinearity test

Model		Collinearity Statistics	
	Independent Variables	Tolerance	Tolerance
1	Procurement planning	0.196	5.095
	Procurement rules and regulations	0.149	6.706
	Employee competency	0.168	5.970
	ICT utilization	0.115	8.678

Source: SPSS own survey (2024)

As illustrated in the above table 4.9 that the minimum Tolerance value is 0.115, which is above 0.1, and the maximum VIF value is 8.678, which is below 10. As a result, the values of the predictors' variance inflation factors, and tolerance explain why there are no issues with multi-collinearity because the predictor variables are neither highly related nor overlapped with one another.

D. Homoscedasticity Test

When a regression model exhibits homoscedasticity, it means that the variance of the errors, also known as residuals, remains constant at every level of the independent variables. Stated differently, it suggests that the residuals' spread around the regression line is constant for a range of predictor variable values (Gujarati & Porter, 2019). A scatter plot of standardized residuals or errors by regression of standardized predicted value can be used to visually verify the assumption (Gebreab, 2022).

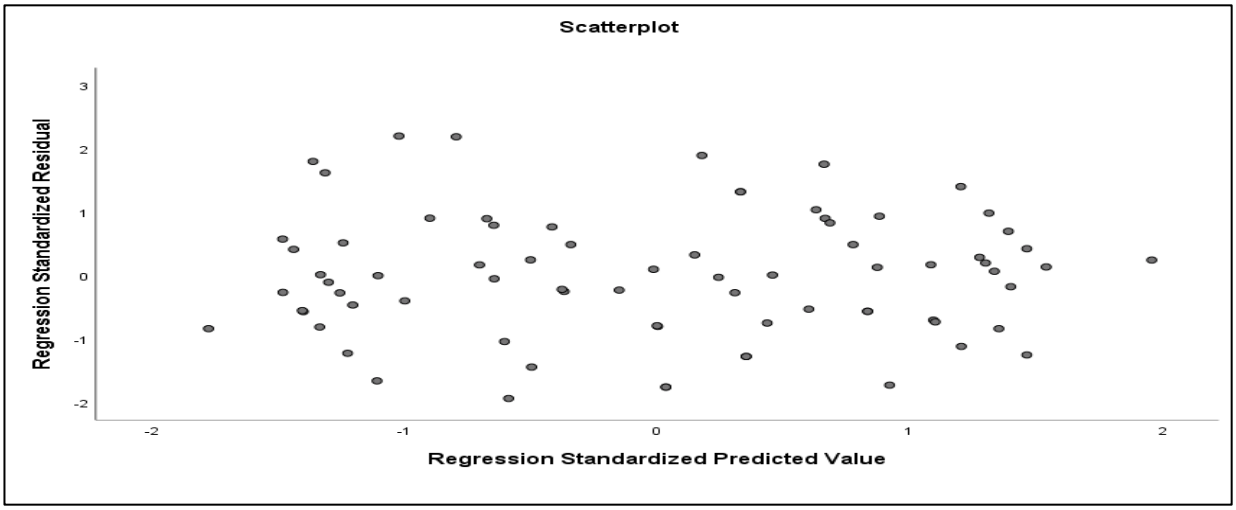

Figure 4.2: Homoscedasticity test

Source: SPSS own survey (2024)

Since the majority of the distributed plot attributes are close to zero, as can be seen in the image figure above, the error variance is constant. Thus, there is no violation of the homoscedasticity assumption in this study.

4.6.2 Regression Model

A statistical tool for examining and quantifying the relationship between one or more independent variables and one or more dependent variables is a regression model. It's frequently utilized for understanding the relationship between variables, testing hypotheses, and making predictions (Montgomery *et al.*, 2021). The model in the study is used to ascertain the relationship between the dependent variable (procurement performance) and the independent variables (procurement planning, rules and regulations, employee competency, and ICT utilization).

Table 4. 10: Coefficient of determination (R^2)

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.968[a]	.937	.933	.17054	1.823
a. Predictors: (Constant), ICT Utilization, Procurement Planning, Employee Competency, Procurement Rules and Regulations					
b. Dependent Variable: Procurement Performance					

Source: SPSS own survey (2024)

The multiple correlation coefficient value of 0.968, represented by "R" in the model summary above, indicates a very strong connection between the independent and dependent variables and, as such, warrants a good degree of prediction. The effects of independent variables on the Ethiopian Pharmaceutical Supply Service's procurement performance are ascertained through the application of the coefficient of determination (R Square value) study.

The independent variables in this study account for 93.7% of the variation in the dependent variable, procurement performance in the EPSS, according to the coefficient of determination, or R-squared. This indicates that a sizable amount of the observed variance in procurement performance may be explained by the criteria that were chosen. It is noteworthy, therefore, that additional factors not taken into account in this study account for the remaining 6.3% of the difference in EPSS procurement success. Additionally, the table shows an adjusted R Square value of 0.933, indicating that results may have varied by around 6.7% from the current findings if the study population had been different.

In summary, when predicting the procurement performance of EPSS, the four independent variables named procurement planning, procurement rules and regulations, employee competency, and ICT utilization are generally good explanatory variables.

