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THE EFFECT OF INTERNAL ORGANIZATIONAL INTEGRATION ON PHARMACEUTICAL SUPPLY CHAIN PERFORMANCE: IN THE CASE OF BLACK LION HOSPITAL

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Declaration

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and that l have not previously in its entirety or in part submitted at any university for a degree.

Name of candidate _____ **Signature:** _____ **Date:** _____

THESIS APPROVAL

As members of the board of examiners, we examined this entitled "**the effect of internal integration on pharmaceutical supply chain performance at black lion hospital**''. By Abeba Gezahegn we hereby certify that the thesis is accepted for fulfilling the retirements for the awarded of the degree of Master of Art in Logistic and supply chain management.

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LIST OF ABBREVIATIONS AND ACRONYMS

Acronym	Meaning
CRS:	Coordination and Resource Sharing
EPSS:	Ethiopian Pharmaceuticals Supply Service
IPLS:	Integrated pharmaceuticals logistics system
II:	Information Integration
RDF	Revolving Drug Fund
RRF:	Report and Requisition Form
SPSS:	Statistical package for Social Science
SCP:	Supply Chain Performance
SCM:	Supply chain management
PSCP:	Pharmaceuticals Supply Chain Performance
ORL:	Organizational Relationship Linkage
OP:	Operating Procedures
WHO:	World Health Organization

Abstract

The researcher has been examined the effect of internal organizational integration on pharmaceutical supply chain performance at black lion Hospital. The study focused on three key variables of internal integration: informational integration, resource sharing and organizational relationship linkage. The study used quantitative research approach using descriptive and explanatory research design. The target population consisted is 91 pharmacy professional. The population sixe was small and manageable a census sampling technique was used. The study was used primary data collected using structured questionnaires designed on a five-point Likert scale. The data were analyzed using SPSS version 27 through descriptive statistics, correlation analysis and multiple regression analysis. The summary findings show that internal integration practices exist within the hospital, particularly in terms of information sharing, departmental coordination and organizational linkage. Most of respondents agreed that informational systems and communication tools are in place and that departments often share operational data resource. The hospital performs well in areas such as emergency response, cost reduction, and service delivery. The correlation analysis shows that positive relationship between all three internal integration dimension and supply chain performance. Therefore, regression results showed that only organizational relationship linkage had a statistically significant effect on pharmaceutical supply chain performance. Information integration and resource sharing showed positive but statistically insignificant effects. The model explained 51% of the variation in supply chain performance. The study concluded that organizational relationship linkage is the most important determinant of pharmaceutical supply chain performance at Black Lion specialized Hospital. Strong collaboration, communication and coordination among departments supported significantly to increase pharmaceutical supply chain performance. Thus, the hospital should strengthen interdepartmental relationship, improve information sharing mechanisms, increase resource sharing practices and invest in integrated information systems to further increase pharmaceutics supply chain performance.

***Keywords**: informational integration, organizational relationship linkage, resource sharing, internal organization integration, pharmaceutical supply chain performance and Black lion Hospital.*

CHAPTER ONE

I INTRODUCTIONS

1.1 Background of the Study

Internal organization integration refers to the degree to which different departments and functional units within an organization communicate, collaborate and coordinate their activities to achieved common organizational objectives. It refers the alignment of organizational processes, information systems, resources and decision making activates across different departments. According to Flynn, Huo, and Zhao (2010), internal organization is the degree to which a firm structures its organizational strategies, practices and processes into synchronized and collaborative activities to satisfy customer requirements and increase organizational performance. According to Basnet (2013) argued that internal integration serves as the foundation for achieving effective supply chain management because it improve coordination among internal functions before establishing external relationship with suppliers and customers.

Supply chain performance is to the ability of an organization to efficiently manage the flow of products, services, information and financial resources from suppliers to end users while meeting customer requirements at minimum cost. An effective pharmaceutical supply chain involves that the right medicines were available in the right quantities, at the right place and at the right time. According to Mntzer et al. (2021), Supply chain performance refers to be measured through indicators such as delivery reliability, adaptability, cost efficiently, quality and customer satisfaction.

Globally, healthcare hospital continue to face numerous pharmaceutical supply chain challenges, including stock outs, overstocking, weak inventory management, inadequate information sharing and inefficient coordination at supply chain sectors. This challenges to affect healthcare service delivery and patient outcomes. According to Flynn et al (2010) implies that organizations with strong internal integration achieve better supply chain responsiveness and operational efficiency than organizations with poor internal coordination mechanisms.

In Ethiopia, the pharmaceutical supply chain is primarily managed through the Ethiopian pharmaceutical supply service (EPSS), its knows pharmaceutical Fud and Supply Agency. To increase medicine availability and logistics management, the government introduced the integrated pharmaceutical logistics systems (IPLS), which facilitates inventory control, reporting, procurement and distribution pf pharmaceutical different public health facilities. The IPLS were build to strengthen the efficiency of supply management and increase continuous availability of essential medicines through the country. Moreover, despite this effort, different studies had reported persistent challenge such as stock outs of essential medicines, late deliveries, inadequate inventory control systems, poor information sharing, and poor coordination among supply chain sectors, which continue to affect pharmaceutical supply chain performance in Ethiopia public health facilities (Deliver Project, 2011, Yaeta & Nebiyu, 2019, Berhanu et al, 2019).

As the largest referral and university hospital in Ethiopia, Tikur Anbessa serves many patients from various parts of the country. In addition to providing medical care, it also supports numerous complex supply chain activities related to pharmacy operations, which involve procurement, warehouse management, inventory control and distribution of pharmaceuticals. Thus, the effectiveness with which the functions of procurement, warehousing, inventory control and pharmacy operations are integrated, coordinated and executed by Tikur Anbessa is vital to ensure medicines are always available, that valuable resources are used efficiently and to deliver high-quality healthcare services. However, many healthcare organizations in developing nations encounter numerous issues related to information flow as well as barriers to effective communication (Ageron, Gunasekaran & Spalanzani, 2012; Flynn, Huo & Zhao, 2010; World Health Organization, 2021).

Thus, this study was to examine the effect of internal organizational integration on pharmaceutical supply chain performance at Black Lion specialized hospital, moreover, the study was focused on the effect of informational integration, coordination and resource sharing and organizational relationship linkage on pharmaceutical supply chain performance. The result of the study were expected to contributed to the existing body of knowledge an provide practical recommendations for increasing pharmaceutical supply chain management with public healthcare institution in Ethiopia.

1.2. Statement of the Problem

Supply chain integration is a coordinated approach among the members of a supply chain to provide beneficial value to customers and reduce redundancy in operational procedures. Integration of a supply chain allows for more effective flow of goods, information and money from point of origin to point of consumption. Integration also improves internal and external relationships between departments in the company as well as its vendors and customers, which together lead to improved performance of the overall organization (Luque, Lopez and Kumardey,2012).

For the pharmaceutical industry, an efficient supply chain is critical to ensuring access to medicines and healthcare products at all times. In many low-income countries, however, healthcare providers continue to experience challenges with their operations such as lack of medicines, excess inventory, slow procurement times, and disposal of expired products. These issues all lead to decreased quality of service and ultimately lower quality of care for their patients (Yadev, 2015).

Both internal integrations are an important factor in the success of supply chains. When departments (e.g., procurement and pharmacy, inventory and distribution) of a supply chain cannot come together, the organization becomes inefficient (Fluynn egtal, 2010). Poor communication and poor information sharing result in duplicate tasks, delayed decisions and limited visibility to inventory status. According to prajogo & Olhager (2012) Conversely, when there is improved internal integration, organizations tend to deliver better services, have lower operational costs, and be more responsive to the supply chain.

Pharmaceutical supply chain is characterized by several stricture and operational challenges. Public health facilities often suffer from weak internal coordination, fragmented information systems and inadequate use of integrated technologies. This limitation contributes to frequent medicine stock outs, inefficient inventory management and weak service delivery (Gebremedhin et al, 2017). Supply chain management have largely focused on external integration such as a relationship with suppliers and distributors or in general supply chain practices, with comparatively limited attention given to internal integration within healthcare institutions (Flynn, Huo, Zhao, 2010). The developing countries like Ethiopia, there is a scarcity of b research that

examines how internal integration among hospital influences pharmaceutical supply chain performance (Gebremedhin et al, 2017).

In T.A. Hospital there has been a considerable amount of pressure created within the pharmaceutical supply chain due to an increase in volume of drugs and supplies. Preliminarily observations that the hospital several challenges related to pharmaceutical supply chain. This include weak coordination between procurement and pharmacy units, limited information sharing across departments, late in procurement processes and inconsistencies in inventory management practices. Such as result in stock outs of essential medicines, overstocking of some times and inefficiencies in service delivery (Preliminarily observations, 2026). Therefore, this study differently from previous research b specifically investigating the effect of internal integration on pharmaceuticals supply chain performance at Tikur Anbessa specialized Hospital. By focusing on internal processes such as interdepartmental coordination, information sharing and system integration. Therefore, this study focuses on examining how internal integration practices influence pharmaceutical supply chain performance at Black Lion Hospital.

1.3 Research Questions

Based on the objectives of the study, the following research questions are formulated:

1. What is the effect of information integration on supply chain performance at Black Lion Hospital?
2. What is the effect of coordination and resource sharing on supply chain performance at Black Lion Hospital?
3. What is the effect of organizational relationship linkage on supply chain performance at Black Lion Hospital?

1.4 Objectives of the study

1.4.1 General Objectives

The general objective of this researcher is to examine the internal integration on pharmaceutical supply chain performance in case of Black Lion Hospital.

1.4.2 Specific objective

1. To examine the effect of information integration on supply chain performance at Black Lion Hospital
2. To assess the effect of coordination and resource sharing on supply chain performance at Black Lion Hospital
3. To examine the effect of Organizational relationship linkage on supply chain performance at Black Lion Hospital

1.5 Significance of the study

The study examines were the effect of internal integration on supply chain performance, with particular at Black Lion Hospital. Its significance can be viewed from multiple practical and academic perspectives.

First, the study is important for Black Lion Hospital itself. To be assessing key dimensions of internal integration such as interdepartmental coordination, informational sharing and system integration the findings helped hospital management identify to the Mine causes of inefficiencies in pharmaceutical supply chain. This research were support better managerial decision in areas such as process alignment, communication improvement and resource utilized ultimately improve the availability of essential medicines and enhancing the quality of patient care.

This study is relevant to other public hospitality in Ethiopia. As Black Lion Hospital a leading referral and teaching institution, the challenges identified are likely to reflect broader systematic issues within the public healthcare sector. Therefore, the result and suggestion of this researcher can be used by other hospitals to strengthen internal integration practices, enhance coordination among departments, and improve overall pharmaceutical supply chain performance.

The study is beneficial for healthcare professionals, particular pharmacists, supply chain officers and logistics personnel working in hospital. By identifying practical challenges related to internal coordination and information flow, the research can support capacity building initiatives, encourage teamwork across departments and enhance operational efficiency in pharmaceutical supply management.

