ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

Department of Logistics and Supply Chain Management

The Effect of Warehousing Practices on The Pharmaceutical Warehouse Performance: The Case of Ethiopian Pharmaceuticals Supply Service Addis Ababa.

A Thesis for Partial Fulfillment of the Requirements for Degree of Master of Art in Logistics and Supply Chain Management

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Declaration

I declare that this thesis is entitled "The Effect of Warehousing Practices on Warehouse Performance of Pharmaceuticals: A Case in Ethiopian Pharmaceutical Supply Service." It is my original work. I haveundertaken the research work with the guidance and support of my advisor. This study has never been submitted for any degree or diploma program at any other institution, and all sources of materials used for the thesis have been duly acknowledged.

Biruk Tadesse

Signature _____ Date _____

Certification

This is to certify that Biruk Tadesse carried out the research thesis titled "The Effect of Warehousing Practices on Warehouse Performance of Pharmaceuticals: The Case of Ethiopian Pharmaceuticals Supply Service (EPSS)" and submitted it as a partial fulfillment of the requirements for the award of the degree of Master of Arts in Logistics and Supply Chain Management at Addis Ababa University. It also demonstrates that the thesis complies with all university regulations and standards.

Advisor: Zelalem Bayisa (PHD)

_____ _____

Signature Date

Addis Ababa University School of Commerce

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This is to certify that Biruk Tadesse completed the research thesis titled "The Effect of Warehousing Practices on Warehouse Performance of Pharmaceuticals: The Case of Ethiopian Pharmaceuticals Supply Service (EPSS)" and submitted it as a partial fulfillment of the requirements for the award of the degree of Master of Arts in Logistics and Supply Chain Management at Addis Ababa University. It also demonstrates that the thesis complies with all university regulations and standards.

Advisor	Signature	Date
_____	_____	_____
Internal Examiner	Signature	Date
_____	_____	_____
External Examiner	Signature	Date
_____	_____	_____

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Acronym

- ASN---------- Advance Shipment Notification
- ANOVA---------- Analysis of variance
- DDG--------- ---------- Deputy Director General
- DFM-------- ---------- Distribution & Fleet Management
- EPSA------ ----------Ethiopian Pharmaceutical Supply Agency
- EPSS---------- Ethiopian Pharmaceutical Supply Service
- HSDP------ ----------Health Sector Development Program
- KPIs---------- Key Performance Indicators
- SKU---------- Stock Keeping Unit
- SOPs-------- ---------- Standard Operating Procedures
- WIM------- ---------- Warehouse & Inventory Management
- WHO------ ----------World Health Organization
- WMS------ ----------Warehouse Management System

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Abstract

The general objective of the study is to examine the effect of Pharmaceutical Warehousing Practice onwarehouse Performance at Ethiopian Pharmaceutical Supply Service. Both a quantitative research approach and an explanatory research design were used in this study. A census sampling technique wasused to gather information about warehouse performance from the entire staff who were directly involved in managing warehousing practices (officers, warehouse managers, team leaders, technical advisers, and directors). Both descriptive and inferential data analyses were produced in this study. A 94% response rate was achieved out of 100 questionnaires, with 94 valid responses. A correlation coefficient known as Pearson's product moment was calculated. The variables were found to be statistically significant, and as a result, there is a positive and strong association between storage and Warehouse performance. All factors were determined to be statistically significant,except for dispatch, and it was found that there is a positive and very strong association between orderpicking, receiving, and put away and the performance of the Warehouse. Following the completion of multiple linear regression analysis, the adjusted R^2 coefficient of determination revealed that 80.4% of the variance in pharmaceutical warehouse performance could be accounted for by the predictor variables (receiving, put-away, storage, order picking, and dispatch), indicating that the overall model fit was significant. Additionally, with a statistical significance level of 0.01& 0.05. Order picking, put-away, receiving, and dispatch were the most important variables determining the pharmaceutical warehouse performance. The study recommended the organization enhance warehouse practices (receiving, put away, storage, order picking, and dispatch) to ensure inventory accuracy and warehouse performance of pharmaceuticals.

Keywords: *Pharmaceutical, Warehousing Practices (receiving, put-away, storage, order picking, anddispatch), Warehouse performance.*

Chapter One

Introduction

1.1 Background of the study

In the corporate world of today, a warehouse is crucial to satisfying consumer needs. It is a significant source of competitiveness that determines who can make items more quickly and at lower costs. Managers need to understand warehousing thoroughly in this regard and what impact it has on the whole supply chain (Richards, 2017).

Warehousing plays an integral part in a supply chain since it acts as an intermediary that enables a vendor and a client to exchange goods. In the highly contested commerce of today, organizations encounter constant pressure to enhance their warehouse operations. To improve their customer service levels, several businesses have also modified their value propositions, which have changed the function of warehouses (Ramaa et al., 2012).

The main responsibilities of warehouse often include accepting products through a supplier, holding them in storage until wanted, picking them up when necessary, and transporting them to the right customer (Faber, 2015a). There are various methods by which the movement of items through the warehouse can be separated. When a product enters the warehouse, the receiving process is the first one it encounters. Products may be checked or transformed at this stage before being put into storage sites. Products may also come by truck or internal conveyance. The storage area can be split into two categories: the reserve location, in which items are kept in bulk or in the most cost-effective manner, and the moving location, in which goods are kept for order pickers to quickly reach. It is possible to select orders manually or somewhat automatically. Order picking entails taking products out of storage locations. These elements might be moved to the grouping or sorting stage successively (Rouwenhorst et al., 2000).

The pharmaceutical supply chain differs in certain aspects from traditional supply chains for physical commodities because of its relevance, quickness, transport, storage, and governance. A wide range of medical services and related sectors that help in the smooth operation of these different stages.

The pharmaceutical and medical sectors are exceedingly complicated due to the large number of businesses, products, processes, and intermediaries involved. Furthermore, it is widely implemented and tightly controlled on a worldwide basis (Moniruzzaman, 2016).

Pharmaceutical warehousing procedures include steps or actions like dividing the store into zones with A variety of atmospheric circumstances and levels of safety; there must be a suitable place for each good to be kept; Inventory must be organized in every area, and magnificent housekeeping should be upheld, including cleaning, inspecting, getting rid of defective and expired merchandise, tracking stock movements, and managing security; It is important to define the management structure. Staff members ought to receive the proper education, training, punishment, and rewards. There should be available handbooks and procedures with clear writing; the facilities and working conditions for personnel should be good. Its inventory must be periodically checked, and routine audits must be carried out (Dias et al., 2012).

By enabling the correct products to be accessible at the appropriate time and location, warehousing raises the utility value of goods. Operations that take place inside the warehouse structure, like a combination of orders, purchase assembly, goods integration, and cross-docking, also offer value to the overall logistics system. The main responsibility of a system for warehouse management (WMS) is to control the flow and storage of items within a warehouse, plus the handling of related duties including shipping, receiving, put away, and picking (Ramaa et al., 2012).

The primary component of supply chain management (SCM) that further implies working together and cooperating with vendors, brokers, external firms of service, and clients is warehouse management. Supply Chain Management is the organizing and overseeing of all buying, procuring, and other operations, as well as all logistics management activities (Deliver, 2011).

1.2 Statement of the Problem

Throughout the supply chain, the warehouse is crucial. Accurate product picking and dispatching from the warehouse is necessary to provide the appropriate product in the appropriate quantity. For the product to be carried on time to the appropriate customer at the correct location, it needs to be carefully marked and put on the appropriate car promptly. On behalf of producers, distributors, and merchants, these warehouses store goods that are ready for sale. They enable businesses to build up stock in advance of the introduction of new products, anticipated demand spikes, and the management of seasonality (Richards, 2017).

A health products storage facility is substantially more than just a building with storage. There must be built to effectively distribute life-saving supplies, receive, store, and arrange products. For goods moving to regional, district, local, or service delivery locations, this necessitates having enough docks for shipping and receiving, storing the commodities in suitable conditions, and providing enough workspace to evaluate and compile onward shipments (USAID/Deliver, 2014).

As the importance of warehousing increases for the accomplishment of numerous businesses, it makes them subject to rising needs in terms of cost, productivity, and client service. Likewise, warehouse tasks have grown more complicated as a result of innovations like services that add value, electronic commerce, and up-scaling warehouses (Faber, 2015a).

In a company's cost of sales, warehousing accounts for 2% to 5%. In the extremely competitive globalbusiness world of today, firms place a strong emphasis on the yield of investment. Thus, decreasing warehousing costs takes emerged as a crucial corporate concern. Several businesses are computerizing their fundamental warehousing tasks to boost output rates or inventory opportunities necessary for their warehouse proceduresto be cost-effective (More, 2016).

Both significant and minor warehousing errors can cause significant costs. Inappropriate storage can harm the products. If the defective products are marketed, they will probably be at a large discount or none at all. The producers should not be allowed to pay back their expenses.

If the goods are not delivered to the proper locations, the company will have to pay additional delivery fees to both bring back the incorrect products and distribute the correct ones. Stays might cause harm to the items and make the intended recipients reluctant to accept and pay for the delivery. Wrong warehousing can also make the prices of commodities unstable, which is another negative effect.

In response to research carried out on the agencies supply chain operations, these activities have many drawbacks such as weak communication, insufficient warehouse infrastructure, poor fleet management procedures, inadequate working equipment, and non-professional drivers managing medications (Teketel, 2017).

According to the World Health Organization, having access to medical care is a fundamental human right. With a Pharmaceutical fund and supply agency, the government of Ethiopia is working to make medications affordable and available to all citizens. The organization strives to give the correct drug at the correct time at a lower price. However, issues persist due to the nation's rising need for pharmaceutical items and the inefficiency of the current distribution system (Getachew, 2018).

To accomplish the objectives outlined in the Goals for the Millennium, the Ethiopian government has created several initiatives and plans. Conversely, the assessment of the Programme for the Development of the Health Sector (HSDP) I and II revealed that the country's pharmaceutical Mechanism for managing commodities has been impacted by numerous issues, including stock outs, affordability, insufficient storage, inventory control, and unreasonable Consumption of drugs.

So the aforementioned findings indicate a problem with the inadequate storage of pharmaceuticals in the warehouse. Helping the company with corresponding investigations will improve the storage practices of the Ethiopian pharmaceutical supply agency. However, the intention behind performing this investigation is to attempt to address this gap by examining the impact of warehousing practices on Warehouse performance. The organization is currently functioning to enhance its activities by driving change creativity into practice, such as by exercising a center of excellence, Quick Win, buying over 57 covered cars for the transportation of pharmaceuticals, maintaining warehouse floors following WHO standards, installing security cameras at storage, and installing disposal incinerators at eight different sites across the nation. Even though attempts are being made to find solutions, there are still gaps that need to be closed.

To enable the agency's outbound logistics to be efficient and enable prompt pharmaceutical delivery with higher responsiveness. This study contributes to the usefulness of warehousing practices that increases Warehouse performance over the recommendations of the study. Once the central EPSS expands its Warehousing Practice

results in delivering the correct product in the right amount to the correct client at the correct location and increases the Responsiveness of the hubs and customers provided by the central EPSS.

1.3 Basic Research Question

The following primary research questions are suggested:

- What is the effect of Pharmaceutical receiving practice on the warehouse performance of EPSS?
- What is the effect of Pharmaceutical storage practice on the warehouse performance of EPSS?
- To what extent does Pharmaceutical put-away practice affect the warehouse performance of EPSS?
- To what extent does the Pharmaceutical order-picking practice affect the warehouse performanceof EPSS?
- What is the effect of Pharmaceutical dispatching practice on the warehouse performance of EPSS?

1.4 Objectives of the Study

1.4.1 General Objectives

The general objective of the study is to examine the effect of Pharmaceutical Warehousing Practices onwarehouse Performance at Ethiopian Pharmaceutical Supply Service.

1.4.2 Specific Objectives

The specific objectives of the study are

- To find out the effect of Pharmaceutical receiving practice on the warehouse performance ofEPSS.
- To identify the effect of Pharmaceutical storage practice on the warehouse

performance ofEPSS.

- To determine the effect of Pharmaceutical put-away practice on the warehouse performance ofEPSS.
- To describe the effect of Pharmaceutical order picking practice on the warehouse performanceof EPSS.
- To explain the effect of Pharmaceutical dispatching practice on the warehouse performance ofEPSS.