Analysis Of Variance (ANOVA)

Table 4. 11: ANOVA results

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	30.665	4	7.666	263.600	.000[b]
	Residual	2.065	71	.029		
	Total	32.730	75			
a. Dependent Variable: Procurement performance						
b. Predictors: (Constant), ICT Utilization, Procurement Planning, Employee Competency, Procurement Rules and Regulations						

Source: SPSS own survey (2024)

It can be determined whether the whole model fits the research article well by calculating the F ratio. The level of significance is less than 0.05 (0.01), as can be seen in the table, which explains why there is a statistically significant association between the independent and dependent variables (Gebreab, 2022).

Table 4.11 above presents the overall statistical significance of the regression model (p=0.000), as determined by the ANOVA findings. The large F-value (263.6) and the significant p-value show that the predictors in the model account for a sizable portion of the variation in the dependent variable.

4.6.3 Regression Coefficients

The table 4.12 displays the regression coefficients that delineate how procurement planning, procurement rules and regulations, employee competency and ICT utilization affect the procurement performance of the Ethiopian Pharmaceutical Supply Service.

Table 4. 12: Regression coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		ß	Std. Error	Beta		
1	(Constant)	.261	.097		2.691	.009
	Procurement planning	-.147	.069	-.143	-2.132	.036
	Procurement rules and regulations	.466	.068	.531	6.879	.000
	Employee competency	.258	.067	.280	3.850	.000
	ICT utilization	.340	.085	.351	4.000	.000

a. Dependent Variable: Procurement Performance

Source: SPSS own survey (2024)

Standardized Coefficient (Beta)

Standardized coefficients, often denoted as Beta coefficients, are used primarily in regression analysis to compare the relative importance of different independent variables in predicting a dependent variable. As illustrated in the table 4.12, procurement rules and regulations (Beta = 0.531) has the highest standardized coefficient, followed by ICT utilization (Beta = 0.351), employee competency (Beta = 0.280) and procurement planning (Beta = -0.143). Procurement rules and regulations had the highest relative effect on pharmaceutical procurement performance among the four predictor variables. All independent variables have a P value less than 0.05. Hence, the predictive variables of procurement planning, procurement rules and regulations, ICT utilization and employee competency are statistically significant in predicting the procurement performance of EPSS at a 5% significance level and 95% confidence level.

Unstandardized Coefficient (ß)

Unstandardized coefficients, often denoted as ß, are used in regression analysis to quantify the relationship between independent variables and the procurement performance of the pharmaceutical.

The unstandardized coefficients (ß1, ß2, ß3, ß4) are coefficients of the examined regression model, so the general regression model for procurement performance was equated as follows:

$$Y = ß0 + ß1X1 + ß2X2 + ß3X3 + ß4X4 + e$$

Where.

Y = Dependent variable, Procurement Performance (PP)

ß0 = Constant factor = 0.261, e = Error

X1 = Procurement planning (P) ß1 = Procurement planning Coefficient =-0.147

X2 = Procurement rules and regulations (R) ß2 = Procurement rules and regulations Coefficient =0.466

X3 = Employee competency (C), ß3 = Employee competency Coefficient = 0.258

X4 = ICT Utilization (I) ß4 = ICT Utilization Coefficient = 0.340

Therefore, the equation is written as.

Y = 0.261 - 0.147X1 + 0.466 X2 + 0.258X3 + 0.340X4 + e

As shown in table 4.12 by examining the unstandardized regression coefficient (ß) for each predictor variable, the results indicate that Procurement rules and regulations (ß = 0.466, p< 0.05), Employee competency (ß = 0.258, p< 0.05) and ICT Utilization (ß = 0.340, p< 0.05) have significant positive relationships with procurement performance. Therefore, there is a positive relationship between the three predictors (Procurement rules and regulations, Employee competency and ICT Utilization) and the outcome (procurement performance), as indicated by the positive values of the unstandardized regression coefficient. The results of the regression coefficient indicate that these independent variables are statistically significant in predicting procurement performance. In other words, a unit increase or change in these three predictor variables increases the procurement performance of pharmaceutical. Accordingly, a unit increase in procurement rules and regulations, ICT utilization and employee competency will result in a 46.60%, 34%, and 25.80% improvement in the pharmaceutical procurement performance of EPSS, respectively, at a sig. value less than 0.05. As a result, these findings give strong support for the effectiveness and efficiency of the Ethiopian Pharmaceutical Supply Service's procurement performance depends on these predictor variables. However, procurement planning (ß = -0.147, p< 0.05) is found to have a negative relationship between procurement planning and pharmaceutical procurement performance. This indicates that the more repetitive is procurement planning, there is a decrease in the procurement performance of pharmaceutical.

4.6.4 Hypothesis Testing

A hypothesis is a prediction or theory put forth to explain a phenomenon or the interaction of variables. Scientific research uses hypotheses as the basis for empirical investigation. These hypotheses are developed from observations, prior research, or theoretical frameworks (Price & Jhangiani, 2017). Therefore, in light of the regression analysis's findings, the research paper's hypothesis is tested in the following ways:

A. The effect of procurement planning

Hypothesis 1. Procurement planning significantly and positively affects the pharmaceutical procurement performance of EPSS.

The unstandardized ß coefficient of the regression result for procurement planning is -0.147 with a P-value of 0.036, which is less than the level of significance of 0.05, as can be seen in the above table 4.12. This indicates that there is a statistically significant and negative impact on procurement performance.