The study supported to the academic body knowledge in fields of SCM, healthcare logistics and hospital management. Specifically, it adds empirical evidence on the role of internal integration in enhancing pharmaceutical SCP in developing country context.

Finally, the study benefits by improving practical research skills, analytical capabilities and in depth understanding of pharmaceutical supply chain systems. It also fulfills part of the academic requirements for the MA in Logistics and supply chain management.

1.6 Scope of the study

This researcher focused on examined the effect of internal integration on pharmaceutical supply chain performance, with particular emphasis on Black Lion Hospital. The hospital was selected as the researcher area because it is the largest referral and teaching hospital in Ethiopia, where complex pharmaceutical supply chain activities are carried out.

The study was used both an explanatory and descriptive research design with a quantitative research approach. The explanatory design is appropriate because the study aims to evaluate the cause effect relationship between internal integration factors and pharmaceutical SCP.

The study was used primary data collected through structured questionnaires administered to pharmacy professionals, store managers, supply chain activates within the hospital. The questionnaires were included Likert Scale items designed to measure internal integration practices and supply chain performance.

This study focused on the following independent variables: informational integration, coordination and resource sharing and organizational relationship linkage. Dependent variables of this study is pharmaceutical supply chain performance, which is measured in terms of medicine availability, responsiveness to demand, cost efficiency and accuracy of inventory management , reduction of stock outs and overall service delivery effectiveness.

1.7 Operational Definition

Supply chain performance is a supply chain effectively and efficiently achieves its objectives in terms of cost reduction, responsiveness, reliability and service quality (Chopra a& Meidl, 2019).

Informational integration refers to the extent to which departments within a hospital share accurate, timely and reliable information regarding pharmaceutical procurement, inventory levels, distribution and consumption (Zhang etal, 2011).

Coordination and resource sharing: it involves the level of collaboration among key departments such as pharmacy, procurement, store management and clinical units and executing pharmaceutical supply chain activity (Prajogo & Olhager, 2012).

Organizational Relationship Linkage is the degree of formal and informal relationship, communication channels and structural connections among departments within a hospital that facilitate smooth supply chain operations (Vander & Van donk, 2008).

1.8 Organization of the Study

This thesis consists of five chapters which detail the various aspects of the research process. The first chapter consists of the introduction to the study. This provide the reader with background to the study, problem formulation, research aims and objectives, research questions, significance of the research, scope of the research, and structure of the thesis. The introduction was given a comprehensive view of the whole research process, it outline the reasons for the research and what it aims to achieve. This chapter was followed by chapter two which is a literature review. The literature review was contain a review of theory relating to both internal integration and supply chain performance and review previous studies focused on the subject matter of this study, identify gaps in the existing literature and provide the conceptual framework that guide this research study. Chapter three details the research methodology of the research study and include the research design, study location description, population of the study, sampling techniques, sources of data, data collection methods, measurement of variables, and analysis methods for the data collected during the research. Additionally, this chapter was cover issues of

validity, reliability and ethical considerations associated with the conduct of the research. Chapter four details the findings and the respective discussions of the research; this was include analysis of the data, interpretation of findings, demographic information pertaining to respondents, descriptive statistics detailing the responses obtained from the respondents, correlation analysis and regression analysis. Finally, chapter five provides a summary of the findings, conclusions, and recommendations based upon the findings of this research study.

CHAPTER TWO

REVIEW OF THE RELATED LITERATURE

This chapter presents a review of relevant literature related to the study. It focuses on theoretical foundations, empirical studies, and the conceptual framework that guide the research. The purpose of this chapter is to examine existing knowledge on internal integration and its effect on pharmaceutical supply chain performance, and to identify gaps that the current study intends to address. The review covers key concepts of supply chain management, pharmaceutical supply chain systems in Ethiopia, and integrated pharmaceutical logistics practices. It also discusses internal integration and its major components, as well as supply chain performance and its measurement dimensions. In addition, the chapter summarizes findings from previous empirical studies that have investigated the relationship between supply chain integration and organizational performance. Finally, it presents the conceptual framework that illustrates the relationship between the study variables and highlights the research gap that motivates this study.

2.1 Theoretical literature

2.1.1 Management of the Supply Chain

The term “supply chain management” refers to the process by which organizations coordinate with each other (e.g. suppliers, manufacturers, distributors, retailers, and customers) so that products, services, information, and financial resources can all move quickly and efficiently through the supply chain. Supply Chain Management encompasses activities such as sourcing, procurement, transportation, warehousing and production; delivery of goods and services to end users. The effective implementation of Supply Chain Management practices will result in increased operational efficiency, decreased costs, and improved customer satisfaction (Hasan, Zulkifli, Malak, and Nizaroyani, 2016).

Supply Chain Management is much more than just moving physical products; it involves working closely with all supply chain partners to share information, coordinate efforts, and collaborate on solutions through the use of integrated solutions. Companies are relying more and more on integrated systems or solutions to help them improve decision-making, transparency, and responsiveness to their supply chain operations. As a result, the use of technology (e.g.,

enterprise resource planning systems (ERP), digital platforms, and artificial intelligence) has significantly improved the operational performance and visibility of supply chains (Chopra & Meindl, 2019).

In the healthcare industry, Supply Chain Management is critical because it has a direct impact on the delivery of healthcare services and patient care. The management of the pharmaceutical supply chain ensures that there is access to the right quantity and quality of drugs and medical supplies, and at the right time (Christopher, 2016). A properly functioning healthcare supply chain provides continuous access to the essential pharmaceutical products necessary for delivering quality healthcare and improving patient outcomes.

SCM has developed from a conventional logistics-focused role to a more integrated and strategic field (Monczka et al., 2020), contemporary SCM entails end-to-end integration of all activities, such as supplier management, production planning, inventory management, distribution, and customer service. This integration is critical to enhancing agility and responsiveness in uncertain and changing situations. Advanced technologies like digital platforms, artificial intelligence (AI), and enterprise resource planning (ERP) have enhanced visibility, traceability, and decision-making in SCM, resulting in its further transformation (Ivanov & Dolgui, 2021).

Supply chain effectiveness is heavily reliant on the extent to which the departments and external partners involved are integrated. Companies that have greater levels of internal coordination and collaboration will tend to achieve higher levels of operational and financial performance due to improvements in the flow of information and alignment of organization processes. In the current competitive landscape, companies must define integrated supply chain strategies that allow for flexibility, efficiency, and long-term sustainability.

PSCM guarantees that high-quality, safe, and effective medications are accessible at the appropriate time and location. The World Health Organization (WHO, 2023) states that a functional healthcare supply chain system is necessary for achieving universal health coverage and guaranteeing access to vital medications.

According to Flynn et al. (2010), internal integration among an organization's departments is necessary for achieving successful external integration and overall supply chain performance. In a similar vein, Huo, Zhao, and Lai (2014) discovered that businesses with greater supply chain

integration tend to have superior operational and financial results because of improved coordination, knowledge sharing, and process alignment. Additionally, SCM generates benefits their businesses, customers, and stakeholders who engage with one another along the supply chain (Estampea et al. 2013). Businesses must meticulously craft their business plans in order to establish a long-term competitive advantage in today's complicated and ever-changing commercial world. As a result, the ability of businesses to plan and develop plans is crucial (Chih, et al., 2016).

2.1.2 Ethiopia's pharmaceutical supply chain

The Ethiopian pharmaceutical supply chain system consists of both public and private distribution of pharmaceuticals. In the public sector, the Ethiopian Pharmaceuticals Supply Service (EPS) is responsible for all forecasting, procurement, storage, inventory management, and distribution of pharmaceuticals to health facilities. All pharmaceuticals coming into Ethiopia are first shipped from the point of entry to a central warehouse located in Addis Ababa and subsequently distributed to regions, hospitals, and health centers throughout the country (Sutton and Kellow, 2010). The pharmaceutical supply chain in Ethiopia has been identified as a crucial component of the national healthcare system, responsible for assuring the availability, accessibility, affordability, and quality of essential medicines across health facilities. In spite of numerous reforms and strategic initiatives, the system still has structural, operational, and managerial issues.

Ethiopia has implemented new systems such as the Integrated Pharmaceutical Logistics System (IPLS) and Logistics Management Information Systems (LMIS) to facilitate more efficient and transparent use of resources. These initiatives will enhance inventory management, reporting processes, and drug distribution systems in public sector health care facilities (Federal Ministry of Health, 2015).

According to empirical evidence, the Ethiopian pharmaceutical supply chain suffers from regular stock-outs, ineffective forecasting, inadequate coordination, and inadequate communication between different levels of the healthcare system. For instance, research carried out in Addis Ababa's public hospitals and health centers showed that medication shortages and supply disruptions are largely caused by a lack of coordination between the procurement, pharmacy, and storage sections (Nega, 2017;). Similarly, inadequate demand forecasting, procurement delays,

and fragmented distribution networks have all been identified as significant obstacles impacting supply chain performance (Bilal et al., 2024).

2.1.3 Integrated Pharmaceutical Logistics System

The main components of the integrated pharmaceutical logistics system, a pull system created by EPSA, are the necessary data items that are routinely reported from health institutions every other month. EPSA delivers medications and supplies to public health facilities across the nation through its distribution centers (Hubs) (PFSA, 2012).

The Inpatient Pharmacy Logistics System (IPLS), is a single platform for reporting and distributing medicines, as well as for forecasting and managing inventories, and re-supplying hospitals and health facilities. Every public health facility must submit its inventory report and requisition forms on a regular schedule to report on how much they have in stock and how much they consumed during that time period. With that information, the IPLS is able to calculate how much each hospital and health center needs to replenish their stock and allow the health facility to keep enough inventories on hand (PFSA, 2015). EPSA is in charge of acquiring and delivering pharmaceuticals for the public sector. The integrated pharmaceuticals logistics system (IPLS), which EPSA created and implemented, is intended to ensure that patients receive the medications they require, which is its primary goal.

The reporting and resupply schedules are determined by IPPLS. As a result, health institutions (hospitals and health centers) are required to fill out the Report and Requisition Form (RRF) every two months for program pharmaceuticals, the data of which will be used to calculate the quantity of re-supply. For each health facility in the system, the maximum months of stock, minimum months of stock, and an emergency order point have been set to help ensure sufficient inventory levels. In accordance with the facilities review period, which may be every two months, every quarter, or every six months, health centers and hospitals will complete the RRF for Revolving Drug Fund (RDF) pharmaceuticals and pick up products from associated EPSA branches (PFSA, 2014).

As well as have established minimum (lowest) and maximum (highest) levels of inventory and established an emergency order point for emergency orders of medicines, the IPLS is tasked with providing an efficient method to avoid running out of stock or overstocking hospitals and health centers with medicines. Health facilities must follow the established reporting schedule in order

to requisition and receive pharmaceuticals from the EPSS Distributing Hubs. Additionally, the IPLS will have established standard operating procedures (SOP's) concerning the pharmaceutical supply chain's project participants and will also define reporting formats, logistics guidance, and operating instructions to assist with effective, timely decision-making, and coordination among the users of the health facilities.