1.5 Significance of the Study

This study will examine the effect of warehouse practices on the warehouse performance of pharmaceuticals. This study will look at how pharmaceutical warehouse performance is impacted by warehousing practices. Managers can improve their understanding of warehouse practices by using the study's findings. The study's findings will be beneficial to the organization in taking the required steps to strengthen the supply chain warehouse Management. Because there has been little previous research in this field, thisresearch report provides some guidance to other researchers for their future inquiries.

1.6 Scope of the Study

To make the study manageable, this study's focus has been limited to evaluating the topics being discussed conceptually, methodologically, and geographically.

Conceptually, the study concentrates on the association between warehouse performance and warehousing practices (receiving, put-away, Storage, order picking, and dispatching). The researcher analyzed the effect of receiving, storage, put-away, order picking, and dispatching on warehouse performance. Additionally, the investigation examined warehouse performance in terms of quality, cost and financial aspects, productivity, and responsiveness.

Geographically; the study focused on the Effect of warehousing practices on warehouse performance in the Ethiopian Pharmaceutical Supply Service in Addis Ababa.

Methodologically; this study has been conducted based on an explanatory research design.

1.7 Limitations of the Study

Every study article has its own particular set of limitations because of the diverse settings and conditions. Two expected issues affecting this study were the lack of reference materials, which have been used in previous studies on topics similar to this one, and the time constraint.

1.8 Operational definition of key terms

The term "warehousing" refers to activities that encompass the large-scale, organized storage of goods and quick availability of them when needed. In other words, warehousing is the act of maintaining enormous quantities of items from the point of manufacture or purchase until their final use or sale (Frazelle, 2002).

- Receiving: this is a procedure that entails assigning trucks to docks, planning and carrying out unloading activities to schedule the carrier, unloading the vehicle, and checking for damage (Kusrini, 2018).
- Put-away is the procedure of keeping the bought product or commodity in the storage area (Frazell, 2002).
- Storage is the movement of items from the unloading place to their designated place
- Order picking is the procedure of obtaining products from the storage area in a pallet, case, or broken case form as specified by a client order (Faber, 2015b).
- Shipping/dispatching is the process of assigning trucks to pick up orders through automated loading, carrier schedules, and vehicle loading (Stoltz et al., 2017).
- Pharmaceuticals, which also include medical equipment and supplies, are any

compound used for the therapy, protection, or prophylaxis of a disease

- The warehouse is a location where in the supply chain where goods are gathered to reduce transportation expenses, produce economies of scale in manufacturing or purchasing, provide value-added services, and shorten customer response times (Ramaa et al., 2012).

1.9 Organization of the Study

The research was structured into five sections. The first section includes an introduction that includes the background of the study, with a focus on Pharmaceutical warehouse Practices in particular and warehouses in general, as well as a statement of the problem, research question, and objective, in addition to the importance of the study, its scope, its limitations, and a definition of key terms. A theoretical and empirical evaluation of the literature are used in the second chapter to propose the conceptual framework as it examines the literature on Pharmaceutical Warehousing Practices.

The research methodology is covered in the third chapter. It includes a description of the study area, research approach, research design, population and sampling, data collection techniques, data analysis, validity, reliability, and ethical issues. Presentations of the data, their interpretations, and their discussion are found in the fourth chapter, while a summary, conclusion, and recommendations, in addition to suggestions for additional research, are found in the fifth chapter.

Chapter Two

2. Related Literature Review

2.1 Theoretical Literature Review

This section reviews the literature on warehousing Practices. It contains the effect of warehouse practice on warehouse performance that highlights the process of Receiving, Put-away, Order Picking, Dispatching, and storage process. It also presents the conceptual model.

2.1.1 Definition of Warehouse Management

Warehouse

A warehouse is a facility in the supply chain to consolidate products to reduce transportation costs, achieve economies of scale in manufacturing or in purchasing or provide value-added processes and shorten response time. Warehousing has also been recognized as one of the main operations where companies can provide tailored services for their customers and gain a competitive advantage. There are many different kinds of warehouses. They can be categorized according to their roles in the supply chain as raw material warehouses, work-in-progress warehouses, finished goods warehouses, distribution warehouses, fulfillment warehouses, local warehouses for client demand, and value-added service warehouses (Ramaa et al., 2012).Some warehouses have a fully automated system for moving goods from one location to another, including automated conveyors, automated storage and retrieval equipment, and software for logistics automation. A database-driven computer program called a warehouse management system (WMS) manages the tracking of items in an automated warehouse. By keeping precise inventory levels while taking into account warehouse transactions and directing put routes, logistics staff uses WMS to increase the efficiency of the warehouse (Richards, 2017).

The objective of a warehouse is to satisfy customers with effective resource utilization and deliver the right product, the right place and at the right time in good condition. The warehouse is a means of providing functions of temporary storage, protection of goods, the fulfillment of individual customer orders, packaging of goods, after-sales services, repairs, testing, inspection, Just in Time (JIT) sequencing, and assembly.

Receiving, picking, storage, and shipping are the four main categories of warehouse operations. The storage function has several related components, including zoning and the assignment of departments or places. Additionally, batching, routing, and sorting have been taken into account as components of the picking process (Shah and Khanzode, 2017).

Warehouse is more than just a place where inventories are stored. The aims of warehouse management are to increase productivity and accuracy, and reduce and control the cost of inventory and shipping while providing good customer service (Karim et al., 2018).

2.1.2 Role of Warehouse in Supply Chain

In the whole process of the supply chain, warehousing facilities are crucial. It is certain that as globalization continues, strategies, roles, and responsibilities for warehouses will continue to shift in response to changes/challenges in reverse logistics, environmental sustainability, information technology, and overall supply chain integration. The performance of the entire supply chain is directly impacted by the efficiency of warehousing, which is also costly in terms of manpower, space, and other resources required (More, 2016).

As a component of an extensive supply chain or system, warehouses are typically a component, and as a result, supply chain coordination regularly affects or even regulates the volume of shipments needed from andreplenishments received at a

warehouse. Warehouses will be able to respond to customer demands more swiftly than ever before by offering value-added services including customization, small-scale assembly, labeling, kitting, and customized packaging.

As e-commerce expands in popularity, warehouses are being forced to handle a rising volume of tiny orders that must be handled in a short amount of time, significantly complicating warehouse operations.Companies have either chosen to consolidate their warehouse operations into one or a few large centralized warehouses with high throughputs in response to these developments, particularly chain management initiatives or have chosen to contract out their warehouse operations to newly emerging trained logistics firms (Faber, 2015a).

Products are repackaged and reorganized in a warehouse. Products are often packaged larger when theyarrive and smaller when they leave. In other words, this warehouse's crucial job is to cut up enormous product chunks and distribute them in reduced amounts. For instance, even when some stock-keeping units arrive at the vendor or manufacturer on pallets, they may still be shipped to customers in case of quantity (Bartholdi and Hackman,2011).

Because warehouses play a crucial role in the supply chains in which they participate, current trends including rising market volatility, a proliferating product offering, and shortened customer lead times all affect the functions that warehouses must carry out. To meet the specific needs of the whole supply chain, warehouses must be designed and operated accordingly. They are therefore justified in circumstances when they are a part of the least expensive supply chain that can be created to match the service levels that must be provided to customers. Warehouses are sometimes one of the most expensive components of the supply chain due to the nature of the facilities, personnel, and equipment needed, thus it is crucial to manage them successfully from a cost and service perspective (Rushton et al., 2022).

2.1.3 Warehousing practices

Typically, a warehouse is separated into functional sections that are created to simplify the movement of materials. The receipt area, storing area, and shipment area are the threemain warehouse areas. Then, the received items are either transported directly to the shipping area or a storage facility. Items are sorted, combined, and put into carriers in the shipping area. Although this describes the broad flow of materials in a warehouse (Bartholdi and Hackman, 2011).

2.1.3.1 Pharmaceutical Receiving

Receiving may begin with advance notification of the arrival of goods. This allows the warehouse to schedule receipt and unload to coordinate efficiently with other activities within the warehouse. Once the product has arrived, it is unloaded and possibly staged for put away. It's likely to be scanned to register its arrival so that ownership is assumed, payments dispatched, and so that it is known to be available to fulfill customer demand. The product will be inspected for any exceptions noted, such as damage, incorrect counts, wrong descriptions, and soon. Just 10% of operating costs in a typical distribution facility are spent on receiving (Bartholdi and Hackman, 2011).

Receiving commodities comes first in the chain of warehouse operations. This technique doesn't take as long as picking, which is demonstrated farther on, but it is just as important. Especially if improper put-away results in problems in subsequent processing. The notification of the arrival of the items can start the receiving process. This enables the warehouse to plan and schedule incoming activities so that there are no unplanned events. Unloading starts as soon as the units arrive, followed by accurate documentation (Habazin, 2017).

Receiving items in a warehouse is an operation that requires careful planning. To assign the proper resources to the activity, incoming vehicle loads are typically scheduled in advance at large warehouses. When the goods are unloaded, they are typically inspected to make sure they are the right ones and are of the necessary

amount and quality. If products need to be quarantined (stored, for example, until quality control results are available), thiscan be done by putting the items in the regular reserve storage area and utilizing the warehouse management system to make sure that the goods are not picked for any special orders (Rushton et al., 2022).

2.1.3.2 Pharmaceutical Put-away

Put-away process may require a large amount of work because SKUs must be moved over significant distances to their storage position. Put-away accounts for approximately 15% of warehouse operating costs (Kusrini et al., 2018). Every Stock Keeping Unit (SKU) in a warehouse has its own location, determined in advance, whether the positioning is predefined or random. Precisely, there are several storage policies. A predefined storage policy prescribes a particular location for SKU to be stored, but a random policy leaves the decision to the operator. Both of these storage policies can be used in some warehouses. Furthermore, a class-based storage system allocates zones to a specific product which is based upon products turnover rate as ABC zoning.

Before the product can be stored, an appropriate storage location must be selected. This is important since the operator's ability to promptly and affordably collect the product for a client depends on where the commodity is stored in the warehouse.

The storage options' size, weight capacities, and other specifications must be kept in mind at all times by the operator. When a product is stored, the storage area should also be scanned to document where it was put. Then, using this data, efficient pick lists will be generated, guiding order pickers in identifying the item for customers. Put-away can take time because the items may need to travel a long way to the storage location. Typically, 15% of operating costs for warehousing are attributable to put-away costs (Bartholdi and Hackman, 2011).

2.1.3.3 Pharmaceutical Storage

Storage is the actual containment of goods as they wait for a need. The storage strategy is determined by the size, number, and handling characteristics of the inventory items as well as the item or its packaging (Frazelle, 2002).

Items are positioned in storage areas throughout the storage procedure. The storage area can be separated into two sections: the reserve area, where products are held most economically, or the bulk storage area and the forward area, where commodities are kept for order pickers to quickly access.

Frequently, lesser quantities of products are kept in conveniently located storage units in the forward area (Gu et al., 2007). Storage is the process of arranging the products kept in the warehouse to maximize space utilization and enable effective material handling. Storage items may be categorized into various departments. A variety of departments can be created for goods in storage. The distribution of items to the storage area makes up these operations (Karasek J., 2013). Typically, goods are transported to the reserve or backup storage area, which occupies the majority of space in many warehouses and contains the majority of warehouse inventory in clearly marked places. When necessary, the items are moved from reserve storage to either marshaling right away (for example, if aconsumer requires a full palate) or to restock a picking station (Baker, 2007).

2.1.3.4 Pharmaceutical order picking

Order picking is a primary goal of most warehouses: to accurately, promptly, and in good condition select from inventory the specific commodities needed by customers and combine them into a single shipment. This activity is critical in that it directly impacts customer service, as well as being very costly. Order picking typically accounts for about 50 percent of the direct labor costs of a warehouse.

To fulfill a customer order, order picking (pallet, case, broken case) entails locating the goods they need in the storage area. Order lines make up customer orders, with

each line designating a distinct SKU in a specific amount. When a customer requests full pallet quantities, pallet picking includes locating complete pallet loads.

The requested number of units of a product during the picking process can be less than the number of units in a case (broken case picking), equal to or a multiple of the number of units in a case (full case picking), or as many units as there are on a pallet (pallet or bulk picking) (Faber, 2015a).