Therefore, the study has rejected the proposed hypothesis (alternative hypothesis H1) given the significant negative relationship found in the study.

B. The effect of Procurement rules and regulations

Hypothesis 2. Procurement rules and regulations significantly and positively affect the pharmaceutical procurement performance of EPSS.

The unstandardized ß coefficient of the regression result Procurement rules and regulations is 0.466 with a P-value of 0.000, which is less than the level of significance of 0.05, as can be seen in the above table 4.12. This indicates that there is a statistically significant and positive impact on procurement performance.

Therefore, the study has accepted accepts the proposed hypothesis (alternative hypothesis H2) which states that Procurement rules and regulations significantly and positively affect the pharmaceutical procurement performance of EPSS by rejecting the null hypotheses (HO).

C. The effect of Employee competency

Hypothesis 3. Employee competency significantly and positively affects the pharmaceutical procurement performance of EPSS.

The unstandardized ß coefficient of the regression result employee competency is 0.258 with a P-value of 0.000, which is less than the level of significance of 0.05, as can be seen in the above table 4.12. This indicates that there is a statistically significant and positive impact on procurement performance.

Therefore, the study has accepted accepts the proposed hypothesis (alternative hypothesis H3) which states that employee competency significantly and positively affects the pharmaceutical procurement performance of EPSS by rejecting the null hypotheses (HO).

D. The effect of ICT utilization

Hypothesis 4. ICT utilization significantly and positively affects the pharmaceutical procurement performance of EPSS.

The unstandardized ß coefficient of the regression result ICT utilization is 0. 340 with a P-value of 0.000, which is less than the level of significance of 0.05, as can be seen in the above table 4.12. This indicates that there is a statistically significant and positive impact on procurement performance.

Therefore, the study has accepted accepts the proposed hypothesis (alternative hypothesis H4) which states that ICT utilization significantly and positively affects the pharmaceutical procurement performance of EPSS by rejecting the null hypotheses (HO).

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides an overview of the study's major findings, conclusions drawn from those findings, recommendations for improving the pharmaceutical procurement performance of Ethiopian Pharmaceutical Supply Service, and details on suggested areas future research study based on the analyzed data in light of the objectives of the study.

5.2 Summary of the findings

The objective of this study was to assess determinants of procurement performance (specifically procurement planning, procurement rules and regulations, employee competency and ICT utilization) in the Ethiopian Pharmaceutical Supply Service. The major findings of this study are summarized as follows.

Seventy-six (76) of the eighty distributed questionnaires were returned, representing a 95% response rate. The Cronbach's Alpha values were above 0.70 for all of the independent variables which ensured the internal consistency of the research questionnaires in a good and reliable range according to Hair *et al*. (2016).

The overall mean was computed using the descriptive statistics for the determinants of procurement performance revealed that there is a moderate level of agreement among respondents with the employee competency (M = 3.02, SD = 0. 995) and ICT utilization (M = 2.99, SD = 0. 999) of EPSS. With respect to procurement of planning (M = 2.97, SD = 1.013) and procurement rules and regulation (M = 2.96, SD = 0.988) the overall mean is found to be with a moderate level of agreement according to Alkharusi (2022), indicating room for improvement in these areas.

Pearson’s correlation analysis showed that a positive and significant correlation between determinants of procurement performance and pharmaceutical procurement performance of EPSS. Accordingly, procurement planning with ($r = 0.768$, $P<0.01$), procurement rules and regulations with ($r = 0.924$, $P<0.01$), employee competency with ($r = 0.804$, $P<0.01$) and ICT

utilization with ($r = 0.943$, $P<0.01$). Hence, in accordance with Alsaqr (2021), the study revealed that procurement rules and regulations and ICT utilization have very strong and positive significant relationships with pharmaceutical procurement performance. Whereas procurement planning and employee competency have strong and positive significant relationships with pharmaceutical procurement performance.

According to the model summary's multiple regression results, the R-squared value of 93.7% suggests that the model, predictors which include procurement planning, procurement rules and regulations, ICT utilization, and employee competency, can explain a large portion of the variance in procurement performance. However, further research is needed to explore the remaining factors that account for the remaining 6.3% of the variance.

The study also discovered that a unit increase in procurement rules and regulations, ICT utilization and employee competency will result in a 46.60%, 34%, and 25.80% improvement in the pharmaceutical procurement performance of EPSS, respectively, at a significance value less than 0.05. Hence, it is implied that from these unstandardized regression coefficients that procurement performance is statistically affected by these independent factors.

The findings of the multiple regression analysis also showed that there is a negative relationship between procurement planning and pharmaceutical procurement performance. This indicates that the more repetitive is procurement planning, there is a decrease in the procurement performance of pharmaceutical. However, this result contradicts other studies (Aberu, 2017; Gebreab, 2022) that contend that procurement performance is positively impacted by procurement planning.

5.3 Conclusions of the study

Based on the findings of the study, the following conclusions are drawn on the pharmaceutical performance of EPSS.

This study has offered empirical support for a framework that defines four determinants that affect pharmaceutical procurement performance and explains how these factors relate to procurement performance in the context of EPSS. Accordingly, rules and regulations and ICT utilization have very strong and positive significant relationships with pharmaceutical procurement performance. Whereas employee competency has strong and positive significant relationships with pharmaceutical procurement performance.