2.1.4 Integration of the Supply Chain

Companies often integrate their supply chain systems with their channel partners in order to improve efficiency. The advancements in supply chain management in the form of supply chain integration had not only provided the opportunity to lower expenses but also to boost the firms' revenues, earnings, and performance. However, it also mentioned that the channel members' integration of supply chain management had certain difficulties. Information sharing was the most crucial aspect of supply chain integration (Awad & Nassar, 2010).

Mutual understanding serves as the foundation for establishing strong and enduring relationships between supply chain members, which in turn fosters more interaction between them. To succeed in today's business climate, supply chain participants must work together. Mutual understanding and willingness to keep the relationship going are essential foundations for long-term partnerships that are formed between supply chain partners through collaboration (Ismail Abushaikha, 2014).

Members of a supply chain are compelled by a number of factors to adopt collaborative and integrated supply chain methods. The primary drivers of supply chain integration in a company are the need for supply chain agility, the need for cost savings, profit motives, customer satisfaction, the need for collaboration with other businesses, and improved supplier relationships (Lisanza, 2013).

Therefore, specialization can only be a component of a company's success in today's ever-changing marketplace. Every component of the company that was previously split up for the sake of efficiency must now be reassembled in a way that optimizes results for customers and boosts overall productivity. For a firm to survive, its internal and external operations must be integrated (Chad and Mark, 2016).

Strategic supply chain integration initiatives include integrating communication, operations, processes, and locations throughout the supply chain in order to establish a productive and integrated system that facilitates ongoing communication between customers, suppliers, producers, and other supply chain participants. The three fundamental forms of Supply Chain Integration (SCI) are customer integration, internal integration, and supplier integration (Lai et al, 2012).

Integrating suppliers involves getting operational, technical, and financial data from the supplier. Data sharing between manufacturers and suppliers may include inventory levels, demand projections, and manufacturing strategies. By sharing this information, the firm is able to improve the product and production needs as well as make better use of the supplier's and its own cost structure and capabilities (Zahra et al., 2013).

Integration within all internal departments, from incoming materials to distribution, is referred to as internal integration. In order to satisfy customers' needs, it entails integrating departments and functions under the manufacturer's control. This implies that additional thought should be given to interaction in the middle of functional departments, such as manufacturing, purchasing, logistics, inventory, marketing, sales, and distribution (Zahra et al., 2013).

2.1.5 Internal Integration

In the field of organizational theory, the idea of internal integration (also referred to as intra organizational or inter functional) is well-established. Lawrence and Lorsch (1967) developed the crucial concept of "the quality of the collaborating status among departments necessary to perform the effort unit according to the environmental demands." "The degree to which an organization structures its own organizational strategies, practices, and processes into collaborative, synchronized processes, in order to fulfill its customers' requirements and efficiently interact with its suppliers and "the chain of activities or functions within a company that results in providing a product to the customer"" is how internal integration is defined in the SCM context (Flynn; Huo; Zhao, 2010).

The intentional and planned alignment of business operations and activities inside an organization is known as internal integration, and it is structured to maximize the firm's output. Before attempting external integration, SCI begins with internal integration between an organization's various functions and departments (Basnet, 2013).

Cross-functional collaboration, which is the collaboration of various departments in the creation of new products or process improvement, is another aspect of internal integration. Internal integration acknowledges that the various roles inside a business should function as an integrated process rather than in functional silos (Zhao et al., 2011). Efforts toward external integration will proceed more slowly and with greater difficulty in the absence of an internal culture that prioritizes integration (Yunus and Tadisina, 2016).

According to the findings, successful external integration with suppliers in global supply chains depends on the internal integration between functional areas (Horn, Scheffler, and Schiele, 2014). According to the literature, before beginning external integration, businesses must first establish a significant level of cooperation across their internal operations (Cagliano et al., 2006). Internal integration is linked to the global performance's maturity (Horn, Scheffler and Schiele, 2014).

Internal Integration are to the degree to which different departments and units within in organizational work tougher in a coordinated to achieve common company goals. It refers the sharing of information, collaboration at departments, and the alignment of operational activities different organization. Effective organizational integration involves the organizations to enhance communication, decease operational conflicts, and improve overall organizational performance. Internal Integration strengths organization at departments and increase the flow of resources and information within organizations, which contributes to operational efficiency and customers satisfaction. According to Huo et.al (2022). Implies that organizations with strong internal integration are more capable of responding to market changes and supply chain uncertainties.

Additional, Internal Integration contributed strategic decision making by improving that departments such as procurement, production, logistics, supply, inventory management and marketing operated with shared objectives and coordinated plan. It creates a unified organizational structure b their employee collaborated effectively and organizational resource were utilized efficiently. According the Dubey et al. (2003), indicates that promote Internal Integration experience better operational flexibility, increased service quality delivery and improved competitive advantage in market. Whenever, Internal Integration is considered an important factor in strengthen organizational performance and supply chain effectiveness.

2.1.5.1 Information Integration

Information Integration are the process of sharing accurate, timely and relevant information at different departments and supply chain members. It involves organizations to coordinate activities effectively and make informed decisions based on real time data. Information Integration included the use of information technology system, communication networks and digital platforms that facilitated information exchange at employees and departments. According Flynn et al. (2021), information integration increase operational transparency and decrease late in organizational processes by enabling quick access to important information.

Further, information integration improves organizational efficiency by decreasing information gaps and increasing coordination among departments. Organizations that implemented integrated information system are able to forecast demand accurately, manage inventory effectively, and respond quickly to customer needs. According to Yu etal. (2023) reveals that information integration significantly contributed to supply chain responsiveness and organizational performance. This, effective information integration is essential for increasing commun9ication and supporting strategic organizational decisions.

Moreover, information integration strengthens collaborations between internal departments and external supply chain partners but improving transparency and believes. Organizational that invests in advanced informational technologies such as Enterprises Resource Planning (ERP) systems and cloud based communication platforms increasing operational efficiency and decreasing late in decision making processes. According to Wong etal. (2024), effective information integration contributed significantly to organizational competitiveness by increasing communication flow and supporting strategic decision making. Thus, informational integration plays an essential function in improving organizational performance and supply chain effectiveness.

2.1.5.2 Coordination and Resource Sharing

Coordination and resource sharing refer the collaborative use of organizational resources, skill and capabilities at departments to achieve common objectives. Effective coordination improve that organizational activities were aligned and departments work tougher efficiently. Resource sharing to be included sharing equipment, information, technology, financial resources and human skill among different functions within the organization. According to Prajogo et al.

(2022), coordination and resource sharing increasing operational efficiency and decreasing duplication of efforts within organizations.

In addition, organizations that encourage coordination and resource sharing are better able to decrease operational costs and increase productivity. Effective coordination's improve teamwork, strengths organizational relationship, and supports smooth workflow across departments. According to Kim etal (2024) implies that coordinated resource utilization improves organizational flexibility and enhances service performance. Therefore, coordination and resource sharing in were important components of successful internal integration and organizational effectiveness, moreover organizational that contributed coordination and resource sharing are better able to decrease operational costs and increase productivity. Effective coordination ion increase teamwork, strengths organizational relationship and support smooth workflow across departments

Furthermore, coordination and resource sharing support innovation and problem solving within organizations by encouraging knowledge exchange and collaborative decision knowledge exchange and collaborative decision making. Organizational that improves teamwork and collective resource utilization were better positioned to achieve sustainable competitive advantage. Effective coordination also improves employee cooperation and decrease late in operational processes. According to Dubey etal. (2023), organizational that integrate coordination and resource sharing practices into their operational systems achieve increase supply chain performance and customer satisfaction. Thus, coordination and resources sharing are functions factors strengthening internal integration and overall organizational effectiveness.

2.1.5.3 Links between Organizational Relationships

Links between organizational; relationship reveals to the level of interaction, communication and collaboration that exists among departments and employees within an organization. Strong organizational relationships facilitate support the achievement of organizational goals through teamwork and mutual understanding. According to Chen et al (2021), strong organizational relationship increase communication efficiency and create a positive working environment that improve employee performance.

Moreover, effective organizational relationship encourages knowledge sharing and increase coordination among departments. Organizations with strong internal relationships were more

capable of managing operational challenges and adapting to environmental changes. According to Awan etal (2023).implies that collaborative organizational relationships contribute significantly to operational relationships contribute significantly to operational success and customer satisfaction. Therefore, marinating strong links between organizational relationship is essential for improve internal integration and organizational performance.

2.1.6 Efficiency of the Supply Chain

Supply chain efficiency are they ability of a organization to manage the flow of goods, services, information and resources effectively while decreasing costs and increasing customer satisfaction. Efficient supply chain enable organizational to driver products and services on time, maintain product quality and respond quickly to market demands. Supply chain efficiency in influenced by factors in terms of coordination, technology adoption, resource management and organizational competitiveness and operational performances by decreasing waste and increasing service delivery.

In additions, supply chain efficiency helps organizations maintain strong customer relationships and achieve sustainable business performances. Organizational with efficient supply chains can manage inventory effectively decreasing lead times and increasing profitability. According to Kache etal (2023) reveal that supply chain efficiency influences customers satisfactions and organizational growth. Therefore, increasing supply chain efficiency is important for achieving long term organizational success.

The organization should strive to develop a valuable, top-level conversation with supply chain partners in order to increase the quality and engagement throughout the supply chain in order to promote and substitute productive collaboration. In order to integrate activities connected to the organizational system where the quality of communication aids in the integration of the sustainable supply chain effective communication is a must. The bottom line is that the quality of communication is somewhat related to the integration of the supply chain, and this relationship may have both direct and indirect effects (Liu, 2013).

2.1.6.1 Adaptability

Creating customer satisfaction and gaining competitive advantage are the ultimate accomplishments in an organization's performance (Flynn et al., 2010). A system's flexibility is demonstrated by its ability to proactively and reactively change its parameters in response to

uncertainties that may arise from both internal and external sources. The primary goal of flexibility in the supply chain is to reduce the amount of time it takes to respond to client requests and to make value-added operations simpler. Businesses must be customer-oriented since the complexity of business processes is increasing in the current business environment. Outsourcing some of its products to other companies is one of the ways a company can take various actions to enhance its offerings and boost its agility (Singh &Sharma, 2014).

Adaptability refers to the ability of a supply chain to a adjust quickly to changes in market conditions, customers performances and environmental uncertainties. An adaptable supply chain enhance organizational to respond effectively to disruptions and changing business environments. Adaptability is functions in maintaining operational continuity and improving customer satisfaction during unexpected situations. According to Iyanoy (2022), adaptable supply chains are more resilient and capable of maintain operational performances during disruptions.

Furthermore, organizations with an adaptable supply chain can easily modify production process, sourcing strategies and distribution systems to meet changing customers' demands. Adaptability improve innovation and supports systems to meet changing customer demands. Adaptability increase innovation and supports organizational competitiveness in dynamic markets. According to Ali etal (2024) reveals that supply chain adaptability significantly increases operational flexibility and market responsiveness. Therefore, adaptability is a key determinant of supply chain efficiency and organizational sustainability.