2.1.3.5 Pharmaceutical Shipping /Dispatching

The last process in the sequence of warehouse processes is shipping. Consolidating units afterpackaging them and getting them ready for shipping is the initial step, with the premise that the shippingoptions have already been planned. Though there may be some extra tasks if the product is stagedbefore being loaded, this process is not as labor-intensive and generally requires less effort than the previous one. Also included in the outgoing zone is control, which typically requires at least one warehouse employee to offer the activity. Control can be done manually or with the aid of a scanner, depending on the warehouse information system (Paul and Lestari, 2015).

After order picking, the products for a specific order must be assembled and prepared for shipping. This could entail value-added tasks including labeling, assembling, testing, and packaging into boxes. These actions may be fairly significant where production postponement is implemented (Rushton et al., 2022).

Once the items are sorted into vehicle loads, they must be loaded into or onto unit loads to be dispatched.A powered pallet truck may be used to transport the items to the marshaling area in a normal manner (such as by loading the goods onto roll-cage pallets). Stretch-wrapping or shrink-wrapping the entire pallet in the case of items being shipped on a pallet will prevent the products from shifting while in transit. By preloading switch bodies or drop trailers in the hours before the dispatch timings, this can be mitigated (Rushton et al., 2022).

2.1.4 Warehouse Performance

Warehousing is one of the elements that contribute to an organization's ability to compete. Businesses compete based on their performance in terms of money, production, quality, and turnaround time. Therefore, it's critical to hold warehouses responsible for the success of theseinitiatives. There are four quality indicators for warehouse performance: Put away accuracy (the percentage of items put away correctly), Inventory accuracy (the percentage of warehouse locations without inventory discrepancies), Picking accuracy (the percentage of order lines picked without errors), and Shipping accuracy (the percentage of order lines shipped without errors) (Frazelle, 2002).

The idea of dynamic storage, which can increase order throughput and lower labor costs at the same time due to shorter picking travels (Yu and De Koster, 2010). Following these two studies, if storage practices are less effective than what the supply chain system anticipates, warehouse performance will be impacted.

Table 2.1: Warehouse performance indicator

Quality Indicator	**Response Indicator**	**cost /financial Indicator**	**Productivity Indicator**
Inventory Accuracy Rate	Warehouse Order Processing Time	Total Warehousing Cost	Storage Space Utilization
Put-Away Accuracy	Put-Away Time	Value of Product Damaged/ expired in the Warehouse	
picking Accuracy Rate			

Source: modified Adoption from (Aronovich et al., 2010)

Quality

- Inventory Accuracy Rate

  This indicator figures out the percentage of storage or warehouse locations for a specific period where physical inventory counts were compared to stock cards and there were no inconsistencies in the inventory.

  Inventory accuracyis crucial for managers to know how much stock they have at any one time and when to place a fresh order to replace stock. Managers can identify storage facilities that struggle with inventory control usingthis discrepancy analysis, which can also reveal areas for development (John Snow, 2017).

- Put-away Accuracy: The proportion of items in a warehouse or storage space that are put in the right location or bin acts as this indicator. This indicator evaluates a facility's capacity to stock products in the proper position where they may be found conveniently and promptly. This can show whether the staff is following appropriate warehousing procedures and rules (John Snow, 2017).

- Picking Accuracy Rate

  This measurement represents the percentage of products or lines that are appropriately selected from storage (i.e., the right ones and in the right quantities based on a request or packing list) and then placed into the appropriate container. This indicator evaluates the accuracy with which things are taken out of storage and put into a containerto be sent to the facility that requested them.

It can demonstrate the facility's capacity to accurately pickorders in terms of quantity and item. Stock outs or overstocks at the ordering facility may occur as a result of errors (John Snow, 2017).

Response Time

- Warehouse Order Processing Time

This indicator determines how long it usually takes to deliver an order from the time it is received at the storage facility until it is delivered to the client (e.g., minutes, hours, days, or weeks). The average order processing time for a given shipping facility, for orders going to a particular customer, or for a particular product can be computed. This metric aids in keeping track of a shipping facility's effectiveness and order processing performance. Additionally, it aids in locating areas where staff performance in order management and reaction time can be enhanced (John Snow, 2017).

- Put-away Time

This metric determines how long it requires for a product to move from being unloaded from a vehicle to being placed in a warehouse or other type of storage facility to be placed in its designated spot and prepared for pickup.During a given period, this indicator might be measured by goods or shipments, or as an average acrossall items or shipments. By keeping an eye on the effectiveness of the put-away procedures and the personnel in charge of the task, measuring the put-away time can assist increase productivity. It can assist managers in identifying procedures or working conditions that need to be improved, as well as the requirement for staff training (John Snow, 2017).

Cost/Financial

- Total Warehousing Cost

The total warehousing costs collect all costs related to warehousing, such as labor costs and warehouserent; mortgage payments, utility bills, equipment, material and information handling systems, etc.

It also includes costs related to systems, supplies, and any other material with a specific use in warehousing. This indicator is typically assessed once a year. This indicator can also be stated as the total warehousing cost per piece or line by dividing the total cost of warehousing by the number of units that are stocked, the volume of those units that are stocked in cubic meters (m3), per storage space (m2), or program.

Using this indicator, managers may keep tabs on the costs of various parts in a warehouse and assess costs in various storage facilities. It can lead to an analysis of best practices and can assist in locating the warehouses that are the most cost-effective.

It can also be used to determine storage usage, cost-effectiveness, etc. by dividing total warehousing costs by units or area. This indication gives the management team very good detailed cost visibility byseparating the warehousing costs by SKU (John Snow, 2017).

- **Value of damaged and expired in the Warehouse**

Determines the value of goods that are affected, expiring during a specified period (often one year), and being stored as a proportion of the total value of goods moved throughout that period, the number of goods in the warehouse. Damageto inventories may result from improper product handling or warehousing conditions. This indication can be used to determine the reasons why a product has been damaged, as well as the steps that must be taken to prevent it, such as better infrastructure,

manpower, training, etc., as well as to assist put the worth of the productsthat have been damaged into perspective (John Snow, 2017).

Productivity

The amount of using a storage area as a percentage of the overall volume of storage is known as space utilization. Managers can keep an eye on a warehouse's storage capacity and utilization basedon this indicator. By analyzing how much storage space is being used, managers can identify ways to increase storage capability (e.g., eliminate expired products, de-junk, or reorganize) and make the most of the available space, or they can ask for a review of the layout, material flow, shelf placement, etc (John Snow, 2017).

2.1.5 Empirical Review

2.1.5.1 Receiving

According to the finding of Buzu (2021), The Effect of Warehouse Management on Warehouse Performance shows that the receiving activities in the organization are properly carried out concerning the receiving warehouse of the organization, such as cross-checking documents with incoming goods, notifying incoming goods in advance to prepare the warehouse, minimizing physical accidents on received goods, and adhering to standard operating procedures and guidelines that help to receive goods into the warehouse, but the shelves in the organization are inadequate. Receiving and warehousing performance have a positive and significant correlation, demonstrating that there is an association between the two variables. The positive correlation shows that enhancing receiving for warehouse management enhances the organization's warehouse performance. This suggests that receiving a warehouse has a strong positive impact on the organization's warehouse performance.

According to the finding of Hailu (2019), The Effect of Warehousing Practices on Organizational Performance shows The current reception activity, which entails standard carrier processing such as Unloading, product verification, documenting the

receipt of the products, quantity, and quality checking, unpacking, and sorting are all acceptable. The performance of a company referring to (Time, Quality, Cost, Productivity, and Customer Satisfaction) is significantly correlated with its receiving activity. The statistical impact of receiving action on organizational performance is determined to be statistically beneficial and substantial.

2.1.5.2 Put Away

According to the finding of Buzu (2021), The Effect of Warehouse Management on Warehouse Performance demonstrates that there are sufficient activities forput away the organization's warehouse, such as having the necessary tools and a layout that makesit easy to put the warehouse away, as well as a design that makes it simple to load and unload the organization's items. The positive and significant association between put-away and warehouseperformance shows that there is an association between the two variables. Positive and significant coefficient of put away. The coefficient's positive sign implies that an organization's warehouse performance will rise as it is put away, and vice versa. This implies that put away has a positive impact on the organization's warehouse performance.

According to the finding of Hailu (2019), The Effect of Warehousing Practices on Organizational Performance Indicates Put-way activity and organizational performance in terms of (Time, Quality, Cost, Productivity, and Customer Satisfaction) are significantly correlated.

2.1.5.3 Storage

According to finding of Buzu (2021), The Effect of Warehouse Management on Warehouse Performance: The Case of Modjo Dry Port in Ethiopia demonstrates how poorly the organization's issue is handled in terms of storage activities by warehousing management. The organization is improperly utilizing the storage spaces that are available to keep goods; the shelves, racks, and pallets are not organized in lines to assist put-away and picking activities in the organization's storage warehouse, and the materials held in storage are not stored according to a codification.

Storage and warehouse performance have a positive and significant correlation, indicating that there is a relationship between the two variables. The coefficient's positive sign implies that if storage increases, warehouse performance for the organization also increases, and vice versa. This suggests that the organization's warehouse performance is being positively impacted by storage.

According to the finding of Hailu (2019), The Effect of Warehousing Practices on Organizational Performance the present storage Working with the management of materials and goods is an activity ofMWE's current practice. Considering storage operations serve as the focal points for the exchange of goods and data between supply sources and beneficiaries. Storage activity and organizational success in terms of (Time, Quality, Cost, Productivity, and Customer Satisfaction) are strongly correlated

2.1.5.4 Order Picking

The trade-offs between order responsiveness and picking efficiency, examined using various stochastic problems (Worker extra hours, early arrivals, absences, penalties, time constraints for placing orders, and the price, etc.). Numerous studies have also been identified that focus just on effectiveness, but an integrated approach that also takes responsiveness into account can yield superior outcomes (Shah & Khanode, 2017).

According to Habazin (2017), the order-picking procedure in warehouses is the one that consumes the majority of operational costs and takes the longest to complete. This is true of all warehouse processes, from receiving to shipping as well as order picking. As soon as the picker begins picking items from orders, walking, traveling, carrying them, placing them, assembling them, and doing other related work, these activities require time, which results in expenses.

The order picking procedure has been examined concerning the specific process flow and time allotted for its execution to carry out a suggestion of a remedy. It has the potential to be lowered througha variety of methods depending on its status.

Companies that are willing to improve their processes typically measure them as well as have an impartial view of the fundamental process architecture. Any process optimization must prioritize being flexible and doing ongoing evaluations. It is believed that the processes would operate more effectively if order picking was optimized as suggested.

According to the finding of Hailu (2019), The Effect of Warehousing Practices on Organizational Performance This indicates that the recent Order-picking activity at MWE demonstrates that manpower and necessary components are required to remove a product from inventory and fulfil a customer's order. Order-picking activity significantly correlates with organizational performance in the context of time, Quality, Cost, Productivity, and Customer satisfaction. Similarly, there is a moderate correlation between order-picking activity and organizational performance. The activity of picking orders has been discovered to have statistically beneficial but negligible effects on organizational performance.

2.1.5.5 Shipping /Dispatch

According to the finding of Buzu (2021), The Effect of Warehouse Management on Warehouse Performance demonstrates the organization's commitment to protecting the safety of the goods; customer orders are packed in a way to guard against harm while in route; communications are made to prepare for transportation and to inform the recipient; and goods are shipped to customers following their specifications and are delivered on time and undamaged. The positive and significant correlation between shipping and warehouse performance suggests that there is an association between the two variables. The coefficient's positive sign implies that if shipping and dispatch increase, warehouse performance for the organization also increases, and vice versa.

This suggests that the company's warehouse performance is being positively impacted by shipping and dispatch. According to the finding of Hailu (2019), The Effect of Warehousing Practices on Organizational Performance shows, the modern Put-way Activities of MWE that show the packaging of useful goods for delivery to consumers and the loading of such goods onto trucks for delivery to the customers are essential. Shipping activity and organizational success in the context of time, Quality, Cost, Productivity, and Customer Satisfaction) are significantly correlated.