The multiple regression analysis results demonstrated a positive correlation and significant impact of procurement rules and regulations, ICT utilization, and employee competency on the pharmaceutical procurement performance of EPSS. The model only explained 93.7% of the variation in public pharmaceutical procurement performance, indicating that it did not take into account other factors that explain 6.3% of the variation.

The study also reveals a negative correlation and a significant impact between procurement planning and the pharmaceutical procurement performance of EPSS.

The existing rules and regulations of public procurement do not adequately consider the unique characteristics of pharmaceutical, leading to inefficiencies and delays in the procurement process of EPSS.

5.4 Recommendations of the study

Based on the findings of the study, the following recommendations are drawn on the pharmaceutical performance of EPSS.

- The repetitive procurement planning due fragmented request has a negative impact on procurement performance of EPSS. Hence, EPSS should work to enhance robustness its procurement planning by closely working with key stakeholders like Ministry of Health, Regional Health Bureaus and Health facilities.
- EPSS should advocate for revisions to the public procurement rules and regulations that take into account the special needs of the pharmaceutical industry since certain articles hinders the procurement process for pharmaceutical.
- EPSS should invest in technology infrastructure and systems that streamline procurement processes, such as e-procurement platforms like electronic government procurement and enterprise resource planning, inventory management software, and data analytics tools, since ICT utilization showed a significant positive impact on procurement performance.
- EPSS should enhance the competency and skills of procurement personnel by means of focused training and professional development initiatives. This could involve training on best practices for procurement, contract management, negotiation techniques, and ICT proficiency. Furthermore, EPSS may consider implementing performance evaluation systems that reward procurement staff members for their ongoing learning and development.
- EPSS should set up comprehensive monitoring and evaluation systems to consistently appraise the efficiency of procurement process and pinpoint opportunities for enhancement. This could entail benchmarking against industry best practices, requesting input from stakeholders, and carrying out recurring audits. Over time, EPSS can optimize procurement processes by identifying bottlenecks and addressing emerging challenges through continuous monitoring of performance metrics.

5.5 Suggestions for further study

The findings of this study have identified the role independent variables namely procurement planning, procurement rules and regulations, employee competency and ICT utilization that significantly affect the pharmaceutical procurement performance of EPSS. Given the limited explanatory power of the current model and the remaining factors that account for variance in procurement performance, further research is necessary.

Hence, additional studies to explore other potential determinants of procurement performance, such as supplier relationships, quality control measures, and external market dynamics. This will provide a more comprehensive understanding of the factors influencing procurement effectiveness and inform targeted interventions for improvement.

Furthermore, longitudinal studies could be carried out to monitor performance patterns over time and pinpoint possible change agents in order to gain a deeper understanding of the long-term dynamics of procurement performance. This can entail looking at procurement performance data gathered over an extended period and assessing how adjustments to organizational procedures, guidelines, or outside influences affect the way things work out.

REFERENCES

Aberu, A. (2017). Factors Affecting Public Procurement Performance in Ethiopia: The Case of Public Procurement and Property Disposal Services. MA Thesis, School of Commerce.

Abera, G., & Bezabih, M. (2020). Assessing the influence of procurement regulations on public procurement performance: A case study of selected public organizations in Ethiopia. *Journal of Public Administration and Governance,* 10(2), pp. 87-104.

Abebe, A. (2021). Factors Affecting Public Procurement Performance in Ethiopia:

Case of Jimma, Mettu and Bonga Universities. MA Thesis, Jimma University.

Ararsa, A. (2020). Determinants of Pharmaceuticals Material Procurement Performance in Jimma University Medical Center. *Global Scientific Journal*, 8(11), pp.1163-1172.

Alefan, Q., Amairi, R. & Tawalbeh, S. (2018). Availability, prices and affordability of selected essential medicines in Jordan: a national survey. *BMC Health Service Research*, 18(787).

Alkharusi, H. (2022). A descriptive Analysis and Interpretation of Data from Likert Scales in Educational and Psychological Research. *Indian Journal of Psychology and Education*,12 (2), pp. 13-16.

Alsaqr, A. M. (2021). Remarks on the use of Pearson's and Spearman's correlation coefficients in assessing relationships in ophthalmic data. *Journal of African Vision and Eye Health*, 80(1).

Antony, K., & Josphat, K. (2016). Assessment of determinants of procurement performance at Kenya pipeline company. *Kenya. International Journal of Research in Business Management*, 4(4), pp. 43-54

Asif, K. (2022). The Impact of Procurement Strategies on Supply Chain Sustainability in the Pharmaceutical Industry. *South Asian Journal of Social Review*, 1(1), pp. 53-64.

Ayenachew, C. (2016). Challenges of Public Procurement Performance in the case of Federal Public Procurement and Property Disposal Service. Civil Service University, Addis Ababa, Ethiopia

Baraki, M.M. (2020). Determinants of Procurement Performance inNon Governmental organization: The Case of Management Sciences for Health, Ethiopia. MA Thesis, School of Commerce.

Berhie, S. (2017). Assessment Of Factors Influencing Good Pharmaceuticals Procurement Practice Employees Perception. The Case of Pharmaceuticals Fund and Supply Agency of Ethiopia. MA Thesis, School of Commerce.