2.1.6.2 Delivery

The level to which a company's products and services satisfy customer expectations can be considered its delivery performance. It serves as a gauge of the supply chain's capacity to provide goods and services to the consumer. Lead time and delivery time are the conventional metrics used to assess performance. Time, lead time, and cycle time were defined in various studies. The interval between finishing one job or task and beginning the next is known as the cycle time, which is the time between when a process or task is started and when it is started again. The amount of time needed from when the customer places the order until the product or service is delivered (company and supplier), encompassing production, transportation, processing, warehousing, and delivery of the product or service to the end consumer (Gimenez, et al., 2011).

Delivery is seen in both ways in the manufacturing sector, from the side of the suppliers and the side of the clients. The supplier will have a greater procurement cost and may lose sales to its end customers if the delivery is delayed. Delivery reveals to ability of a supply chain to provide products and service to customers at the right time, place and quantity. Effective delivery performances improve customer's satisfaction and strengths organizational reputation. Delivery efficiency in terms of transportation systems, inventory management, coordination and logistics planning. According to Mentzeretal(2021), timely ad reliable delivery is one of the most important indicators of supply chain performance.

Furthermore, organizations that maintain efficient delivery systems were able to decreasing transportation late, increasing customer trust, and decreasing market competitiveness. Modern logistics technologies and integrated transportation systems had increasing delivery performance in many organizations. According to Sarkis et al. (2023) reveals that effective delivery systems positively influence customer loyalty and operational efficiency. Therefore, delivery performance plays a significant function in determining supply chain efficiency.

2.1.6.3 Price

Decreasing expenditures is one method for raising operational efficiency. The sum of all expenses, including inbound and outbound freight, warehouse costs, third-party storage costs, order processing costs, direct labor costs, and administrative and service costs, is referred to as cost (Vaidya and Hudnurkar, 2012). "The total costs associated with operating the supply chain" is how the cost was described by Cirtita and Segura (2012). The plan is based on lowering total operational costs by minimizing inventories, making the most use of resources, turning around work-in-progress inventories, and getting rid of non-value-added operations. Proper cost management entails using resources wisely to maximize the efficiency of the organization in order to generate value for customers. This reasoning will result in customer satisfaction, loyalty, and long-term financial stability for the business. Managing decisions is the key to effectively controlling expenditures (Patterso, 2007). Valuable resource endowment results from cost management, which in turn generates value for the end consumers and enhances customer satisfaction (Lu et al., 2017).

Price reveals to the cost efficiency of supply chain operations in delivering products and services to customers. Competitive pricing is functions for attracting customers and marinating

profitability in competitive markets. Efficient supply chain helps organizations decreasing operational costs through effective resource utilization, increasing coordination and waste reductions. According to (2021), cost efficient operational enhance firms to achieve completive advantage through lower product prices and increasing value creation.

In additions, supply chain efficiency contributes to price by decreasing unnecessary operational expenses and increasing productivity. Organizations with efficient procurement and logistics systems were better positioned to offer affordable products without compromising quality. According to Bag etal, (2013) implies that cost reduction strategies within supply chains positively is an important evaluate of supply chain effectiveness's.

2.1.6.4 Quality

Quality reveals to the ability of a supply chain to consistently provide products and services that meet customer expectations and organizational standards. High quality supply chain operations increase customer satisfaction, decreasing product defects and strengthen organizational reputation. Quality management refers effective monitoring, continues improvement and compliance with established standards throughout the supply chain process. According to deeming principles, quality increase contributes significantly to operational efficiency and customer satisfaction. According to continue to apply this principle in modern supply chain management practice (Sigh etal, 2022).

Furthermore, an organization that implies equality within their supply chain were more likely to achieve customer loyalty and long-term business success. Quality assurance systems help organizational identify operational problems early and increasing service reliability. According to Zhang etal (2024) implies that quality focused supply chain practices positively influence operational performance and customer retention. Therefore, quality remains a critical factor in evaluating supply chain efficiency and organizational competitiveness.

2.2 Empirical Literature

Studies in empirical literature have shown a consistent relationship between internal integration and supply chain performance, across various types of organizations and sectors. Researchers have demonstrated that the effective integration of an organization's internal processes results in

improvements in the operational efficiency, service delivery and overall performance of organizations (Lisanaza, 2013). Organizations that have high levels of communication and coordination internally typically experience better outcomes within their supply chains, including less delay to product availability, better inventory management, and faster responses to client demands. There is a body of literature that supports the idea that sharing resources and working cooperatively among departments within organizations is a key contributor to improving supply chain efficiencies.

Conversely, some studies have shown inconsistent results; this suggests that the relationship between Internal Integration and Supply Chain Performance varies by organizational structure, technical capability, and management practices. There is a need for more research in the area of Internal Integration and Supply Chain Performance, particularly related to public healthcare organizations located in developing countries.

Sahin and Robinson (2005) came to the conclusion that the greatest advantage of SC cooperation is increased coordination, while information sharing merely unlocks a small fraction of the potential advantages of channel integration. According to Rodriguez et al. (2004), there may not be a significant impact on performance if internal and external activities are kept apart. However, performance is improved when internal business processes are integrated with internal and external operations.

In a study on logistical service performance and supply chain collaboration, Stank et al. (2001) carried out research. The study's conclusion, which employed internal and external collaboration as variables, revealed that internal collaboration has a beneficial effect on the delivery of logistical services. Additionally, Liu (2013) wrote a thesis on how market orientation and supply chain integration affect business performance. Customer focus, operational coordination, information exchange, and operational and financial results were the variables covered by the study. According to the study results, information sharing improves operational performance but has little immediate effect on business performance. Conversely, customer orientation tempers the link between SCI and performance.

Different studies had conducted on the relationship between internal organizational integration and supply chain performances in different sectors, included the hospitality industry. This study major focused on how informational integration, coordination communication and resource

sharing at organizational departments influence supply chain efficiency, service quality and operational performance. Internal organizational integration had become an important factor in increasing pharmaceutical supply chain performance because pharmaceuticals products require effective coordination, timely delivery, quality assurance and efficient inventory management. According to Flynn etal (2021), organizations with strong internal integration systems achieve greater supply chain responsiveness and operational efficiency compared to organizational with small internal coordination systems. The study reveals that the information sharing and interdepartmental collaboration significantly Increase supply chain performance outcomes.

According to Huo etal (2022) to examine the effect of internal integration on supply chain performance at manufacturing firms in Asia. The result implies that effective communication and coordination between procurement, logistics, production and marketing departments, logistics, production and marketing departments positively affect supply chain adaptability and customer satisfaction. The study also reveals that organizations with integrated operational systems experience lower operational costs and increased delivery performance. According to Dubey et al (2023). That resource sharing and internal collaboration improve organizational flexibility and increased supply chain sustainability. Their study concluded improve that firms that encourage departmental cooperation are more capable of responding to market uncertainties and operation disruptions.

Internal organizational integration plays a critical role in improving the continuous availability of medicines and healthcare products. Pharmaceutical supply chains require strong coordination among procurement units, warehouse departments, transportation systems, and healthcare facilities to maintain product quality and timely delivery. According to Ivanvo (2022) reveals that internal international increase pharmaceutical supply chain resilience by improving information flow, decreasing late and strengthening inventory control systems. The study reveals highlighted that integrated pharmaceutical supply chain are more effective in managing supply chain disruptions and maintaining service continuity during emergencies.

According to Kimet.al (2024) indicates that the relationship between organizational coordination and pharmaceutical supply chain performance. The result reveals that organizations with strong coordination mechanisms achieve higher delivery performances, increased product quality and better customer satisfaction. The study also reveals that the use of integrated informational

system significantly increase decision making and operational efficiency within pharmaceutical organizations. Thus, empirical evidence reveals that internal organizational integration positively influences pharmaceutical supply chain performances through increase coordination, communication, adaptability and resource utilization.

Effect of Internal Organizational Integration Dimensions on Pharmaceutical Supply Chain Performance and Hypothesis Development

2.2.1 Information Integration and Pharmaceutical Supply Chain Performance

Information integration means how accurate real-time relevant information is shared across all Organization departments for coordination and decision-making purposes. The use of proper Information Integration allows Organizations to improve inventory visibility, lower levels of disparity within the supply chain, increase Forecasting Accuracy, and respond quickly to customer requirements. Flynn, Huo, & Zhao (2010) state that Information Integration helps organizations communicate between their individual departments which enhances Supply Chain Performance through improved Coordination and Efficiency of Operations.

Many different empirical studies have reported a positive relationship between Information Integration and SCM Performance. Liu (2013) found that because there is a high level of Information Sharing, Operations Performance is improved via better Coordination, thus decreasing Supply Chain Process delays. In a similar vein, Ivanov (2022) reported that Integrated Information Systems increase Resilience of the Pharmaceutical Supply Chain by improving Inventory Accuracy and decreasing Instances of Operation Disruption. Wong et.al (2024) found that a Company with an Effective Information Integration System achieves a higher level of Operational Efficiency and enhanced Service Performance.

H1: Information Integration had a positive and significant effect on Pharmaceutical supply chain performance

2.2.2 Coordination and Resource Sharing and Pharmaceutical Supply Chain Performance

Coordination and resource sharing are the shared use of a company's resources, competencies, and expertise, across a variety of different departments, for the purpose of achieving shared goals. By improving coordination within an organization, these activities can lead to

improvements in communication, reductions in redundant activities, enhanced utilization of resources, and increased operational efficiency. As Prajogo et al. (2022) state, increase coordination and resource sharing can improve productivity and enhance supply chain success.

According to Huo etal (2022) reveal that coordination between the procurement, logistics, and operations functions improve a supply chain's ability to use adapt to changing market conditions and improves customer satisfaction. Kim et al. (2024) reveals that coordinating the use of resources supports operational flexibility and increase the overall performance of service delivery. Finally, Dubey et al. (2023) concluded that organizations that foster collaborative relationships between different departments in their use of resources achieve higher levels of supply chain sustainability and operational efficiency.

H2: Coordination and resource sharing had a positive and significant effect on Pharmaceutical supply chain performance.

2.2.3 Organizational Relationship Linkage and Pharmaceutical Supply Chain Performance

Organizational relationship linkage is how well a company communicates, collaborates, trusts, and interacts between employees or departments. When relationships within an organization are strong, they lead to more open communication about sharing information, better teamwork and coordination amongst departments' groups, and ultimately resolving issues more effectively. Chen et al. (2021) say that if the relationships between organizations are strong, they will have increased efficiency in communication; thereby affecting employees' and the overall organization's performance positively.

Awan et al. (2023) demonstrated a significant relationship between collaborative organizational relationships and operational effectiveness and hence increased customer satisfaction. Flynn et al. (2010) indicated companies have improved supply chain responsiveness and performance outcomes when they have developed great inter-departmental relationships. Kim et al. (2024) relatively better pharmacy supply chain prescription through improved coordination, enhanced decision-making capabilities, and improved delivery performance when they had built strong organizational relationships.