2.6 Conceptual Framework

A conceptual framework is a collection of related ideas about how a phenomenon functions and how it is related to its constituent parts. Using the conceptual framework, the association betweenthe independent variables and the dependent variable is examined. According to the aforementioned literature and problem statement, logistics performance is the dependent variable, and receiving, put-away, order picking, storage, and dispatching are the independent variables. The graphic below represents the relationship diagrammatically.

Independent Variable Dependent Variable

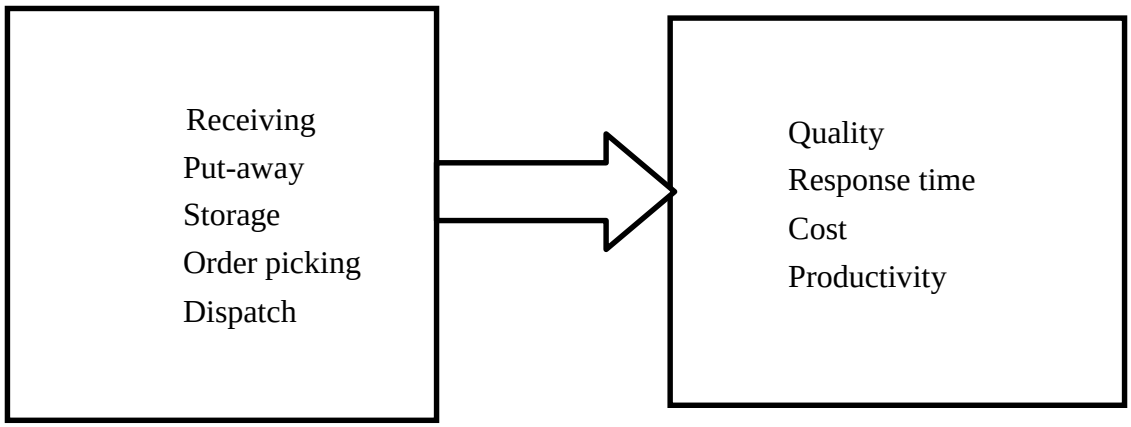

Figure 2.1: Conceptual framework

Source: A modified adoption from (Frazelle, 2002)

Chapter Three

3. Research Methodology

This section concentrated on the general methods utilized in a research project to gather pertinent datafor the study's goals. A description of the study area, a research approach, a research design, population and sampling, and data analysis make up the technique.

3.1 Description of the study area

The Ethiopian Pharmaceutical Supply Service is a government-run organization that procures all typesof medicines, medical equipment, medical supplies, laboratory reagents, and chemicals from national and international manufacturers and suppliers and distributes them to the government Health facilities through its 19 branches across the country.

The Organization is in charge of the entire healthcare supply chain for the public sector, which includes forecasting, purchasing, storing, and distributing medications, medical supplies, diagnostic chemicals and reagents, and medical equipment. Today, its operations generate close to $1 billion in yearly revenue.

The two directorates of the EPSS head office, WIM, and DFM, were the study locations for the thesis.There are four teams under the two directorates that are coordinated as a department or team. These comprise the fleet management team, distribution team, inventory management team, and warehousingteam (warehouse manager and warehouse officer).

3.2 Research Approach

The study adopted a quantitative research approach to produce numerical data that can be converted intonumbers, with an emphasis on counting and classifying aspects as well as developing statistical tools and figures to characterize what is observed through structured questionnaires or techniques.

3.3 Research Design

To establish a causal relationship between variables and to understand how one factor influences or brings about changes in another factor, the study was started to understand a condition or problem. Explanatory research uses a study design to ascertain what is occurring, why it is occurring, and what can be done to address it. To investigate the effect of pharmaceutical warehousing practices on warehouse performance, the focus of this study was on an explanatory research design.

3.4 Population and Sampling

3.4.1 Target Population

The study's target participants included staff (officers, warehouse managers, team leaders, technical advisers, and directors) that are directly involved in warehousing Management Practices. As a basis, the study's candidates are units of the population, with a sample size of 100 participants.

3.4.2 Sampling

The whole range of variables from which the investigator seeks to conclude is referred to as the target population. Thepopulation, on the other hand, discusses the general group of individuals, occasions, or objects of interestthat the investigator seeks to look into. The problem and goals outlined in the problem statement should be clear, as should the target group to which the findings apply.

Because of the very small number of people (100) in the study area, the sample size was takenas 100 respondents to conduct the survey. So, to provide the necessary and pertinent information on thequantitative data a census population sampling technique was used in this study.

3.5 Source of data

3.5.1 Primary Source

Primary data was collected from directors, technical advisors, team leaders, and officers who were directly involved in the warehousing practices of pharmaceuticals using structured questionnaires, which were only closed-ended questions.

3.5.2 Secondary Source

Journals, SOPs, reports, and any other documents that the researcher comes across while gathering data and thinks are beneficial in enhancing the research were considered secondary sources of data in this study.

3.6 Data Collection Instruments

The gathering of data took into account current warehousing practices and their impact on warehouse performance, which was examined using an organized survey based on a 5-point Likert scale score system With a score of 1 (strongly disagree) to 5 (strongly agree).

The research instrument had been designed clearly and was free from any ambiguity to achieve the specified study outcome. The research instrument was created with complete clarity to satisfy the stated study objectives. Before beginning data collection, the chosen participants were contacted for their permission. Following confirmation of participant willingness, each respondent received the prepared, self-administered, structured questionnaire. After a predetermined period,questionnaires were collected, and respondents were thanked for their involvement and their valuable time. To gather information about the effects of warehousing practices on pharmaceutical warehouse performance, a document review was carried out. The main data was gathered from the study's participants, and consequently, the collected data was tested for completeness and consistency earlier starting the analysis. There were two elements to the questionnaire that was proposed and used in this

investigation. Part one of the study looked at demographics, while part two looked at pharmaceutical warehousing practices and the performance of pharmaceutical warehouses.

3.7 Data Analysis

The method of data analysis entails a variety of choices and distinct actions, some of which may be peculiar to a given research topic. Data analysis, in particular, entails several tasks that may call for theuse of different statistical methods in various contexts. To start, the gathered data were reviewed for accuracy, uniformity, and comprehensiveness. All quantitative data collected from respondents were analyzed and coded by using SPSS (Statistical Package for Social Science (SPSS) version 26. The study's findings included frequency distribution, percentage, mean, standard deviation, Pearson's correlation, Analysis of variance, and bivariate analysis to explain the relationships between the different variables tested in this study. Descriptive statistics teaches us how to present information numerically and graphically to get a broad view of the information gathered.

According to the study, Pearson's correlation and multiple regression analysis, which includes Anova and asummary model in inferential statistics, were used to analyze both associations and the effects of warehousing practices on warehouse performance.

3.8 Validity and reliability

3.8.1 Validity

By testing the validity, readability, clarity, and ambiguity of the statements and questions, the data collection tools were piloted on a sample of the respondents to make sure the questionnaires are valid. Through the pilot study, the investigator was capable to clarify several terminologies, and the instruments were changed as a result.

3.8.2 Reliability

Only variables with multiple measurement questions can be used to calculate Cronbach's alpha, a reliability indicator that measures the variance in the true score of the underlying construct that has been accounted for. Cronbach's test has been carried out to verify the instrument's reliability. Reliability is the trend toward consistency exhibited in repeated measurements of the same phenomenon. The extent to which all of the items on a scale measure distinct aspects of the same property is referred to as internal consistency. Cronbach's alpha standard ranges from 0 to 1, and a valueof 0.7 or higher is considered internally consistent or sufficiently reliable data (Deniz and Alsaffar, 2013).

Table 3.1: Reliability test

No.	Variables	Number of items	Cronbach's alpha
1	Receiving	10	0.848
2	Put away	7	0.837
3	Storage	8	0.91
4	Order picking	4	0.836
5	Dispatch	3	0.891
6	Warehouse Performance	11	0.88
Total		**43**	**0.867**

Source: SPSS own survey (2023)

The results showed that all variables had Cronbach's alpha values over 0.70, as shown in the tableabove. All variables are therefore internally consistent and sufficiently reliable.

3.9 Ethical Consideration

AAU SOC was requested official permission to conduct the study from the organization (EPSS) before starting data collection. Before any individuals are enrolled as respondents in the study, their consent was requested before the research instrument is distributed to them. Interviewers will outline the purpose, scope, and anticipated results of the study to participants during data collection. All information obtained from participants was handled ethically, without distorting the individuals' initialconcerns, and was kept confidential.

Chapter Four
Data Analysis, Results, and Discussions

The objectives of the study, which were discussed in the first section, are followed by the data analysis that was gathered in this chapter and that was gathered here in the following section, which also covers the findings. The warehouse unit, inventory management unit, distribution unit, and fleet management units of the organization provided all of the data directly to the personnel who worked there.

Before the data was transformed into a numeric format, data coding was prepared to represent every item and variable in the gathered information. To investigate, assess, and display the findings, graphs, tables, frequency distributions, and percentages were used when the data coding was complete with the assistance of SPSS Version 26.

The Socio-demographic Data of Respondents is shown in the first portion of the survey. The second half includes an assessment of the EPSS's warehousing practices, while the last Section contains the study of the correlation and regression among independent and dependent variables. The Statistical Package for Social Science (SPSS Version 26) was used to analyze the data that had been obtained.

4.1 Response Rate of the Study

The response rate is defined as the proportion of legitimate responses to all eligible respondents in the targetdemographic. The study showed that 94 out of 100 questionnaires were correctly filled out and returned for processing, giving the study a 94% response rate. Three (3%) of the questionnaires are incomplete, and three (3%) have not been returned. With a response rate of 80% or higher, the researcher may generally generalize that its representations of the target population are suitable and acceptable (Fincham, 2008). As a result, 94 questionnaires were deemed sufficient because they were beyond the usual threshold of response rates.

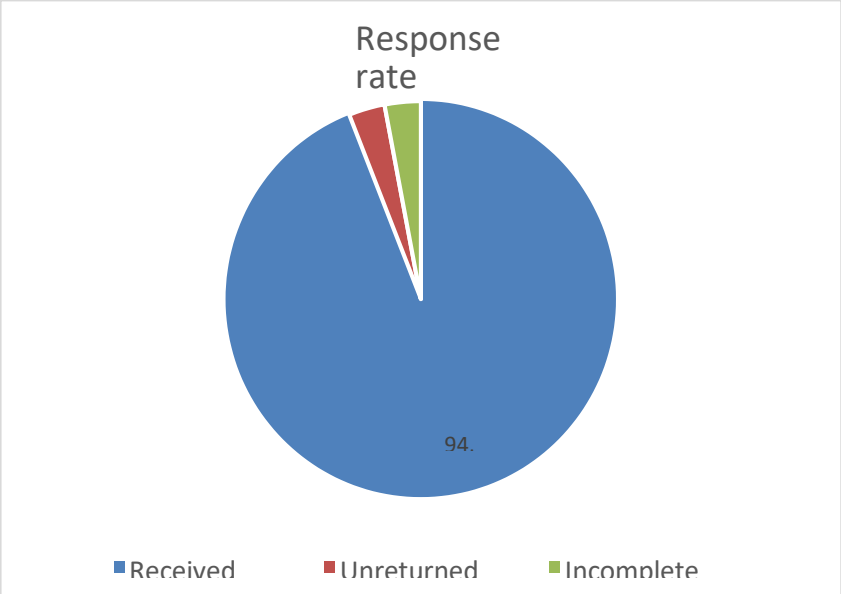

Figure 4.1: A response rate of the study

Source: SPSS own survey (2023)

4.2: Socio-demographic characteristics of the respondent

Participants were requested to fill in their socio-demographic information including Gender, Age, Educational Qualification, Year of Experience, Working Directorate, and job position, and correspondingly the result is depicted here in the Table below.

Table 4.1: Socio-Demographic information

Socio-demographic Character	Sub Category	Frequency	Percent (%)
Gender	Male	60	63.8
	Female	34	36.2
Age	Less than or Equal to 30 Years	42	44.7
	31-40 Years	45	47.9
	41-50 Years	7	7.4
	Above 51 Years	0	0
Educational Qualification			
	Diploma	20	21.3
	Degree	57	60.6
	Masters	17	18.1
	PHD	0	0
Year of Experience	Below 3 Years	40	42.6
	3-6 Years	20	21.3
	7-10 Years	20	21.3
	Above 10 Years	14	14.9
Working Directorate	Warehouse & Inventory Management	76	80.9
	Distribution and fleet management	18	19.1
Job Position	Director	2	2.1
	Advisor	13	13.8
	Team Leader	8	8.5
	Officer	59	62.8
	Warehouse Manager	12	12.8

Source: SPSS own Survey (2023)

According to the statistics in the table above, both men and women participated in this study, with men accounting for 63.8% of responses and women for 36.2%. Figuring out that men in the company performed more work than women, the researcher concluded from this data that there were more male than female employees.