Boulton, R., & Collins, S. (2019). The limitations of rigid procurement planning in dynamic markets. *International Journal of Procurement Management*, 12(3), pp. 245-262.

Brown, T., & Miller, E. (2017). Challenges in ICT adoption in public procurement: A case study analysis. *Government Information Quarterly*, 34(1), pp. 45-62.

Carter (2018). Procurement and supply environments, Uk: The Chartered Institute of Procurement & Supply (CIPS)

Changalima, I. A., Mwaiseje, S. & Mushi, G. (2021). Procurement planning as a strategic tool for public procurement effectiveness: Experience from selected public procuring entities in Dodoma city, Tanzania. *Journal of Public Procurement*, 21(1), pp. 37-52

Chepkesis, K. & Keitany, P. (2018). Effect of procurement planning on suppliers performance in public institutions: a case of Moi University. *European Journal of Logistics, Purchasing and Supply Chain Management*, 6 (2), pp.1-9

Damte, B. (2018). Procurement practices and challenges in Ethiopia. MA Thesis. St. Mary's University.

Demissie, A., Fenta, H., & Yirga, W. (2018). Employee competency and public procurement performance in developing countries: A case study of Ethiopia. *International Journal of Public Administration and Management Research*, 6(2), pp. 34-49.

EPSA (2020). Pharmaceuticals Supply Transformation Plan II (PSTP II) 2020/21 - 2029/30

EPSA (2020). PROCUREMENT STRATEGY 2020–2025.

EPSA (2021). Comprehensive Market Shortcomings Assessment Findings Report.

EPSS (2023). Annual Performance Report.

Evans, J.L. (2016). Determinants of procurement performance in commercial banks within East Africa. University of Nairobi Research Archive. Available from: http://erepository.uonbi.ac.ke/handle/11295/98783[Accessed on November 24, 2023]

FDRE. (2007). The Federal Democratic Republic of Ethiopia Drug Fund and Pharmaceuticals Supply Agency Establishment. Proclamation. No, 553/2007. Addis Ababa, Federal Negarit Gazeta. 13th Year No. 64. Addis Ababa, pp. 3939–3947.

FDRE. (2009). The Federal Democratic Republic of Ethiopia, 2009a. The Ethiopian Federal Government Procurement and Property Administration Proclamation No. 649/2009. Federal Negarit Gazeta.15th Year No 60. Addis Ababa, pp. 4859–4910.

Gebreab, A.B. (2022). The Effect of Tender Management on Procurement Performance

of Medical Devices: The Case of Ethiopian Pharmaceuticals Supply Service. MA Thesis.

George, GN. & Lucy, G. (2016). Factors Influencing Procurement Performance in State Corporations in Kenya- A Case Study of Kenya Ports Authority. *International Journal of innovative research and development*, 5(6), pp. 196-215

Gikonyo, P. K. (2014). Factors Affecting Implementation of Public Procurement Act in SACCO Societies in Kenya. *International Journal of Academic Research in Business and Social Sciences*, 4 (2), pp.169-194.

Gizaw, A.T. (2017). An analysis of international procurement practices and challenges: The case of Addis Ababa University. Thesis paper, AAU, Addis Ababa, Ethiopia (unpublished). Available from: https://www.studocu.com/row/document/addis-ababa-university/architecture/asfaw-tsegaye-1212/45844865 [Accessed on November 24,2023].

Gujarati, D. N., & Porter, D. C. (2019). "Basic Econometrics." McGraw-Hill Education.

Guyer, A. L. (2021). Procurement of Medicines in Sri Lanka: A Case Study. Harvard T.H. Chan School of Public Health. Available from: https://www.exemplars.health/-/media/files/egh/resources/ecr/sri-lanka/34-working-paper-4-procurement-of-medicines-in-sri-lanka-a-case-study[Accessed on February 22, 2024].

Hair, J.F., Celsi, M., Money, A., Samouel, P. & Page, M. (2016). The Essentials of Business Research Method, 3rd Edition. Available from: https://digitalcommons.kennesaw.edu/facbooks2016/2/ [Accessed on March 30, 2024].

Hamza, S.B., Gerbi, A. & Ali, S.H. (2016). Factors Affecting Procurement Performance in the Case of Awassa Textile Share Company. *Global Journal of Management and Business Research: G Interdisciplinary*, 16(3), pp. 21-34

Holtom, B., Baruch, Y., Aguinis, H., & Ballinger, G. A. (2022). Survey response rates: Trends and a validity assessment framework. *Journal of human relations,* 75(8), pp. 1560 –1584

Indu, P.V. & Vidhukumar, K. (2019). Research designs_ An overview (Column: Research Methods in Psychiatry). *Kerala Journal of Psychiatry*, 32(1), pp. 64-67.

Jarvis, (2018). Ethical procurement and supply.UK: The Chartered Institute of Procurement & Supply (CIPS)

Joseph, M. (2016). Implications of poor procurement planning in the public sector. A case study of the Office of the Prime Minister, Uganda. MA Thesis. Makerere University, Uganda.

Kabubu, C. W. (2016). Internal factors affecting the procurement process of medical supplies in the public hospitals in Nyeri County. MA Thesis.