H3: Organizational relationship linkage have a positive and significant effect on Pharmaceutical supply chain performance.

2.3 Conceptual framework

The individual effects that demonstrated the distinct impact of internal integration on an organization's success served as the basis for this study's conceptual framework. In the past, many aspects were used to explain supply chain integration. Information integration (II), organizational relationship linking (ORL), and coordination and resource sharing (CRS) were identified as components of SCI, according to Lee (2000). Five associated features of SCI were identified by Bagchi et al. (2005b): communication and information sharing; collaboration and shared decision-making; cooperation leading to hazard; profit and cost sharing (operational and strategic collaboration); and sharing of ideas, institutional norms, and expertise. Two key components of SCI were thought to be the degree of information exchange and the coordination of decision-making (Sahin and Robinson, 2002, 2005). Coordination and resource sharing have been shown to directly and favorably affect performance (Kulp et al., 2004; Shahin and Robinson, 2005). According to Bagchi et al. (2005b), supply chain integration is positively impacted by organizational relationship linkage, which can then have an impact on performance.

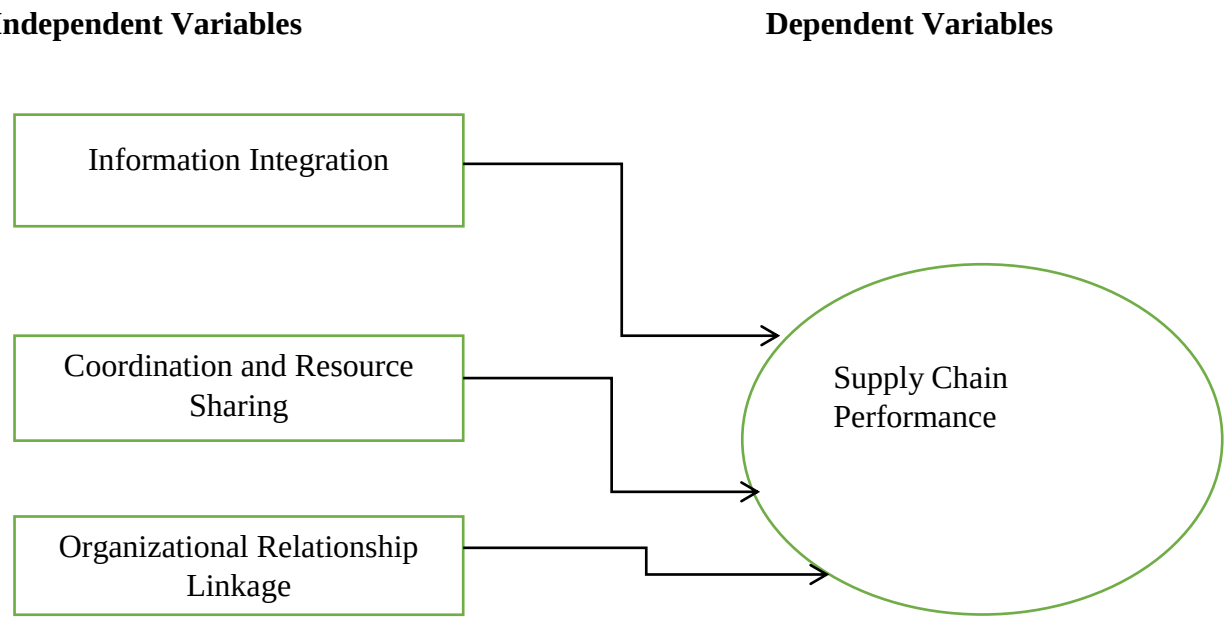


Figure 2.1: Conceptual Framework Source: (Rafaela et al, 2012)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Description of the study area

At Tikur Anbessa Specialized Hospital (often called "Black Lion Hospital"), which is one of the largest referral/teaching hospitals in Ethiopia, this research project was conducted. The hospital is located in Addis Ababa and operated under Addis Ababa University in collaboration with the federal Ministry of Health. Black lion hospital have critical role in the Ethiopia Healthcare system due to the high volume and complexity of cases it handles daily. The hospital has numerous operational units that are responsible for manufacturer procurement, storage and inventory management, and distribution of medications to patients. The pharmacy department, procurement office, warehouse management, and distribution sections number among these various operational units, all contributing in some way to the various aspects related to pharmaceutical supply chain management.

3.2 Research Design and Approach

The study was used quantitative research approach because numerical data was collected through structured questionnaires and analyzed using statistical technique A research design represents an outline for conducting research, creating a connection between research questions and the methods used to collect and analyze data (Ornstein, 2013).. A research design will provide guidance to researchers with regard to how research should be conducted and how to achieve study goals in an effective manner.

To answer the research questions for this study, both descriptive and explanatory research designs were used. A descriptive research design was used to describe the current state of internal integration practices and overall pharmaceutical supply chain performance at Black Lion Hospital. The explanatory research design was used to investigate whether there is a causal link between dimensions of internal integration and overall pharmaceutical supply chain performance. The research focused on three independent variables: information integration, coordination and resource sharing, and organizational relationship linking. The influence of each independent variable on pharmaceutical supply chain performance at Black Lion Hospital was examined.

3.3. Target Population

Target Population means, the entire mass of observations, the parent group from which a sample is to be informed. The research metrology population means the characteristics of a specific group (Singh, 2006). Based on this target population is the collection of elements objects that possess the information sought by the researcher and about which inferences are to be made.

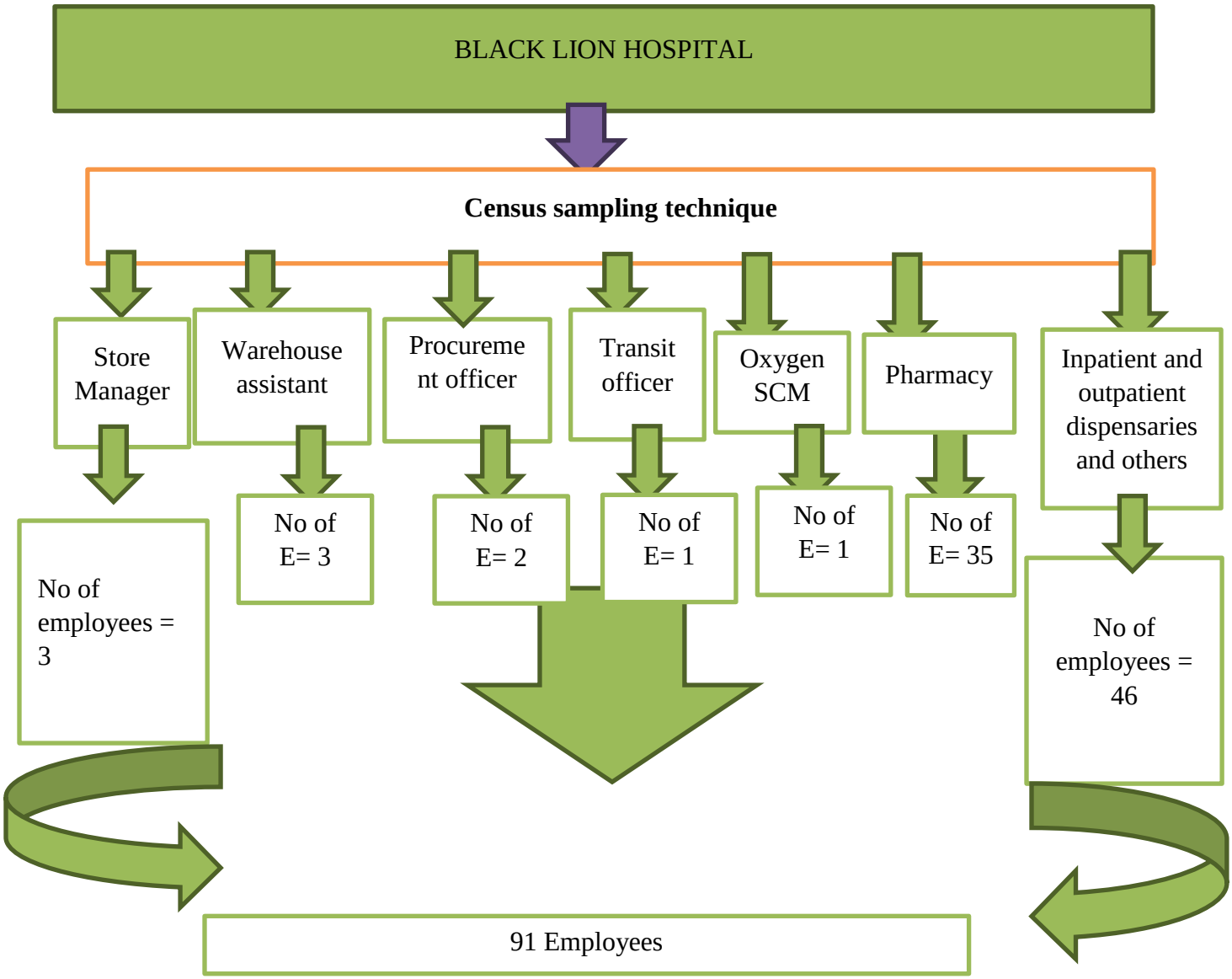


Figure 3.2 Schematic presentation of the sampling procedure to select study participants

The target populations are employees of Black Lion Hospital Addis Ababa those are members of pharmacy professionals. They are ninety-one (91) pharmacy professionals' staffs. 3 store manager, 3 warehouses assistant, 2 procurement officer, 1 transit officer, 1 oxygen supply chain management, 35 all pharmacy band 46 inpatient and outpatient dispensaries and others. Totally 91 populations, those took part in pharmaceutical inventory management and are currently available in the Black Lion Hospital was used as source of primary information.

3.4 Sampling technique

Since the target population was small and manageable, a census method was used and all members of the population were included.

3.5 Types and source of data

3.5.1 Source of Data

The data for this study was collected from primary sources to ensure a comprehensive analysis of the effect of internal integration on pharmaceutical supply chain performance. Primary data was collected directly from respondents working at Black Lion Hospital through structured questionnaires. Primary data are original in nature and are collected for the first time for the specific purpose of the study. The use of primary data allows the researcher to obtain firsthand information regarding management support, information technology utilization, staff competency, and on pharmaceutical supply chain performance practices within the hospital. The questionnaire was prepared in English and structured into several sections. The first section was focus on the independent variables, namely information integration, coordination and resource sharing and organizational relationship linkage.

3.5.2 Measurement Scales

In this study all the variables are measured in 5-point Likert scale ranging from 1 (strongly disagree), to 5 (strongly agree). The independent variables include information integration, coordination and resource sharing and organizational relationship linkage. The dependent variable is pharmaceutical supply chain performance.