A total of 45 (47.9%) of the replies were grouped by age group between the ages of 31 and 40, 42 (44.7%) were grouped by age group between the ages of 30 and 42, and 7 (7.4%) were grouped by agegroup between the ages of 41 and 50. The results so show that young staff made up most of the respondents.

Although the questionnaire asked about educational background up to the Ph.D. level, no responder was included in this study. However, 57 (60.6%) of the responses were from people who had receiveda degree, and this group dominated the responses. Twenty (21.3%) people had received a diploma, andseventeen (18.1%) people had received a master's degree. This suggests that everyone who responded to the survey had sufficient knowledge to comprehend it and provide a response.

Among the respondents with organizational experience, those with experience of fewer than three years dominated the others, accounting for 40 (42.6%) of the responses, followed by those with experience of three to six years, which accounted for 20 (21.3%), seven to ten years of experience, which accountedfor 20 (21.3%), and individuals who have worked for more than ten years, which made up 14 (14.9%). Thissuggests that the majority of the organization's personnel have a limited amount of job experience. As a result, despite having only a little organizational experience, they are motivated to work.

4.3 Descriptive Analysis

4.3.1. Warehousing Practices

First, the practice of warehousing at the Ethiopian Pharmaceutical Supply Service was assessed to realize the Effect of warehouse practices on warehouse performance. To study more about the organization's present warehousing Practices, respondents were asked to respond. The five componentsof warehousing practices are receiving, put-away, storage, order picking, and dispatching.

The five-point Likert scale was used by respondents to judge the current state of warehouse practices: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = highly agree. In this study, the organization's warehousing practices were investigated utilizing means and standard deviation. The mean is the sum of all simple averages across a given distribution of responses. Means are interpreted as follows: 4.5–5 = always practiced, 3.5–4.49 = very often practiced, 2.5–3.49 = occasionally practiced, 1.5–2.49 = rarely practiced, and 1–1.49 = never practiced

The standard deviation is a measure of dispersion that illustrates how near or far the opinions of each respondent are from the distribution mean. Additionally, a low standard deviation shows that the data is homogeneous, indicating that respondents' viewpoints are remarkably similar. While a high standard deviation denotes the extensive nature of the data from the distribution mean, which demonstrates a range of perspectives among respondents.

4.3.1.1 Pharmaceutical Receiving Practice

The study aimed to examine the pharmaceutical receiving practice in the Ethiopian pharmaceutical supply service, and, accordingly, its results are presented here in the table below.

Table 4.2: Descriptive statics of receiving practice

Receiving Activity	*N*	*Mean*	*Standard Deviation*
To receive pharmaceuticals properly, EPSS has standard operating procedures (SOP) in place.	*94*	*3.1*	*0.84*
There is a pre-notification of the incoming goods that will be received in the warehouses	*94*	*2.7*	*0.68*
In EPSS Warehouses, there is a distinct separate reception area.	*94*	*2.7*	*0.8*
When receiving products, there are processes for comparing the documentation with the products.	94	2.9	*0.95*
There are procedures for reporting discrepancies to vendors to return and obtain goods again.	94	2.7	*0.82*
Each member of the receiving staff has received comprehensive training in the receiving processes.	94	3.3	*0.9*
Incoming products are checked (preliminary physical inspection by using a checklist for quantity, quality, any damage, type, and expiry date)	94	2.7	*0.78*
During receiving cold chain items, the condition of cold Boxes/refrigerated truck that contains the products is well-checked to ensure the cold chain is maintained.	94	2	*1.41*
The EPSS has sufficient equipment to unload materials.	*94*	*2.7*	*0.68*
The EPSS has sufficient space for loading/unloading materials.	*94*	*2.7*	*0.8*
Grand total	*94*	*2.8*	*0.51*

Source: SPSS own survey (2023)

The table shows that to receive pharmaceuticals properly, EPSS has standard operating procedures (SOP) in place (M=3.1, SD = 0.84). It is clear from this analysis that EPSS has poor utilization of (SOP) to receive pharmaceutical properly. There is a pre-notification of the incoming goods that will be received in the warehouses (M=2.7, SD = 0.68). It is clear from this analysis that pre-notification of the incoming goods are not strictly adhered in the warehouse.

In EPSS Warehouses, there is a distinct separate reception area (M=2.7, SD = 0.8). It is clear from this analysis that EPSS has not sufficient and separate receiving area. When receiving products, there are processes for comparing the documentation with the products (M=2.9, SD = 0.95). It is clear from this analysis that in EPSS, when receiving products process for documentation is not regularly done.

There are procedures for reporting discrepancies to vendors to return and obtain goods again (M=2.7, SD = 0.82). Each member of the receiving staff has received comprehensive training in the receiving processes (M=3.3, SD = 0.9). It is clear from this analysis that receiving staff has received adequate training for receiving process. Incoming products are checked for quantity, quality, any damage, type, and expiry date) (M=2.7, SD = 0.78). The condition of cold Boxes/refrigerated truck that contains the products is well-checked to ensure the cold chain is maintained (M=2.0, SD = 1.41). It is clear from this analysis that EPSS has needs special attention while receiving cold chain product and it must check the appropriate transportation of the cold chain products.

The EPSS has sufficient equipment to unload materials (M=2.7, SD = 0.68). It is clear from this analysis that EPSS has inadequate equipment to unload materials EPSS has The EPSS has sufficient space for loading/unloading materials (M=2.7, SD = 0.8). It is clear from this analysis that EPSS has inadequate space for loading/unloading materials.

The results in the above table, which had an aggregate mean and standard deviation of (M = 2.8, SD = 0.51), demonstrated that receiving was occasionally practiced in the organization.

4.3.1.2 Pharmaceutical Put Away Practice

Accordingly, the following table displays its findings. The research objective was to examine the level of pharmaceutical Put-away practice in the Ethiopian pharmaceutical supply service.

Table 4.3: Descriptive statics of put-away practice

Put- away Activity	N	Mean	Standard Deviation
The inspected items can be kept in sufficient storage spaces, such as pallets, cabinets, and shelves.	94	3.19	0.93
Most warehouse employees possess the necessary skills to carry out put-away tasks appropriately.	94	2.14	0.775
For all items received in EPSS warehouses, there is a well-established, organized put-away process.	94	2.89	1.041
To make order picking easier, every item that is received is put in its preferred position, according to good storage practices.	94	2.68	0.8
Items are arranged by category, type, batch number, and expiry date before moving from receiving area to the storage area.	*94*	*2.93*	*0.936*
Product-specific locations are registered/recorded in EPSA warehouses after being put away.	94	2.96	0.977
The transfer of cold room items from receiving area to the cold room is always done within less than 30 minutes from the time of arrival.	*94*	*2.74*	*0.802*
Grand Total	94	2.75	0.409

Source: SPSS own survey (2023)

The table also demonstrates that the inspected items can be kept in sufficient storage spaces, such as pallets, cabinets, and shelves (M=3.19, SD = 0.93). It is clear from this analysis that EPSS has sufficient pallets, cabinets, and shelves to keep the products. Most warehouse employees possess the necessary skills to carry out put-away tasks appropriately (M=2.14, SD = 0.775). It is clear from this analysis that EPSS has given special attention for warehouse employee to carry out put away activity in the warehouse. There is a well-established, organized put-away process (M=2.89, SD = 1.041). It is clear from this analysis that EPSS has strengthen and organized Put-away process in the warehouse.

EPSS has every item that is received is put in its preferred position, according to good storage practices (M=2.68, SD = 0.8) It is clear from this analysis that EPSS has strengthen put- away accuracy and put - away products based on good storage practice. Items are arranged by category, type, batch number, and expiry date before moving from receiving area to the storage area (M=2.96, SD=0.977). It is clear from this analysis that EPSS has must strengthen segregation of products before moving from receiving area to the storage area.

Product-specific locations are registered/recorded in EPSA warehouses after being put away (M=2.74, SD = 0.802).The transfer of cold room items from receiving area to the cold room is always done within less than 30 minutes from the time of arrival (M=2.75, SD = 0.409).

The aggregate mean and standard deviation of the preceding table (M = 2.75, SD = 0.409) indicate that put away was occasionally practiced in the organization.

4.3.1.3 Pharmaceutical Storage Practice

The results of the research are gathered in the table below and were intended to examine the current state of pharmaceutical warehousing practices in the Ethiopian pharmaceutical supply service.

Table 4.4: Descriptive statics of storage practice

Storage activity	*N*	*Mean*	*Std*
To make put-away and order-picking actions easier, shelves, racks, and pallets are placed in lines with adequate passageways.	*94*	*2.96*	*0.977*
To effectively utilize storage space, non-usable items (such as products that have expired, been damaged, or have quality defects) are routinely separated from usable inventory.	*94*	*2.75*	*0.785*
For products that require further protection, there is access-controlled storage (such as a separate secured room, cabinet, or lockable wire cage within the storage facility).	*94*	*3.24*	*0.969*
Pharmaceuticals are always kept in such a way that supports the stock management principle of first-to-expire, first-out (FEFO).	*94*	*3.29*	*0.827*
The cold room's temperature is checked twice daily, recorded, and if it is outside the permitted range, it is reported for prompt action.	*94*	*2.91*	*1.01*
Storage areas are regularly inspected and cleaned.	*94*	*2.54*	*1.001*

Pharmaceuticals are kept in special storage facilities to avoid contamination, and cross-contamination.	*94*	*2.68*	*0.918*
Grand total	*94*	*2.79*	*0.409*

Source: SPSS own survey (2023)

The table also shows that shelves, racks, and pallets are placed in lines with adequate passageways (M=2.96, SD = 0.977) this implies that moderate and adequate passageways for racks, pallets, and shelves.

Non-usable items (such as products that have expired, been damaged, or have quality defects) are routinely separated from usable inventory (M=2.75, SD = 0.785) this implies that non-usable items are separated from usable items occasionally.

There is access-controlled storage (such as a separate secured room, cabinet, or lockable wire cage within the storage facility) (M=3.24, SD = 0.969) This impliesthat there is a good mechanism to control secured items.

Pharmaceuticals are always kept in such a way that supports the stock management principle of first-to-expire, first-out (FEFO) (M=3.29, SD = 0.827) this implies that EPSS adheres to FEFO for stock management. The cold room's temperature is checked twice daily, recorded, and if it is outside the permitted range, it is reported for prompt action) (M=2.91, SD = 1.01) this implies that cold room temperature is sometimes checked and recorded. Storage areas are regularly inspected and cleaned (M=2.54, SD = 1.001) this implies that the storage area is occasionally inspected and cleaned. Pharmaceuticals are kept in special storage facilities to avoid contamination, and cross-contamination (M=2.68, SD = 0.918).

According to the results in the preceding table, the aggregate mean and standard deviation of (M = 2.79, SD = 0.409) demonstrated that storage was occasionally practiced in the organization.

4.3.1.4 Pharmaceutical Order Picking Practice

The purpose of the research was to investigate the current pharmaceutical order picking practices in the Ethiopian pharmaceutical supply service. The results of the investigation are shown in the table below.

Table 4.5: Descriptive statics of order picking practice

Order Picking	*N*	*Mean*	*Std.*
Most of the time, products are taken out of storage exactly as specified on the picking slip or issue order (the correct items, in the correct amount, with the correct expiration, with the correct batch number, from the correct manufacturer, in the correct location of storage area).	94	*2.63*	*0.716*
The dispatch area for picked items is organized by category so that the accountable warehouse manager can inspect the picking accuracy.	94	*3.31*	*0.906*
Whenever there are picking mistakes, the checker usually keeps a record of the mistake to determine extra training.	94	*2.94*	*1.2*
The design of the warehouse space (aisle and layout) is easy to pick items free from damage during order picking activity.	94	*3.12*	*0.779*
Grand Total	94	*3.0*	*0.779*

Source: SPSS own survey (2023)

the data shows that Most of the time, products are taken out of storage exactly as specified on the picking slip or issue order (M=2.63, SD = 0.716) from this analysis EPSS has poor picking practice and must strengthen picking accuracy to facilitate picking based on specified issue order.