Kakwezi, A. & Nyeko, S. (2019). Procurement Processes and Performance: Efficiency and Effectiveness of the procurement function. *International Journal of Social Sciences Management and Entrepreneurship,* 3(1), pp. 172 – 182.

Kebede, B., Tilahun, T., & Tassew, W. (2016). Impact of employee competency on public procurement performance in Ethiopia: Evidence from selected federal government institutions. *African Journal of Business Management*, 10(18), pp. 418-427.

Kibret, F.A. (2018). Factors Affecting Pharmaceutical Procurement Practices and Availability of Life Saving Pharmaceuticals in the Case of Public Hospitals of Ethiopia. MA Thesis. School of Commerce.

Kim, J.H. (2019). Multicollinearity and misleading statistical results. *Korean Journal of Anesthesiology*, 72(2), pp. 558-569

Kohler, J.C. & Dimancesco, D. (2020). The risk of corruption in public pharmaceutical procurement: how anti-corruption, transparency and accountability measures may reduce this risk. *Global Health Action*, 13(1), pp.1-10

Kuyawo, K. K. (2019). Factors Influencing the Effectiveness of Procurement Process of Pharmaceutical Products: A Case of Karat District Hospital Konso Zone SNNPR, Ethiopia[online]. MA Thesis. Accessed from: http://etd.hu.edu.et/browse?type=author&value=KUSHABO%2C+KUNTE+KUYAWO [Accessed on November 23, 2023].

Legesse, R. (2017). Public procurement practices and challenges in Ethiopia. MA Thesis. Addis Ababa University, College of Business and Economics.

Lemma, T., Bekele, M., & Kebede, K. (2019). Procurement planning and performance of public procurement in Ethiopia. *Journal of Public Administration and Governance*, 9(4), pp. 82-97.

Mabhodha, S. & Choga, F. (2021). The Impact of Information Communication Technology (ICT) on Procurement Processes: Case of Zimbabwean Urban Councils (2009 to 2018). *Open Journal for Information Technology*, 4(1), pp. 25-34.

Masemola, S.C. (2022). Drivers of Procurement Performance in the Public Health Industry in the Gauteng Province. MA Thesis, Vaal University of Technology.

Mason, (2018). Contract administration, Uk: The Chartered Institute of Procurement & Supply (CIPS).

Mazibuko, G. & Fourie, D, J. (2017). Manifestation Of Unethical Procurement Practices in The South African Public Sector. *African Journal of Public Affairs*, 9(9), pp.107-117.

Mekonen, T., Seid, M., & Debebe, Z. (2018). Impact of procurement planning on public procurement performance: The case of Ethiopian public procurement system. *International Journal of Supply Chain Management*, 7(4), pp. 131-139.

Ministry of Finance (2018). e-GP strategy and roadmap, Ethiopia.

Mirkena, D., Megersa, R., & Ayalew, M. (2021). Challenges in Procurement of Pharmaceuticals in the Ethiopian Health Institutions. *Industrial Engineering Letters*, 11(2), pp. 1-18.

MOFED (2010). Federal Public Procurement Directive.

Moges, S. (2020). Assessment of pharmaceuticals procurement practices and challenges: in the case of Ethiopian Pharmaceutical Supply Agency. MA Thesis. School of Commerce.

Montgomery, D. C., Peck, E. A., & Vining, G. G. (2021). "Introduction to Linear Regression Analysis." John Wiley & Sons.

Mrope, N.P., Namusonge, G. S. & Iravo, M.A. (2017). Does Compliance with Rules Ensure Better Performance? An Assessment of The Effect of Compliance with Procurement Legal And Regulatory Framework on Performance Of Public Procurement In Tanzania. *European Journal of Logistics, Purchasing and Supply Chain Management*, 5(1), pp.40-50.

Muriungi, I. (2014). Public participation and civilian oversight: The key to improving integrity in public procurement. Transparency International: Advocacy & legal advisory center.

Muya, M.W., Wanjiru, S. & Datche, E. (2019). Effects of Tender Management practices on Procurement Performance at Kenya Ferry Services. *IJARKE Business & Management Journal*,1(4), PP. 233-240.

Mwangi, M. (2014). The Impact of Public Procurement Policy on Teaching and Learning in Selected Public Secondary Schools in Kahuro District, Murang`a County, Kenya. *Interdisciplinary Journal of Contemporary Research in Business*, 2(3), pp. 25 -36.

Naomi, J. & Karanja, K. (2016). Role of regulatory framework on implementation of e-procurement by state corporations in the ministry of agriculture in Kenya. *International Academic Journal of Procurement and Supply Chain Management,* 2 (2), pp. 41-50

Ndemo, B.M. & Achuora, J. (2020). Influence of Procurement Key Performance Indicators on The Performance of State Agencies in Kenya. *International Journal of Supply Chain and Logistics*, 4(2), pp. 80 -103.

Negash, D., Tesfaye, H. & Belayneh, E. (2019). Exploring the challenges and effects of the Public Procurement and Property Administration Proclamation and Directive on Procurement Performance of Pharmaceutical Supply Agency, Ethiopia.

Negera, G., Merga, H. & Gudeta, T. (2021). Health professionals' perception of pharmaceuticals procurement performance in public health facilities in Southwestern Ethiopia. *Journal of Pharmaceutical Policy and Practice*, 14(58).