Table 3.1 Variables and the Measurement of Scales

S/N	Variable	Items	Scale to be used
1	Internal integration	Information Integration Coordination and resource sharing Organizational Relationship Linkage	5-point Likert scale
2	Pharmaceutical supply chain performance	pharmaceutical supply chain performance	5-point Likert scale

3.6. Method of Data Analysis

This research utilized a combination of descriptive and inferential statistics to analyze the collected data. To describe the characteristics of the respondents and their perceptions regarding supply chain performance and some form of internal integration, the Descriptive Statistics that were utilized included collecting means, frequencies, percentages and standard deviations. The use inferential statistics was used to determine how variables are associated with each other and to test the hypotheses of the study. The inferential statistics used for this study were primarily correlation and regression analysis to determine both the strength and direction of the relationship between the variables. All analyses were performed using a statistical software to provide accurate and reliable results.

3.6.1 Descriptive Analysis

The descriptive results were presented using tables, frequency distributions, and percentages, mean values and standard deviations to provide a clear and condensed picture of respondent's demographic characteristics and the key studs variables. Specifically, mean and standard deviations values was computed for each construct to describe the general level Internal integration on Pharmaceutical supply chain performance among employees of the Black Lion Hospital.

3.6.2. Pearson Correlation Analysis

In this study, Pearson correlation analysis was used to determine the relationships between the studying variables i.e. effect of internal integration on Pharmaceutical supply chain performance in the case of Black Lion Hospital.

3.6.3. Multiple Regressions Analysis

Analyses using multiple regressions allowed for investigation of how all three internal integration variables worked together to influence the performance of pharmaceutical supply chains. This technique permits the assessment of the effect that three independent variables can have at the same time on a dependent variable.

The regression analysis incorporated three internal integration dimensions: information integration; coordination and resource sharing; and organizational relationship linking. These results were used to develop the hypotheses, assess the level of statistical significance for each independent variable, and evaluate how contributing to supply chain performance varies among these internal integration dimensions when controlling for other variables.

All p-values from the regression model were evaluated against a predetermined level of significance to determine if that particular variable had a statistically significant effect on performance.

Table 3.2 Measurement of research variables

Variable	Indicators	Measurement scale
Information integration (II)	information share, database access	5- point Likert
Coordination & Resource Sharing	Resource Utilization, Teamwork	5- point Likert
Organizational Relationship Linkage	Communication, Collaboration	5- point Likert
Supply Chain Performance	Cost, quality ,responsive , ability	5- point Likert

Regress functions

The general objective of using regression equations is to make the researcher more effective at describing, understanding, predicting, and controlling the stated variables.

$Y= \alpha+ \beta x1+\beta x2+\beta x3+e$

Where Y is the dependent variable- PSCP (Pharmitic supply chain performance), α is constant X1 information integration; X2 coordination and resource sharing; and X3 organizational relationship linking. Beta is the intercept term it refers to the coefficient of their respective independent variables which measures the change in the mean value of Y, per unit change.

3.7. Validity and Reliability Test

3.7.1. Validity

The research instrument's quality has been assessed by conducting validity and reliability tests. To measure what the instrument intends, it must be valid. We have used expert feedback and compared it to our original research objectives to improve upon and better match what we wanted when creating the instrument (content validity check).

3.7.2 Reliability

Reliability indicates an instrument's ability to accurately measure a construction (or a phenomenon) over time. This quality was assessed with a statistic such as Cronbach's alpha to test the internal consistency of all of the items in the instrument's design. A high reliability statistic was found to indicate all of the items were going to be internally consistent (i.e., valid) for measuring the same construction; therefore, the instrument is a valid tool for obtaining data and conducting further analysis and research.

Table 3.3 Rule of Thumb of Cronbach's Alpha

NO	Cronbach's Alpha	Description
1	≥ to 0.9	Excellent
2	≥ 0.8 but less than 0.9	Good
3	≥0.7 but less than 0.8	Acceptable
4	≥ 0.6 but less than 0.7	Questionable
5	≥0.5 but less than 0.6	Poor
6	≤ 0.5	Unacceptable

Table Source: (Zikmund, 2010)

Accordingly, the questionnaire was developed in five scales ranging from five to one; where 1 represents strongly disagree, 2 disagree, 3 neutral (no opinion), 4 agree, and 5 strongly agree. To make easy interpretation, the following ranges of values were reassigned to each scale: mean scored value less than 3 considered as "Disagree", mean scored value greater than 3 considered as "Agree" and the mean scored value equal to 3 considered as "Neutral" (cited in Yonas, 2013). Descriptive statistics was used, and correlation and regression analysis was conducted for scale typed questionnaires.

Table 3.4 Cronbach Aplha

No	Section	No of item	Alpha Value
1	Informational integration	5	0.842
2	Coordination and resource sharing	5	0.711
3	Organizational Relationship Linkage	5	0.810
4	Supply chain performance	5	0.836

After coding and entry of data into SPSS version 27, the first analysis conducted to check the reliabilities of the scales used in the data collection instrument. According to Malhotra & Birks (2007), reliability is the extent to which a measurement reproduces consistent results if the process of measurement to be repeated. Cronbach-alpha, a widely used measure of internal consistency, run using SPSS version 27 and all the scales was used for this study are found to be reliable as their respective alpha values are higher than 0.7, and for most closer to 1.

3.8 Ethical Considerations

The study was conducted without fabrication or misrepresentation of the data. The researcher protected participants properly by ensuring that all data collected were used strictly for academic research and were treated as confidential information. Voluntary participants was not be pressured into participating. Participants are informed about the research, including its purpose, procedures and their rights.

CHAPTER FOUR
RESULTS AND DISCUSSION

4.1 Introduction

In this section will detail the interpretation and analysis of the gathered data regarding how well-integrated internal systems have an impact on performance of the supply chain in the pharmacy at Tikur Anbessa Specialty Hospital. The analysis also shows the results of using different statistical methods to help present the findings: variables characterizing each respondent, descriptive statistics providing a summary of some of these values, correlation analysis illustrating the correlation between these variables, and regression analysis correlating the variable to supply chain functionality.

4.2 Response Rate and Demographic Profile of the Respondents

Out of 91 sent, there were 85 completed and responded to by responding, which gives a 93.4% response rate; this level of response is considered to be very good for analyzing and interpreting data because it exceeds the minimum recommended level of response for a data collection method used in research.

Table 4.5 Response Rate of Respondents

	Number of questionnaires	**Percent**
Completed	**85**	**93.4%**
Not completed	**6**	**6.4%**
Total	**91**	**100%**

Source: own survey result, 2025

The responses of the demographic section of the research included the following study criteria of the respondents: the gender of each respondent, the age of each respondent, the educational background and occupation of each respondent, and work-related characteristics of each respondent that are specific to Black Lion Hospital. All data were analyzed using SPSS (Statistical Package for the Social Science) 27 software.

Table 4.6 Demographic profile and work experience of the respondents with black lion hospital

Variables	Category	Frequency	Percentage
1 Gender	Male	38	44.71
	Female	47	55.29
	Total	**85**	**100**
2 Age	Less than 25 Years	5	5.88
	26-34 Years	43	50.59
	35-44 Years	36	42.35
	45-54 Years	1	1.18
	Total	**85**	**100**
3 Level of education	Certificate	0	0
	Diploma	0	0
	First Degree (Bachelors)	53	62.35
	Master's Degree	32	37.65
	Total	**85**	**100**
4 **Occupation**	Pharmacy	78	91.76
	Warehouses assistant	3	3.53
	Procurement officer	2	2.35
	Store Manager	1	1.18
	Other	1	1.18
	Total	**85**	**100**

Source (Own Survey, 2026)

As shown in Table 4.6 **item 1**, 38 (44.71%) of the respondents were male, while 47 (55.29%) were female. The result indicates that female respondents slightly outnumbered male respondents in the study. This implies that female professionals constitute a significant proportion of the pharmaceutical workforce at Black Lion Hospital and actively participate in pharmaceutical supply chain activities.

Item 2 regarding age, 43 (50.59%) of the respondents were between 26 and 34 years old, 36 (42.35%) were between 35 and 44 years old, 5 (5.88%) were below 25 years old, and only 1 (1.18%) was between 45 and 54 years old. The findings reveal that the majority of respondents were within the economically productive age group of 26–34 years. This implies that most respondents are relatively young and are likely to possess the energy, adaptability, and technological skills necessary to support effective pharmaceutical supply chain operations.

Item 3 concerning educational qualifications, 53 (62.35%) of the respondents held a bachelor's degree, while 32 (37.65%) possessed a master's degree. The findings indicate that all respondents had higher education qualifications. This implies that the respondents have the educational background required to understand pharmaceutical supply chain processes and provide reliable information regarding internal organizational integration and supply chain performance.

Item 4 with regard to occupation, 78 (91.76%) of the respondents were pharmacy professionals, 3 (3.53%) were warehouse assistants, 2 (2.35%) were procurement officers, 1 (1.18%) was a store manager, and 1 (1.18%) belonged to other categories. The findings show that the majority of respondents were pharmacy professionals directly involved in pharmaceutical services and inventory management activities. This implies that the data collected were obtained from employees who possess direct experience and practical knowledge of pharmaceutical supply chain operations, thereby enhancing the credibility and reliability of the study findings.

4.3 Descriptive analysis of Internal Integration of pharmaceutical Supply Chain of Black Lion Hospital

As discussed in these preceding chapter of this thesis, based on the framework adapted from the study conducted by Zewdu Demissie (2020), internal organizational integration of the pharmaceutical supply chain was operationalized using three dimensions namely information integration, resource sharing and organizational relationships linkage. This dimension was used to measure the level of internal integration practices at Black Lion Hospital. The data collected from the selected respondents regarding each dimension were descriptively analyzed using mean scores and standard deviations as presented in the following subsections.

4.3.1 Information Integration Dimension

As discussed in the previous chapters, based on the framework adapted from previous empirical studies on supply chain integration, internal organizational integration was operationalized using three major dimensions namely Information Integration, Resource Sharing, and Organizational Relationship Linkage. The data collected from respondents at Black Lion Hospital regarding these dimensions were analyzed descriptively using mean scores and standard deviations as presented in the following subsections.

Table 4.7 interpretation of mean and standard deviation ranges

Mean range	Interpterion	SD range	Interpterion
1.00 -1.80	Strongly disagree	0.00-0.50	Very consistent
1.81-2.60	Disagree	0.51-1.00	Moderate variability
2.61-3.40	Neutral	1.01-1.50	High variability
3.41-4.2	Agree	1.51-2.00	Very High variability
4.21-5.00	Strongly Agree	>2.00	Extremely inconsistent

Table 4.8 Information integration

Item	Statement	N	Mean	SD
1	All employees are allowed to access all information they may require in execution of their tasks	85	3.24	.868
2	Employees utilize IT tools in facilitating information access	85	4.65	.481
3	Different departments engage in information exchanges	85	4.04	.241
4	All functional departments have information access to inventory level of pharmaceuticals	85	3.56	.698
5	Common Computerized data base system available	85	4.13	.371
	Grand mean		3.924	0.665

Source (Own Survey, 2026)

As depicted in the above table 4.7 item1 shows that the all employees are allowed to access all information they may require in execution of their tasks had mean score of 3.25 and standard deviation of 0.868. This implies that respondents uncertainly that employees have access to the information needed to perform their duties. Therefore, the moderate mean value may imply that some employees still experiences limitations in accessing necessary information.