The dispatch area for picked items is organized by category so that the accountable warehouse manager can inspect the picking accuracy (M=3.31, SD = 0.906) This analysis shows that there is moderate inspection of picking accuracy by the warehouse manager during dispatch.

Whenever there are picking mistakes, the checker usually keeps a record of the mistake to determine extra training (M=2.94, SD = 1.2) this analysis shows that EPSS strengthen picking accuracy and recording related to picking mistake.

The design of the warehouse space (aisle and layout) is easy to pick items free from damage during order picking activity (M=3.12, SD = 0.779) this analysis show that EPSS has a good warehouse layout to pick up orders easy free from damage.

Order picking was occasionally practiced in the organization, as revealed by the above table's aggregate mean and standard deviation of (M = 3, SD = 0.779).

4.3.1.5 Pharmaceutical Dispatch Practice

The results of the research are displayed in the table below to fulfill its goal of examining the practice of pharmaceutical dispatch in the Ethiopian pharmaceutical supply service.

Table 4.6: Descriptive statics of dispatch practice

Dispatch	N	Mean	Standard Deviation
Orders from the hub are loaded onto a pallet or packed into the appropriate-sized boxes to protect them against contamination and damage in transportation.	94	2.55	1.103
The pharmaceuticals are properly packed so that it increases vehicle space utilization, and facilitates ease of loading and receipt at destination.	94	2.91	0.968
The vehicles are loaded carefully and systematically on a first-out/last-in basis to save time when unloading and prevent physical damage	94	2.93	0.852
Grand Total	94	2.8	0.477

Source: SPSS own survey (2023)

Additionally, the data shows that Orders from the hub are loaded onto a pallet or packed into the appropriate-sized boxes to protect them against contamination and damage in transportation (M=2.55, SD = 1.103) This implies that EPSS has a poor hub order process in the appropriate-sized boxes to protect them against contamination while dispatching.

The pharmaceuticals are properly packed so that it increases vehicle space utilization, and facilitates ease of loading and receipt at destination transportation (M=2.91, SD = 0.968) this implies that there is poor vehicle space utilization during Dispatch.

The vehicles are loaded carefully and systematically on a first-out/last-in basis to save time when unloading and prevent physical damage (M=2.93, SD = 0.852) this implies that vehicles are loaded carefully and systematically on a first-out/last-in basis. Dispatch was occasionally practiced in the organization, as revealed by the above table's aggregate mean and standard deviation of (M = 2.8, SD = 0.477).

4.4 Pharmaceutical Warehouse Performance

The study aimed to examine the state of performance of pharmaceutical warehouses in the Ethiopian pharmaceutical supply service, and, accordingly, its findings are presented here in the table below.

Table 4.7: Descriptive statics of Warehouse performance

Item	*N*	*Mean*	*Standard Deviation*
In our warehouse, there are no inventory discrepancies	*94*	*3.28*	*1.122*
Our warehouse put away accurately a material in a correct location	*94*	*3.31*	*0.906*
EPSS warehouse picking accurately materials from the storage based on the requested	*94*	*2.77*	*0.905*
In the EPSS warehouse Hubs order processed timely	*94*	*2.39*	*0.845*
We measure the time of order is received and order is dispatched to the clients timely	*94*	*2.64*	*0.825*

EPSS measures the amount of put-away time from a product is unloaded and ready for picking in the warehouse	*94*	*2.27*	*0.834*
We are successful in lowering the overall cost of holding inventory.	*94*	*3.56*	*1.04*
In the warehouse, we are effective at reducing overall product damage such as product expiration, breakage, leakage, etc.	*94*	*3.31*	*0.906*
We are successful in minimizing all warehousing activity costs	*94*	*3.53*	*0.98*
Our warehouse personnel utilizes warehouse spaces properly	*94*	*3.51*	*0.98*
Our warehouse personnel utilizes warehouse spaces properly	*94*	*2.67*	*0.821*
Grand total	*94*	*2.8*	*0.477*

Source: SPSS own Survey (2023)

Warehouse performance was occasionally practiced in the organization, as revealed by the above table's aggregate mean and standard deviation of (M = 2.8, SD = 0.477) .The abovetable reveals that in our warehouse, there are no inventory discrepancies (M=3.28, SD = 1.122) this implies that EPSS has good inventory accuracy. Our warehouse put away accurately a material in a correct location (M=3.31, SD = 0.9062) this implies that EPSS has good put-away accuracy.

EPSS warehouse picking accurately materials from the storage based on the requested (M=2.93, SD = 0.852) this implies that poor picking accuracy when material are requested.

In the EPSS warehouse Hubs order processed timely (M=2.39, SD = 0.845) this implies that there is poor hubs order processing timely. We measure the time of order is received and order is dispatched to the clients timely (M=2.64, SD = 0.825) this Implies that EPSS has a poor mechanism to measure the time of order is received and order is dispatched to the clients timely.EPSS measures the amount of put-away time from a product is unloaded and ready for picking in the warehouse (M=2.27, SD = 0.834) This implies that EPSS has poor to measures the amount of put-away time from a product is unloaded and ready for picking in the warehouse.

We are successful in lowering the overall cost of holding inventory (M=3.56, SD = 1.04) this implies that EPSS has done well in reducing the overall cost of holding Inventory. In the warehouse, we are effective at reducing overall product damage such as product expiration, breakage, leakage, etc. (M=3.31, SD = 0.906) This implies that EPSS has effective at reducing overall product damage such as product expiration, breakage, and leakage.

We are successful in minimizing all warehousing activity costs, our warehouse personnel utilizes warehouse spaces properly (M=3.53, SD = 0.98) this implies that EPSS has well minimizing all warehousing activity costs. Our warehouse personnel utilizes warehouse spaces properly (M=3.51, SD = 0.98).This implies that EPSS has well in the utilization of warehouse space properly.

4.5 Correlation

A correlation coefficient is a measure of a linear relationship between two variables and is denoted by the letter "r." The correlation coefficient "r" ranges from -1to +1 (-1< r <+1), where -1 indicates a completely negative correlation between the variables, 0 denotes a complete lack of association between the variables of interest, and +1 denotes a complete positive association. A correlation is the metric used to determine the relationship between two variables. The coefficient of correlation ranged from 0.1 to 0.29 for small or weak correlations, 0.3 to 0.49 for medium or strong correlations, > 0.5 for large or strong correlations, and zero for no correlation (Shiau & Lee, 2010).

Table 4.8: Independent and dependent variable of coefficients of correlation

		warehouse performance	Receiving	Put-away	Storage	Order Picking	Dispatch
Warehouse Performance	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	94					
Receiving	Pearson Correlation	.730**	1				
	Sig. (2-tailed)	0					
	N	94	94				
Put -away	Pearson Correlation	.729**	.676**	1			
	Sig. (2-tailed)	0	0				
	N	94	94	94			
Storage	Pearson Correlation	.598**	.367**	.326**	1		
	Sig. (2-tailed)	0	0	0.001			
	N	94	94	94	94		
Order picking	Pearson Correlation	.802**	.720**	.573**	.482**	1	
	Sig. (2-tailed)	0	0	0	0		
	N	94	94	94	94	94	
Dispatch	Pearson Correlation	0.193	-0.158	-0.075	.711**	0.026	1
	Sig. (2-tailed)	0.062	0.127	0.475	0	0.804	
	N	94	94	94	94	94	94

**. Correlation is significant at the 0.01 level (2-tailed).Source: SPSS Own Survey (2

A correlation analysis is a method of explanatory design used to determine an association between the independent variables of warehousing practices and the dependent variables of warehouse performance. The Pearson correlation approach is used to find the correlation and is predicated on the notion that the variables are linearly related. The correlation coefficients are shown in Table 10 above along with the correlation's respective significance.

Receiving and warehousing performance have a positive and significant relationship ($r=0.730$, $N=94$, $p<0.01$), which indicates that the two variables are associated. Put-away and warehousing performance has a positive and significant relationship ($r=0.729$, $N=94$, $p<0.01$), which indicates that the two variables are associated. Storage and warehousing performance have a positive and significant relationship ($r=0.598$, $N=94$, $p<0.01$), which shows that the two variables are associated.

Order picking and warehousing performance have a positive and significant relationship ($r=0.802$, $N=94$, $p<0.01$), which indicates that the two variables are associated. Dispatch and warehousing performance has a positive and significant relationship ($r=0.193$, $N=94$, $p<0.05$), which shows that the two variables are associated.

Generally, the correlation study often showed a positive and statistically significant correlation between the warehousing practices and the warehouse performance of the organization.

4.6 Regression Analysis and Hypothesis Testing

A statistical procedure for analyzing the associative relationships between a dependent variable and one or more independent variables is known as regression analysis. As the study has included five independent variables, it needs to use multiple regression analysis, which is a method for creating a mathematical relationship between two or more independentvariables and a dependent variable at the same time. On the other hand, it measures the effect of warehousing practices (receiving, put-away, storage, order picking, and dispatch) on the warehouse

performance of the Ethiopian Pharmaceuticals Supply Service.

4.6.1 Multiple linear regression assumptions

Multi collinearity Test

Multi-collinearity is defined as a condition in which the inter correlations between independent variables in a multiple regression model are extremely high, resulting in misrepresentations of regressionanalysis results. If the value of r = 1, it means that the predictor variables are exactly multi collinear, resulting in inaccurate inferences regarding the association between the independent and dependent variables (Kim, 2019). The data is free of multi collinearity issues if the tolerance and variance inflation factors are greater than 0.1 and less than 10, respectively (Kim, 2019).

Table 4.9: Multicolinearity test

	Collinearity Statistics	
	Tolerance	VIF
Receiving	0.318	3.144
Put away	0.523	1.913
Storage	0.231	4.323
Order picking	0.411	2.435
Dispatch	0.283	3.536

Source: SPSS own survey (2023)

To identify the multicollinearity issue, before performing the regression analysis, the VIF method is used. As presented in Table 4.9, the values of VIF are well below 10, indicating that multicollinearity among the study's independent variables is not an issue

Normality Test

The mean of the residuals reaching zero is the rationale for the normality assumption. Additionally, normality tests determine whether a given data has been described by

a normal distribution or determine the chance that an underlying random variable will be normally distributed (Gujarati and Porter, 2009). As a result, the researcher used histogram methods to check the data's normality.

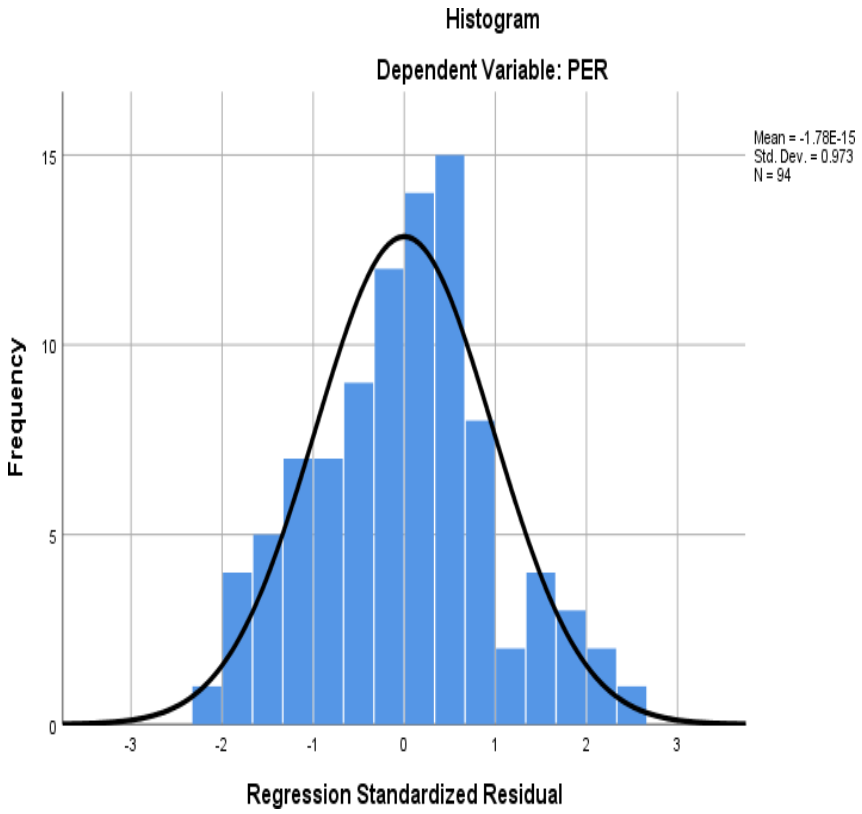

Figure 4.2: Normal distribution Histogram results

Source: SPSS own survey (2023)

Linearity test

When there is a linear relationship between the dependent and independent variables, multiple regressions can accurately predict that relationship (Shiau & Lee, 2010). The pp plot residual, as illustrated in Figure 4.3 below, is the greatest tool for verifying this. The association between the dependent and independent variables is linear when p-p residuals plot a straight line. As a result, the data used for this study do not have a linearity problem.