Newbold, P., Carlson, W.L. & Thorne, B. (2018). Statistics for Business and Economics. Pearson

Ngari, J. N., & Machoka, P. (2020). Determinants of public procurement in tertiary institutions in Kenya: A case study of The Kenya Medical Training College. *The Strategic Journal of Business & Change Management*, 7(4), pp. 645 – 663.

Nijboer, k., Senden, S. & Telgen, J. (2017). Cross-country Learning in Public Procurement: An exploratory study. *Journal of public procurement*, 17(4), pp. 449-482

Njagi, M., M., & Shalle, N., (2016). Role of Supplier Relationship Management on Procurement Performance in Manufacturing Sector in Kenya: A case of East African Breweries. *International Academic Journal of Procurement and Supply Chain Management*, 2(1), pp. 1- 20

Oenga, N.O., Thogori, M. & Wabwire, J.M (2022). Influence of Procurement Plan on the Effectiveness of Procurement Process among Public Universities in Eastern Region, Kenya. *International Journal of Economics, Business and Management Research*, 6(2), pp. 106-121.

Oliveira, T., & Martins, M, F. (2011). Literature Review of Information Technology Adoption Models at Firm Level. *The Electronic Journal Information Systems Evaluation*, 14(1), pp. 110-121

Omanji, J. A. & Moronge, M. (2018). The influence of procurement practices on performance of the public sector in Kenya. A Case of Narok County. *The Strategic Journal of Business & Change Management*, 5(2), pp. 2242 - 2268.

Onyango, C. J., (2014). Effects of Procurement Planning on Institutional Performance: A Case Study of Mombasa Law Court. *International Journal of Science and Research*, 3(11), pp. 446-455.

Patrucco, A., Luzzini, D. and Ronchi, S. (2017). Research Perspectives on Public Procurement. *Journal of public procurement,* 17(2), pp. 229-269.

Pereruan, A. (2016). Procurement practices and organizational performance. MA Thesis. University of Nairobi.

PFSA (2017). Pharmaceuticals Supply Process Reengineering (PSPR).

Price, P.C & Jhangiani, R.C. (2017). Research Methods in Psychology.

Roberts, M., Brown, K., & Lee, C. (2020). Beyond technical skills: The importance of creativity and strategic thinking in procurement. *Journal of Supply Chain Management*, 25(4), pp. 321-338.

Sacred Heart University Library (2020). Organizing Academic Research Papers: Theoretical Framework [online]. Available from: https://library.sacredheart.edu/c.php?g=29803&p=185919 [Accessed on November 21, 2023].

Scarsi, R. & Cepolina, S. (2016). Technology innovation enabling supply chain management sustainability. A framework for the apparel industry. *Int. J. Technology Transfer and Commercialization*,14(2), pp.196-213

Shunka A, (2016). Implementation Challenges of Public Procurement Plan: The Case of Federal Budgetary Institutions. Civil Service University, Addis Ababa, Ethiopia

Smith, J., & Jones, A. (2018). Challenges of stringent procurement regulations: Case studies from public procurement. *Journal of Public Procurement*, 18(2), pp. 134-152.

Taddese, E., Mekonnen, D., & Mohammed, A. (2017). Impact of procurement rules and regulations on public procurement performance in Ethiopia: Evidence from Bahir Dar City Administration. *International Journal of Innovation and Economic Development*, 3(5), pp. 18-27.

Tesfay, H. T. (2020). Assessment Of Procurement Performance of a Factory: The Case of Addis Pharmaceutical Factory S.C. MBA Thesis, St. Mary's University.

Tesfaye, T., & Zeleke, A. (2017). The role of information and communication technology in enhancing public procurement performance: Evidence from Ethiopia. *Journal of Public Administration and Governance*, 7(4), pp. 123-137.

Transparency international (2015). Public procurement planning and corruption. Anti-Corruption Helpdesk. (unpublished).

United Nations Industrial Development Organization (2017). The role of public procurement policy in driving industrial development. Vienna, Austria.

Wanyonyi, S. C. (2015). Factors Affecting Performance of Procurement Function among Public Technical Training Institutions in Kisumu Country, Kenya. *International Journal of Economics, Commerce and Management United Kingdom*, 3(5), pp. 325-337.

Woldeyes, A., Endris, G., & Tadele, D. (2019). The impact of information and communication technology on public procurement performance: A case study of Ethiopia. *International Journal of Innovation and Economic Development*, 5(3), pp. 11-21.

World Health Organization (2020). Systematic reviews for the update of the WHO Guideline on country pharmaceutical pricing policies.

World Health Organization (2015). WHO procurement strategy.

Xingxing, Z. & Kaynak, H. (2012). An agency theory perspective on supply chain quality management. *International Journal of Operations & Production Management*, 32(4), pp. 423 – 446.

Zai, I. (2021). Factors affecting procurement performance in the industries at Batam. *Journal of Business Studies and Management Review*, 4(2), pp. 145-149.