Above table item 2 shows that employees utilize IT tools in facilitating information access has the highest mean score of 4.65 with standard deviation of 0.481. This implies that positive

perception among respondents that employees actively use information technology tools to facilitate information access. The low standard deviation further shows consistency in responses.

Item 3 reveal that the statement of different departments exchanges in information exchanges had mean score of 4.04 and standard deviation of 0.241. This shows that respondents positive perceptions that departments regular exchange information with one another. The very low standard deviation implies highly consistent responses among participants. The result reveals that interdepartmental communication and coordination are effectively practiced within the hospitality.

Item 4, **shows** that the all functional departments have information access to inventory level of pharmaceuticals had mean score value of 3.56 and standard deviation of 0.698. This shows that moderately perceptions towards departments generally have access to inventory information, although there may still be some gaps in accessibility across departments.

Table 4.5 **item 5** shows that the statement of Common Computerized data base system available has a mean score of 4.13 and standard deviation of 0.371. This implies that positive perceptions that a common computerized database system exists within the hospitality. The low standard deviation shows consistency in respondents' opinions. This result shows that the hospitality has established integrated database systems that support information sharing and operational efficiency.

Overall, the grand mean value of 3.924 indicates that respondents generally agreed with the statements related to information integration. This suggests that the organization has relatively strong information integration practices, particularly in the use of IT tools, departmental information exchange, and computerized database systems. The grand standard deviation of 0.665 indicates relatively low variation in responses, showing consistency in respondents' perceptions regarding information integration practices within the organization.

Therefore, the grand mean value of 3.924 shows that respondents generally agreed with the informational integration statements. This shows that the hospitality has relatively strong information integration practices, particularly in the use of IT tools, departmental information exchange and computerized database systems. The grand SD of 0.665 shows that relatively low

variation in responses, showing consistency in dependents perceptions regarding informational integration practices with the hospitality.

4.3.2 Resource sharing

The second variables of internal organizational integrations in this study is resource sharing. This dimension focuses on the extent to which departments collaborate, share organizational resource and coordinate operational activities within Black Lion hospital. The response collected from participants was analyzed descriptively as presented in below.

Table 4.9 Resource sharing

Item	Statement	N	Mean	SD
1	Employees regularly interact with each other through such means as meetings, email	85	3.86	.413
2	The activities in various departments are coordinated centrally	85	3.94	.322
3	The resources required in task execution are shared among the different departments	85	3.98	.217
4	There is an essence of collaboration between different departments and employees in the organization	85	4.00	.309
5	There is use of cross functional teams in demand forecasting	85	3.25	.510
	Grand mean	85	3.806	0.354

Source (Own Survey, 2026)

As depicted in Table 4.9, item 1 shows that the statement "Employees regularly interact with each other through such means as meetings and email" achieved a mean score of 3.86 with a standard deviation of 0.413. This indicates that respondents had a positive perception regarding communication and interaction through formal communication channels within the hospital. This implies that employees frequently exchange information and coordinate activities through established communication mechanisms, which can enhance teamwork and information flow. This finding is consistent with Flynn et al. (2010), who found that effective internal communication improves coordination and contributes positively to supply chain performance.

Table 4.9 item 2 reveals that the statement "Activities in various departments are coordinated centrally" obtained a mean score of 3.94 with a standard deviation of 0.322. This indicates that respondents agreed that organizational activities are centrally coordinated. This implies that the hospital has mechanisms that facilitate coordination among departments, helping to reduce operational conflicts and improve efficiency. This finding is supported by Huo et al. (2014), who reported that effective coordination among organizational units enhances operational performance and supply chain effectiveness.

Item 3 shows that the statement "Resources required in task execution are shared among different departments" obtained a mean score of 3.98 and a standard deviation of 0.217. This indicates that respondents agreed that resource sharing exists among departments. This implies that departments cooperate in utilizing available resources, which may improve organizational efficiency and reduce resource duplication. This finding agrees with Prajogo and Olhager (2012), who concluded that resource sharing and internal collaboration positively influence organizational and supply chain performance.

As depicted in Table 4.9, item 4 shows that the statement "There is an essence of collaboration between different departments and employees in the organization" recorded the highest mean score of 4.00 with a standard deviation of 0.309. This indicates that respondents strongly agreed that collaboration exists among employees and departments. This implies that a collaborative working environment has been established within the hospital, which may contribute to better service delivery and operational effectiveness. This finding is consistent with the study by Chen et al. (2017), which found that interdepartmental collaboration significantly improves organizational performance and service quality.

Item 5 shows that the statement "There is use of cross-functional teams in demand forecasting" obtained the lowest mean score of 3.25 with a standard deviation of 0.510. Although respondents moderately agreed with the statement, the result suggests that cross-functional teams are less frequently utilized in forecasting activities compared to other coordination practices. This implies that forecasting decisions may not fully benefit from the collective expertise of different departments, potentially limiting forecasting accuracy and coordination effectiveness. This finding is similar to the findings of Sanders (2016), who reported that organizations often face

challenges in implementing cross-functional forecasting teams despite their importance for supply chain planning.

The overall grand mean of 3.806 with a standard deviation of 0.354 indicates that respondents generally agreed that effective coordination, collaboration, and resource sharing exist among departments within the hospital. This implies that coordination and resource-sharing practices are relatively well established and may contribute positively to pharmaceutical supply chain performance. This finding supports the study of Flynn et al. (2010), which concluded that higher levels of internal integration and coordination are associated with improved supply chain performance.

4.3.3 Organizational relationship linkage

The third variables of internal organizational integration considered in the study is organizational relationship linkage. This dimension has to assess the level of departmental linkage, harmonization of objectives, communication effectiveness, and integration of organizational systems within Black Lion Hospital. The collected responses was analyzed descriptively and presented in below table.

Table 4.10 Organizational relationship linkage

Item	Statement	N	Mean	SD
1	Information systems in different departments are connected in to a single department	85	3.92	.317
2	Departmental plans and objectives are set jointly	85	4.01	.327
3	The pursuit of various departmental objectives is harmonized	85	3.89	.310
4	Linkages have been established across various departments with the use of integration tools such as ERP systems	85	3.82	.560
5	There is effective communication and coordination among different departments in managing inventory information.	85	3.95	.263
	Grand mean	85	3.918	0.3554

Source (Own Survey, 2026)

As depicted in the above Table 4.10. **Item 1** shows that the information systems in different departments are connected in to a single department a mean value of 3.92 and SD of 0.317. This shows that respondents agreed that departmental information systems are integrated, which may facilitate information flow and operational efficiency.

Table 4.10, item 2 implies that the statement of departmental plans and objectives are set jointly the highest mean score of 4.01 and SD OF 0.327. This shows that respondents strongly agreed that departments collaboratively formulate plans and objectives, which may improve coordination and organizational unity.

Above table 4.10, item 3 shows that the pursuit of various departmental objectives is harmonized obtained the mean score of 3.89 and SD OF 0.310. This shows that respondents agreed that departments work in harmony toward achieving organizational goal and objectives.

Item 4 shows that the linkages have been established across various departments with the use of integration tools such as ERP systems, the mean score of 3.82 with standard deviation of 0.560. This shows that respondents agreed with statement the relatively higher standard deviation in respondents' opinions regarding the effectiveness of integration tools across departments.

Item 5 shows that effective communication and coordination among different departments in managing inventory information the score a mean score of 3.95 with SD of 0.263. This shows that respondents agreed that communication and coordination among departments are effective in inventory information management.

The overall grand mean is 3.918 with a standard deviation of 0.3554. This shows that respondents agreed that strong organizational relationship linkage among respondents had consistent opinions regarding the statements.

4.3.4 Supply chain Performance

This section presents the descriptive analysis of pharmaceutical supply chain performance at Black Lion Hospital. The data analysis focuses on organizational responsiveness, order fulfillment lead time, logistics cost reduction, service quality and customer service performance

the mean score and standard deviations was used to analyze respondents' perceptions regarding the organization supply chain performance.

Table 4.11 Supply chain Performance

Item	Statement	N	Mean	SD
1	The organization can quickly adjust and refill unexpected (emergency) need from customers	85	3.44	.680
2	The lead time for fulfilling customers‟ orders (the time which elapses between the receipt of customer's order and the delivery of the goods) is short.	85	3.22	.679
3	The organization reduces logistics cost	85	3.76	.610
4	The organization provide better quality of service	85	3.66	.628
5	The organization provides a high level of customer service	85	3.66	.547
	Grand mean	85	3.55	0.6292

Source (Own Survey, 2026)

As depicted in the above Table 4.11 **Item 1** shows that the organization can quickly adjust and refill unexpected (emergency) need from customers a mean value of 3.44 and SD of 0.6880. This shows that respondents moderately agreed that the organization is capable of responding to emergency customer demands and adjusting supply activates accordingly.

Item 2 implies that the statement of lead time for fulfilling customers‟ orders (the time which elapses between the receipt of customer's order and the delivery of the goods) is short obtained the mean value of 3.22 and SD of 0.6880. This indicates that respondents were less satisfied with the speed of order fulfillment compared to other aspects of supply chain performance.

Item 3 shows that the organization reduces logistics cost to achieved the highest means value of 3.76 with a SD of 0.610. This shows that respondents agreed that the organization effectively manages and minimizes logistics related costs.

Item 4 shows that statement of the organization provides better quality of service the mean score of 3.66 with a standard deviation of 0.268. This shows that respondents agreed that the organization delivery quality services to customers

Item 5 reveals that organization provides a high level of customer service to obtained a mean score of 3.66 with a standard deviation of 0.547. This shows that respondents perceived the organization as providing satisfactory customer service performance.

4.4 Result of Inferential Statistics

Here are the findings from the Inferential Statistics investigation run in SPSS 27. To meet the purpose of this earlier indicated investigation, person product moment correlation, coefficient and multiple regression analysis were calculated. These statistical instruments drew the following conclusion.

4.4.1 Correlations Analysis

The Pearson correlation analysis is an examination to understand if the independent variables in this analysis of the Pharmaceutical Supply Chain's Performance (dependent variable) are significantly correlated to the independent variables of Internal Integration: Information Integration, Coordination and Resource Sharing (CRS), and the Organizational Relationship Linkage (ORL). One tailed persons correlation analysis was used to investigate the link between the influences of internal integration on supply chain performance. The interval of correlation coefficient score that are possible is -1 to +1. A correlations value with a - sign suggested a negative relationship; one without a positive sign shows a good one. Cohen (1988) categorizes the degree of interactions based on the table below.