Figure 4.3: Normal P-P plot; linearity test result

Source: SPSS own survey (2023)

Heteroscedasticity Test

Homoscedasticity is defined as the homogeneity of variance assumptions or a constant finite variance that occurs across all levels of the predictor variables (independent variables), according to a visual examinationof a scatter plot of standardized residuals or errors by regression of the standardized predicted value can be used to verify the assumption (Williams et al., 2013).

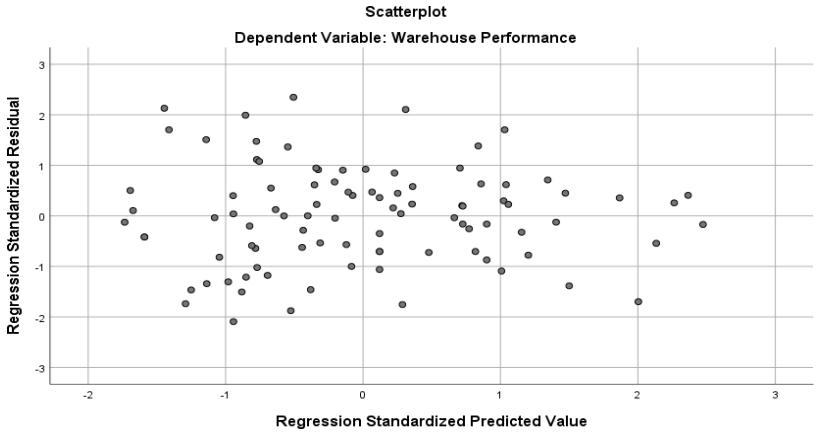

Figure 4.4: Hetrostedasticity result

Source: SPSS own survey (2023)

In Figure 4.4 above, the residuals at each level of explanatory variables appear to be evenly distributed. It may be concluded that this study has no Heteroscedasticity problems.

4.6.2 Regression Analysis

Regression analysis is a way of predicting an outcome variable from one predictor variable (simpleregression) or several predictor variables (multiple regressions).

Table 4.10: Coefficient of determination

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.902[a]	0.814	0.804	2.81493

a. Predictors: (Constant), dispatch, order picking, put-away, receiving, store

b. Dependent Variable: Warehouse Performance

Source: SPSS own Survey (2023)

As can be seen from the model summary above, the letter "R" stands for the multiple correlation coefficient value of 0.902, which indicates a very strong correlation between the independent and dependent variables and allows a high level of prediction. The effects of warehousing practices on the warehouse performance of the Ethiopian Pharmaceutical Supply Service are investigated using the coefficient of determination (R square value) analysis. Compared to R squared, which can only

go up, adjusted R squared can go down with the addition of fewer relevant factors, making it a more reliable and precise measurement than R2. The model can explain 80.4% of the variance in the warehouse performance of pharmaceuticals, according to the adjusted R-square (0.804), which was obtained by combining all predictor (Warehouse management) variables linearly. The remaining factors, which were not taken into account in this study, are responsible for 19.6% of the change or influence on the warehouse performance of the organization, necessitating further research.

In general, the five variables of warehousing practices, namely: receiving, put-away, storage, order picking, and dispatch, are good explanatory variables in predicting the organization's warehouse performance.

Analysis of Variance (ANOVA)

The F ratio enables us to check whether the entire model is suitable for the research paper. As seen in the table, the level of significance is less than 0.05 (0.01), thus explaining the existence of a statistically significant relationship between independent variables and dependent variables. Warehousing practices have significantly predicted the Warehouse performance of the organization by F = 77.143 times, at a sig. value ofless than 0.01. As a result, the entire model is important and a good fit for the research.

Table 4.11: Anova Result

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3056.4	5	611.272	77.143	.000[b]
	Residual	697.3	88	7.924		
	Total	3753.7	93			

Dependent variable: warehouse performance

Predictors: (Constant), dispatch, Order picking, put-away, receiving, storage

Source: SPSS own survey (2023)

4.6.3 Regression coefficient

The regression coefficient indicated in the table shows how warehouse practices affect the warehouse performance of the Ethiopian pharmaceutical supply service. The unit of measurement for the regression coefficient is known as the standard deviation.

Table 4.12: Regression Coefficient

		Unstandardized Coefficients		Standardized Coefficients		
					t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	-10.227	2.847		-3.592	0.001
	Receiving	0.236	0.101	0.19	2.328	0.022
	Put- away	0.762	0.141	0.344	5.409	0
	Storage	0.177	0.191	0.089	0.928	0.356
	Order picking	0.945	0.161	0.422	5.88	0
	dispatch	0.777	0.383	0.175	2.027	0.046
a. Dependent Variable: Warehouse Performance						

Source: SPSS own survey (2023)

Standardized Coefficient (Beta)

The most important predictor factors can be identified using standardized coefficients. Because of this, it evaluates the effect of several independent variables (warehousing practices) on the dependent variable (warehouse performance). The highest standardized coefficient is for order picking (Beta = 0.422), and it is Followed by put away (Beta = 0.344), receiving (Beta = 0.190), dispatch (Beta = 0.175), and storage (Beta =0.089). Out of the five predictor factors, the order-picking practice had the highest relative impact on pharmaceutical warehouse performance.

The P value for two of the independent variables is less than 0.01; as a result, the order picking and put awayprocesses of the organization are statistically significant predictors of the organization's warehouse performance. In addition, The P value for two of the independent variables is less than 0.05; as a result, the Receiving and dispatch practice of the organization are statistically significant predictors of the organization'swarehouse performance.

The effect of individual dimensions of warehousing practices is presented in the Table above. The coefficient of receiving is positive and significant at 0.01. The positive coefficient suggests that improving warehouse management's receiving increases the organization's warehouse performance, while other variables remain constant. This implies that receiving warehouses has a significant positive effect on the warehouse performance of the organization. Receiving serves as the foundation for all subsequent warehouse operations. Receiving,which is the group of tasks involved in receiving all incoming items in an organized manner, checking that the quantity and quality are as requested, and distributing materials to storage facilities or other organizations (Frazelle, 2002).

The coefficient of put away is positive and significant at 0.01. The positive sign of the coefficients suggests that when put away, increases warehouse performance of the organization increases, and vice versa when other variables remain constant. This implies that put-away is positively affecting the warehouse performance of the organization. The information will be used to create well-organized pick lists that will aid order pickers in saving the goods for clients. Because the goods may need to be transported a long distance to their storage site, putting them away might be time-consuming (Bartholdi and Hackman, 2011).

The coefficient of storage is positive and insignificant at the p-value of 0.05. The positive sign of the coefficient recommends that when storage increases, the organization's warehouse performance remains constant. Storage does not affect warehouse performance.

The coefficient of order picking is positive and significant at 0.01. The positive coefficient recommends that increasing warehouse management's order picking increases the organization's warehouse performance, while other variables remain constant. Order picking isa primary goal of most warehouses: to accurately, promptly, and in good condition select from inventory the specific commodities needed by customers and combine them into a single shipment. This task is crucial since it has a direct impact on customer service and is also quite expensive (Faber, 2015).

The coefficient of dispatch is positive and significant at 0.05. The positive coefficient recommends that improving warehouse management's dispatch increases the organization's warehouse performance, while other variables remain constant. This implies that dispatch has a significant positive effect on the warehouse performance of the organization. After order picking, the products for a specific order must be assembled and prepared for shipping. This could entail value-added tasks including labeling, assembling, testing, and packaging into boxes. These actions may be fairly significant where production postponement is implemented (Rushton et al., 2022).

UN Standardized Coefficient

The unstandardized coefficients help to determine or interpret the influence of each predictor variable onthe Warehouse performance of the Pharmaceutical.

The unstandardized coefficients (ß1, ß2, ß3, ß4, ß5) are coefficients of the examined regression model, sothe general regression. The model for warehouse performance was equated as follows:

$Y = ß0 + ß1X1 + ß2X2 + ß3X3 + ß4X4 + ß5X5 + e$

Where;

Y = Warehouse Performance

$ß_0$ = Constant factor = -10.227, e = Error

X_1 = Receiving, $ß_1$ = Receiving Coefficient = 0.236

X_2 = Put away, ß2 = Put away Coefficient = 0.762

X_3 = Storage, $ß_3$ = Storage Coefficient = 0.177

X_4 = Order picking $ß_4$ = Order picking Coefficient = 0.945

X_5 = dispatch, $ß_5$ = dispatch Coefficient = 0.777Therefore,

the equation is written as;

$Y = -10.227 + 0.236X_1 + 0.762X_2 + 0.177X_3 + 0.945\ X_4 + 0.777X_5 + e$

The constant factor (ß0 = -10.227) demonstrates that the warehouse performance of the Ethiopian Pharmaceutical Supply Service would be -10.227 assuming the model's other variables stayed at zero. The analysis indicates the organization's warehouse performance will increase by 23.6% as a result of the unit increase in Receiving. Additionally, a unit increase in storage, a unit increase in order picking, and a unit Increase in put-away all result in increases in warehouse performance of 76.2 percent, 17.7 percent, and 94.5percent, respectively. Finally, a unit increase in dispatch can improve warehouse performance by 77.7%.

Table 4.13 Summary of Hypothesis

Hypothesis	Beta	Sig.	Decision
H1: Receiving has a positive and significant effect on warehouse performance	.190	.022	Accepted
H2: Put- away has a positive and significant effect on warehouse performance	.344	.000	Accepted
H3: Storage has a positive and significant effect on warehouse performance	.089	.356	Rejected
H4: Order picking has a positive and significant effect on warehouse performance	.422	.000	Accepted
H5: Dispatch has a positive and significant effect on warehouse performance	.175	.046	Accepted

4.7 Discussions of the Result

The findings of the descriptive statistics demonstrated that order picking was occasionally practiced, with a mean value of (M = 3.0, SD = 0.779), and that it was followed by storage (M = 2.9, SD = 0.409), receiving (M = 2.08, SD = 0.51), dispatch (M = 2.8, SD = 0.477), and put away (M = 2.75, SD = 0.409). In general, a near-low-end moderate extent mean value was used for all warehousing practices.

According to the results of the correlation analysis, Order picking practice has a very strong positive and statistically significant relationship with Warehouse performance ($r = 0.802$, $P<0.01$), followed by Receivingpractice ($r = 0.730$, $P<0.01$), and put-away practice ($r = 0.729$, $P<0.01$). Storage practice, on the other hand, has a statistically significant and strong positive relationship with the organization's warehouse performance, with a correlation value of $r = 0.598$ at the $P<0.01$ significance level, except dispatch practice ($r = 0.193$, $P> 0.05$) and a weak positive relationship with warehouse performance.