Annex I: Research Instrument

ADDIS ABABA UNIVERSITY COLLEGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Dear respondents,

I`m Cherinet Demissie, a graduate student at Addis Ababa University College of Business and Economics, School of Commerce Department of Logistics and Supply Chain Management. I am conducting research on ***THE DETERMINANTS OF PUBLIC PHARMACEUTICAL PROCUREMENT PERFORMANCE: THE CASE OF ETHIOPIAN PHARMACEUTICAL SUPPLY SERVICE (EPSS) HEAD OFFICE*** for the partial fulfillment of master's degree in Logistics and Supply Chain Management.

I would like to express my sincere gratitude to you personally for your willingness to take part in this important study. This study aims to assess the determinants of public pharmaceutical procurement performance. I guarantee that your answer will be kept highly confidential, and all information collected will only be utilized for academic purpose. It will take you fifteen to twenty minutes to complete this survey. As a result, your sincere, truthful, and timely response is a crucial component of the study's successful completion. I appreciate your cooperation in advance in answering the questions.

If you have any question, please don't hesitate to contact me via E-mail: cherinetd2010@gmail.com or Cellphone: +251911568074

Part I: General Information and Demographic background of respondents (Tick your appropriate choice).

1. Gender: Male ☐ Female ☐

2. Age: 21-30 years ☐ 31-40 years ☐ 41-50 years ☐ Above 50 years ☐

3. Level of Education: Diploma ☐ Degree ☐ Master ☐ PhD ☐

4. Profession: Pharmacy ☐ Laboratory technology ☐ Biomedical Engineering ☐

Accounting and finance ☐ Management ☐

5. How long you have worked in EPSS?

Below 3 years ☐ 3-6 years ☐ 7-10 years ☐ Above 10 years ☐

6. In which directorate you are currently working? Tender management ☐

Contract management ☐ Quantification and market shaping

7. What is your job position? Director ☐ Team leader ☐ Officer ☐

Technical Advisor ☐ If other, please specify----------

Part II: Procurement planning:

Please rate to what extent do you agree or disagree to the following statements about procurement planning of the EPSS on a Likert scale by making a tick (√). Where: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

S.N	Procurement planning of EPSS	1	2	3	4	5
1	There is repetitive planning required due to fragmented procurement requests.					
2	An effective plan helps EPSS to save money.					
3	EPSS performs its tasks according to the scheduled plan.					
4	EPSS conducts market assessment prior to the procurement plan in order to determine the current product prices.					
5	EPSS allocates enough time for planning procurements before starting the procurement process.					
6	EPSS`s plan is implemented in accordance with the budget that has been approved.					

Part III: Procurement rules and regulations:

Please rate to what extent do you agree or disagree to the following statements about the effects of procurement rules and regulation on pharmaceutical procurement of EPSS on a Likert scale by making a tick (√). Where: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

S.N	Procurement rules and regulation	1	2	3	4	5
1	The rules and regulations governing public procurement has improved competitiveness of the procurement process.					
2	The rules and regulations governing public procurement has improved the speed with which EPSS procures pharmaceutical.					
3	Public procurement rules and regulations have transparent procedures for the procurement pharmaceutical at EPSS.					

4	There are articles of public procurement rules and regulations hinders the pharmaceutical procurement process at EPSS					
5	The rules and regulations governing public procurement improves the quality of the pharmaceutical products delivered to EPSS.					

In case you wish to add, kindly specify…….

…….....

Part IV: Employee Competency:

Please rate to what extent do you agree or disagree to the following statements about Employee competency of EPSS on a Likert scale by making a tick (√). Where: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

S.N	Employee Competency	1	2	3	4	5
1	The pharmaceutical procurement of EPSS is conducted by trained and experienced employees.					
2	Employees handling the procurement process have recognized procurement qualifications.					
3	Employees carrying-out the procurement process are capable of applying public procurement principles, preparing contract and tender documents timely.					
4	The EPSS procurement team is organized with the appropriate number of employees to handle the procurement of pharmaceutical.					
5	The EPSS procurement team has the necessary skills and competence to handle complex and strategic procurements.					

In case you wish to add, kindly specify…….

…….....

Part V: Information Communication Technology (ICT) utilization:

Please rate to what extent do you agree or disagree to the following statements about ICT utilization of EPSS on a Likert scale by making a tick (√). Where: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

S.N	ICT Utilization	1	2	3	4	5
1	Information communication technology has supported in reduction of paperwork in EPSS.					
2	There is an automation system for pharmaceutical procurement in EPSS.					
3	ICT speeds up the procurement process of EPSS.					
4	The use of ICT in the EPSS has enabled the provision of real-time information for rapid decision-making.					
5	ICT is important to improve the quality pharmaceutical delivery in EPSS.					

In case you wish to add, kindly specify…….

…….....

Part VI: Procurement Performance of Pharmaceutical:

Please rate to what extent do you agree or disagree to the following statements about pharmaceutical procurement performance of EPSS on a Likert scale by making a tick (√). Where: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

S.N	Procurement performance	1	2	3	4	5
1	EPSS analyses the cost incurred during pharmaceutical procurement.					
2	EPSS manages the cost to avoid unnecessary spending.					
3	Pharmaceutical products are procured in accordance with predetermined specifications.					
4	Suppliers deliver the correct pharmaceutical products.					
5	There is delay in conducting pharmaceutical procurement					
6	There is delay in effecting the payments for suppliers					
7	Suppliers deliver pharmaceutical products timely.					