Therefore, except for dispatch practice,which has a $p > 0.05$, warehousing practices have a strong positive and statistically significant correlation with the performance of the pharmaceutical warehouse at the Ethiopian Pharmaceutical Supply Service. According to the regression coefficient results, order picking has the highest positive and statistically significant impact on warehouse performance, with an unstandardized ß coefficient of 0.945, followed by put-away with corresponding unstandardized ß coefficient values of 0.762. Receiving with an unstandardized ß coefficient of 0.236 at a significance level of $P< 0.05$ implies a statistically significant impact on warehouse performance, followed by dispatch with corresponding unstandardized ß coefficient values of 0.777, resulting in the conclusion that warehousing practice has a direct impact on the warehouse performance of pharmaceuticals at the Ethiopian Pharmaceutical Supply Service

CHAPTER FIVE

SUMMARY OF KEY FINDINGS CONCLUSION, AND RECOMMENDATION

The study's main goal was to examine the Effect between warehousing practices and pharmaceutical organization warehouse performance. It was also mentioned as evaluating the organization's warehousing practices. This section, therefore, proposed an overview of the key outcomes, conclusions made from the study's data, suggestions for improving the Ethiopian Pharmaceutical Supply Service's pharmaceutical warehouse practices, and potential areas for further study.

5.1 Summary of Findings

This research put a significant effort to examine the effect of warehousing practices on the organization's warehouse performance. The study also intended to evaluate the state of present warehousingpractices, including receiving, put-away, storage, Order picking, and dispatching. A review of the literature is included in this study that covered concepts of warehouse practices and performance as well asempirical investigations that showed actual practices concerning the study's goals.

To obtain information needed for this study's analysis, a structured survey was distributed to a predetermined sample of 100 respondents in the Ethiopian Pharmaceutical Supply Service. Ninety-four (94), or 94%, of the hundreds of distributed questionnaires were returned. With a Cronbach's alpha score overall of 0.867, the research questionnaires' internal consistency was determined to be at a good and reliable level

A descriptive statistical analysis was used to calculate the organization's warehousing practices' overall mean. The results showed that order picking was occasionally practiced (mean value = 3.0, SD = 0.779), followed by storage (mean value = 2.79, SD = 0.409), receiving (mean value = 2.8, SD = 0.51), dispatch (mean value = 2.8, SD = 0.477), and finally being put- away (mean value = 2.75, SD = 0.409).

The coefficients of Pearson's correlation were generated to investigate the associations between the organization's warehouse performance and its warehousing practices. Therefore, the correlation result for order picking practice demonstrates a very high positive and statistically significant correlation with warehouse performance ($r = 0.802$, $P< 0.01$), Receiving practice followed in the second ($r = 0.730$, $P< 0.01$), and put-away practice followed in the third ($r = 0.729$, $P< 0.01$).Furthermore, storage practice has a statistically significant and strong positive relationship with the organization's warehouse performance, with a correlation value of ($r =0.598$, $P< 0.01$), followed by dispatchpractice ($r = 0.193$, $P > 0.05$), which demonstrates a weak positive relationship between dispatch and warehouse performance.

The performance of the Ethiopian Pharmaceutical Supply Service's warehouse is examined using the coefficient of determination to determine the impact of warehousing practices. The value of modified R2 in the model summary shows that warehouse performance changes were predicted for 80.4% of the variance. While the remaining variables that aren't taken into account by this model account for 19.6% of thevariations in warehouse performance, necessitating more research.

According to the study, an increase in units for receiving, put away, order picking and dispatch will increase the organization's warehouse performance by 23.6%, 76.2%, 94.5%, and 77.7%, respectively, at a sig. value less than 0.05. The four independent variables are therefore implied to be statistically significantly influencing warehouse performance by these unstandardized regression coefficients. The total model is significant and a strong match for the study because, in addition, warehousing practices significantly predicted the organization's warehouse performance by F = 77.143 times, at a sig. value of less than 0.01 &0.05.

5.2 Conclusions

According to the findings from the study, the conclusions regarding Warehousing practices have drawn the following conclusions:

- All warehousing practices (Receiving, put-away, storage, order picking, and dispatch) were occasionally practiced with a near-low end moderate extent mean value.
- Two of the variables of warehousing practices, namely Order picking and put-away, have very strong and significant relationships with warehouse performance, whereas receiving and storage have a strong and significant relationship, while dispatch has a weak relationship and is insignificant with the warehouse performance (dependent variable) of the organization.
- The study revealed that Warehousing practices (Receiving, put-away, order picking, and dispatch) have high predictive power on the changes in the Ethiopian Pharmaceutical Supply Service's warehouse performance of Therefore, warehousing practices have a positive and statistically significant effect on the warehouse performance of the organization.
- In general, we can say that the study has provided evidence for the direct effect of warehousing practices on the warehouse performance of pharmaceuticals, as supported by the literature.

5.3 Recommendation

According to this study's findings, the researcher gave the following recommendation that helps theEthiopian Pharmaceutical supply service to improve their warehouse performance:

- Enhancing receiving practice by pre-notifying incoming goods is crucial as a cross-checking document with goods, checking all products being received for possible damage caused during shipping. The organization ought to provide consideration to receiving cold chain goods and ensure that products are transported appropriately with the cold van, not integrated with normal products, which need special care to reach the community safely and timely. To enhance its sufficient space for loading and unloading materials, the agency should better construct a Mega warehouse.
- Enhance Put-away practice includes capacity building for warehouse personnel to work put away effectively, segregation of products by lot number, expiry dates previously moved from the receiving area to the storage area, checking put away accuracy for received items placed in a specific location, and monitoring and following up on key performance indicators for put away.
- Enhance storage practice by carrying out regular inspection and cleaning of the storage area, maximizing and optimizing all available space (To efficiently utilize space for storage, expired, impaired, and quality problem products are routinely distinguished from appropriate stock, and storage should be handled effectively to prevent contamination, mix-ups, and cross-contamination).
- Enhance order picking practice by monitoring key performance indicators for picking accuracy, inventory accuracy, and effectively organizing the warehouse.
- Enhance dispatch practice by monitoring key performance indicators for picking accuracy, and inventory accuracy. Within the vehicle, the goods must be organized and safeguarded and strictly adhere toa schedule to deliver hubs orders effectively.

5.4 Suggestions for further study

Receiving, put-away, storage, order selection, and dispatching were the five independent variables examined in this study. All of them, except storage, have significant effects on the organization's warehouse performance given its constraints. Further investigation must be conducted to look at the additional factors that weren't considered in this study but may have an impact on warehouse performance. Additionally, the goal of future research is to examine methods for mitigating and improving the problems associated with the Ethiopian Pharmaceutical Supply Service's warehousing practices.

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Addis Ababa University College of Business & Economics

MA IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Dear Sir/Madam

My name is Biruk Tadesse. To partially meet the requirements for a master's degree in logistics and supply chain management at Addis Ababa University, College of Business and Economics, School of Commerce, I am conducting research on warehousing practices at EPSS. I want to express my sincere gratitude to your company and you for your openness and enthusiasm in taking part in this important study. This survey aimsto investigate the impact of current Warehousing practices on the logistical performance of pharmaceuticals.There is no risk to you in providing this information other than the time you will spend on the questions andanswers, I can assure you. Your response will also be treated with the utmost confidentiality. It will take you

Between 15 and 20 minutes to complete this survey.Note:

- If you need further explanation please do not hesitate to contact me at +251-922454379 orbiruktad1986@gmail.com

ANNEX I Research Instrument/ Questionnaire

Part I: General Information and Demographic Background of Respondents

Please mark ✓ for your appropriate choice.

1. Gender Male ☐ Female ☐
2. Age

Less than 30 years ☐

31-40 years ☐

41-50 years ☐

Above 51 years ☐

3. Educational Qualification

Diploma ☐

Degree ☐

Masters ☐

PhD ☐

4. How long have you been employed by the company?

Below 3 years ☐

3-6 years ☐

7-10 years ☐

Above 10 years ☐

5. In which directorate are you working currently?

Warehouse and Inventory ☐

Distribution And fleet Management ☐

6. What is your job position?

Director ☐

Advisor ☐

Team leader ☐

Officer ☐

Warehouse Manager ☐

PART II: Main Questionnaire

Please indicate your choice by putting the check mark (√) on the appropriate cell.

Where; 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

Please indicate the degree to which you agree with the following statements regarding warehouse management in your organization. (Please take your key warehouse activities in mind while rating thestatements.)

No.	Variables	Score				
	Receiving Activity	1	2	3	4	5
6.1	To receive pharmaceuticals properly, EPSS has standard operating procedures (SOP) in place.					
6.2	There is a pre-notification of the incoming goods that will be received in the warehouses					
6.3	In EPSS Warehouses, there is a distinct separate reception area.					
6.4	When receiving products, there are processes for comparing the documentation with the products.					
6.5	There are procedures for reporting discrepancies to vendors to return and obtain goods again.					
6.6	Each member of the receiving staff has received comprehensive training in the receiving processes.					
6.7	Incoming products are checked (preliminary physical inspection by using a checklist for quantity, quality, any damage, type, and expirydate)					
6.8	During receiving cold chain items, the condition of cold Boxes/refrigerated truck that contains the products is well-checkedto ensure the cold chain is maintained.					
6.9	The EPSS has sufficient equipment to unload materials.					
6.10	The EPSS has sufficient space for loading/unloading materials.					

Put away activity		1	2	3	4	5
6.11	The inspected items can be kept in sufficient storage spaces, such as pallets, cabinets, and shelves.					
6.12	Most warehouse personnel possess the necessary skills to carry out put-away tasks appropriately.					
6.13	For all items received in EPSS warehouses, there is a well-established, organized put-away process.					
6.14	To make order picking easier, every item that is received is put in its preferred position, according to good storage practices.					
6.15	Items are arranged by category, type, batch number, and expiry date before moving from receiving area tothe storage area.					
6.16	Product-specific locations are registered/recorded in EPSA warehouses after being put away.					
6.17	The transfer of cold room items from receiving area to the cold room is Always done within less than 30 minutes from the time of arrival.					

Storage Activity		1	2	3	4	5
6.18	To make put-away and order-picking actions easier, shelves, racks, and pallets are placed in lines with adequate passageways.					
6.19	To effectively utilize storage space, non-usable items (such as products that have expired, been damaged, or have quality defects) are routinely separated from usable inventory.					
6.20	The warehouses have enough racks, shelves, and pallets to hold the goods.					
6.21	For products that require further protection, there is access-controlled storage (such as a separate secured room, cabinet, or lockable wire cage within the storage facility).					
6.22	Pharmaceuticals are always kept in such a way that supports the stock management principle of first-to-expire, first-out (FEFO).					
6.23	The cold room's temperature is checked twice daily, recorded, and if it is outside the permitted range, it is reported for prompt action.					
6.24	Storage areas are regularly inspected and cleaned.					
6.25	Pharmaceuticals are kept in special storage facilities to avoid contamination and cross-contamination.					

	Order Picking Activity	1	2	3	4	5
6.26	Most of the time, products are taken out of storage exactly as specified on the picking slip or issue order (the correct items, in the correct amount, with the correct expiration, with the correct batch number, from the correct manufacturer, in the correct location of storage area).					
6.27	The dispatch area for picked items is organized by category so that the accountable warehouse manager can inspect the picking accuracy.					
6.28	Whenever there are picking mistakes, the checker usually keeps a record of mistake to determine extra training.					
6.29	The design of the warehouse space (aisle and lay out) is easy to pickitems free from damage during order picking activity.					

	Dispatch Activity	1	2	3	4	5
6.30	Orders from the hub are loaded onto a pallet or packed into the appropriate-sized boxes to protect them against contamination and damage in transportation.					
6.31	The pharmaceuticals are properly packed so that itincreases vehicle space utilization, and facilitates ease of loading and receipt at destination.					
6.32	The vehicles are loaded carefully and systematicallyon a first-out/last-in basis to save time when unloading and prevent physical damage					

Warehouse Performance

	Quality	1	2	3	4	5
1	In our warehouse, there are no inventory discrepancies					
2	Our warehouse put away accurately a material in a correct location					
3	EPSS warehouse picking accurately materials from the storage based on the requested					
	Responsiveness	1	2	3	4	5
1	In the EPSS warehouse Hubs order processed timely					
2	We measure the time of order is received and order is dispatched to the clients timely					
3	EPSS measures the amount of put away time from a product is unloaded and ready for picking in the warehouse					

	Cost/Financial	1	2	3	4	5
1	We are successful in minimizing the total inventory holding cost					
2	We are successful in minimizing total product damage in thewarehouse like product Expiry, breakage, leakage, etc.					
3	We are successful in minimizing all warehousing activity costs					

	Productivity	1	2	3	4	5
	Our warehouse personnel utilizes warehouse spaces properly					
	We are working to improve storage capacity by removingunnecessary materials					