Table 4.12 Classifications of the strength of relationships

Correlation strength	Positive values	Negative values
Small	r= 0.10 to 0.29	r= -0.10 to -0.29
Medium	r= 0.30 to 0.49	r= -0.30 to -0.49
Large	r=0.50 to 1.0	r=-0.50 to -1.0

Source: Cohen (1988)

Table 4.13 Correlations

		SCP	II	CRS	ORL
Pearson Correlation	SCP	1.000	.155	.463	.698
	II	.155	1.000	.378	.031
	CRS	.463	.378	1.000	.514
	ORL	.698	.031	.514	1.000
Sig. (1-tailed)	SCP	.	.079	.000	.000
	II	.079	.	.000	.389
	CRS	.000	.000	.	.000
	ORL	.000	.389	.000	.

a. Dependent Variable: Supply chain Performance

b. All requested variables entered.

Above table 4.13 correlation analysis were employed to examine the relationship between the independent variables and dependent variables. Personal correlation coefficient was used to determine the strength and direction of the relationships among the variables. According to Cohrn (1988), correlation coefficients between 0.10-0.29 shows that a small relationship, 0.30-0.49 reveals a medium relationship and 0.50-1.00 implies a large relationship.

Informational Integration and Supply Chain Performance

The correlation result reveals that informational integration has positive relationship with supply chain performance with a correlation coefficient of r= 0.155 and p=0.079. According to Cohrn (1988), this shows that a small positive relationships. The p-value is greater than 0.05, the relationships is statistically insignificant. This shows that informational integration has only a weak contribution to supply chain performance in the hospital.

Resource Sharing and Supply Chain Performance

The correlation result implies that coordination and resource sharing has positive relationship with supply chain performance with a correlation coefficient of r= 0.463 and p=0.000.This reveal that a medium positive relationship according to Cohrn (1988), classification. Since the p-value is less than 0.01, the relationship is statistically significant. This shows that effective coordination and sharing of organizational resources positively contributed to improving supply chain performance.

Organizational Relationship Linkages and Supply Chain Performance

The correlation result implies that organizational relationship linkage has positive and strong relationship with supply chain performance. The correlation coefficient were r= 0.698 with p= 0.000. This shows that a large positive relationship according to Cohrn (1988). The relationship is statistically significant, shows that strong organizational linkages, harmonized departmental objectives, integrated systems and effective communication among departments greatly improve supply chain performance

Correlation to independent variables

The analysis implies that positive relationship among the independent variables themselves. Informational integration and coordination and resource sharing implies a medium positive relationship with r= 0.378 and p= =0.000. These results is statistically significant, shows that better information integration improve coordination and resource sharing within the hospitality.

Coordination and resource sharing and organizational Relationship linkage also reveals a strong positive relationship with r= 0.514 and p= 0.000, this shows a large positive and statistically significant relationship, supports that effective coordination and sharing of resource improve organizational linkages among departments.

Finlay, the information integration and organizational relationship linkage implies that very weak positive relationship with r= 0.031 and p=0.389. The p- value is greater than 0.05, the relationship is statistically insignificant.

Overall, the findings show that all independent variables have positive relationship with supply chain performance. Among the variables such as organization relationship linkage has the strongest relationship with supply chain performances, follow coordination and resource sharing. However, information integration showed only a weak and statistically insignificantly relationship with supply chain performance. Correlation analysis is relevant to all three research questions.

1. What is the effect of information integration on supply chain performance at black lion hospital?
2. What is the effect of coordination and resource sharing on supply chain performance at black lion hospital?
3. What is the effect of organizational relationship linkage on supply chain performance at black lion hospital?

After establishing these relationships through correlation, multiple regression analysis is then used to determine the magnitude and significance of the effect of the independent variables on supply chain performance. On the whole all three research questions require correlation analysis because each seeks to examine the relationship between an internal integration dimension and pharmaceutical supply chain performance.

4.5 Multiple Linear Regressions Analysis

The purpose of this study was to determine the degree of influence by internal integration (i.e., information integration, coordination & resource sharing, and organizational relationship linking) on pharmaceutical supply chain performance. Using a multiple regression analysis, we assessed the individual and collective impact of each of these internal integration dimensions on pharmaceutical supply chain performance.

The results of the regression analysis revealed that all three dimensions of internal integration (i.e., information integration, coordination & resource sharing, and organizational relationship linking) have significant influence on pharmaceutical supply chain performance. In particular, effective information sharing and coordination between departments are critical variables in improving both operational efficiency and delivery of healthcare services.

The results of this study indicate that organizations with strong internal integration systems have greater ability to improve inventory control, reduce operational delays, enhance communication and improve availability of medicines. Therefore, increasing collaboration and internal integration among organizational units will enhance overall pharmaceutical supply chain performance at Black Lion Hospital.

4.5.1 Assumption Tests

Julie (2005) suggests that before conducting a multiple regression analysis, the researcher should verify these assumptions: sample size, outliers, normality, linearity, multicollinearity, and singularity. If these assumptions are met, then the analysis can proceed. The researcher then moves on to the regression analysis.

4.5.2 Multicollinearity Test

Multi collinearity is refers to the relationship among the independent variables. Multicollinearity exists when the independent variables are highly correlated (r=.9 and above) (Julie, 2005).

Table 4.14 Multicollinearity test

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Information integration	.821	1.218
	Coordination and resource sharing	.605	1.654
	Organizational relationship linkage	.705	1.419

a. Dependent Variable: Supply chain Performance

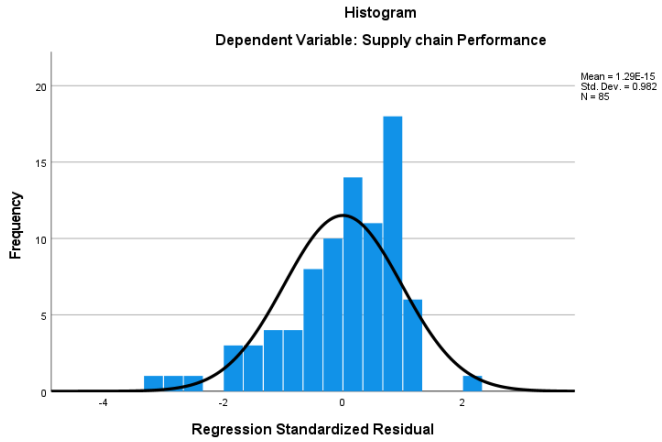
Two things should be examined from the coefficient table, tolerance and VIF, to determine the multicollinearity impact, as per Julie (2005). A very low tolerance value (less than 0.10) shows a strong multiple correlations with other variables, which points to potential multicollinearity. The VIF (Variance inflation factor) is the second value provided; it is simply the reciprocal of the Tolerance value (1 divided by Tolerance). If VIF values indicate more than 10, then it would

indicate multicollinearity. The VIF is not greater than 10, and the tolerance is not less than 0.1. It suggests that the investigation does not break the assumption since there is no multicollinearity among the predictor factors.

4.5.3 Test of Normality

The score distribution of the dependent variable ought to be normal, which is a symmetric, bell-shaped curve with the greatest frequency of scores about the mean and lower frequencies at the extremes. The visual histogram for this study indicates that the data used is normally distributed, thereby meeting the assumption.

Figure 4.3 Normality of ball shape



4.5.4 Test of linearity

Linearity assumption of multiple regressions was tested using scatter plot test (Kothari, 2004) .It was found that there is linear relationship between independent and dependent variables. According to the linearity result, the distributions of residuals are near to the mean zero.

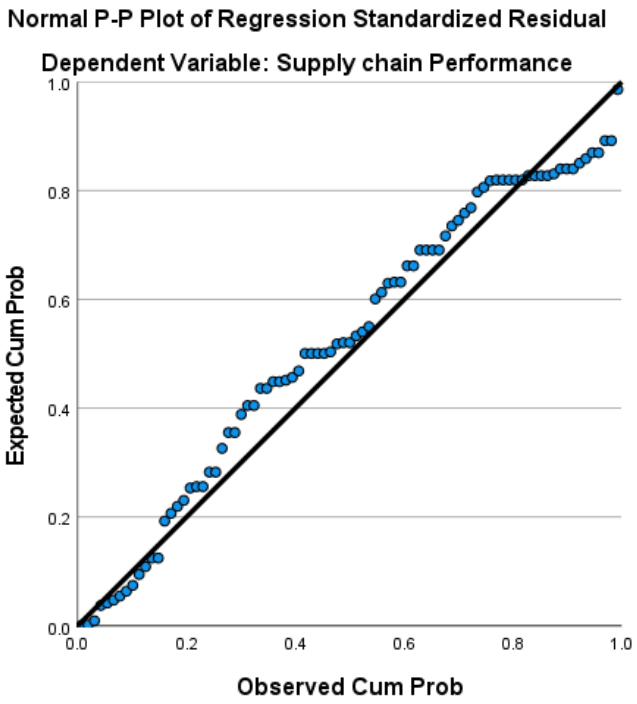


Figure 4.4 Normal p-p plot

4.5.5 Auto-correlation Test

The Durbin-Watson statistic value is 2.150. The Durbin-Watson test is used to detect the presence of autocorrelation in the residuals of the regression model. A value close to 2 indicates no autocorrelation problem, while values substantially below or above 2 indicate positive or negative autocorrelation respectively. In this study, the Durbin-Watson value of 2.150 is very close to 2, which suggests that there is no serious autocorrelation problem in the regression residuals. Therefore, the assumption of independence of errors is satisfied, and the regression model is appropriate for the study.

4.6 Multiple Regression Analysis

4.6.1 Model summary

Table 4.15 Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.714[a]	.510	.492	1.73300	2.150

a. Predictors: (Constant), Organizational relationship linkage, Information integration, Coordination and resource sharing

b. Dependent Variable: Supply chain Performance

Above table 4.15 depict the model summary of the multiple regression analysis conducted to examine the effect of informational integration, coordination and resource sharing and organizational relationship linage on supply chain performance.

Above model summary tables reveals that the value of R is 0.714. The multiple correlation coefficient (R) implies that the overall relationship between the independent variables and the dependent variables. An R value of 0.714 shows that a strong relationship between the combined independent variables and supply chain performance. This reveals that informational integration, coordination and resource sharing and organizational relationship linkage are strongly associated with supply chain performance in the hospitality.

The R value is 0.510. This shows that 51.0% of the variation in supply chain performance is explained by the combined effect the independent variables included in the regression model, into informational integration, coordination and resource sharing and organizational relationship linage. The remaining 49.0% of the variation in supply chain performance is explained by other factors that were not included in the study.

The adjusted R square value is 0.492. Adjusted R square is used to measure the explanatory power of the regression model after adjusting for the number of independent variables included in the model. The adjusted value indicated the approximately 49.2% of the variation in supply chain performance is explained by the independent variables independent variables after considering the effect of sample size and number of predictors. The moderately reductions from the R square (0.510) to Adjusted R square (0.492) implies that the independent variables included the model does not certain unnecessarily variables. The standard errors of the estimate are 1.73300. This value measure the moderate deviation of the observed value from the

regression line a lower standard errors indicates that the observed values are closer to the predicted value generated by the regression model.

4.6.2 ANOVA

Table 4.16 ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	253.039	3	84.346	28.085	.000[b]
	Residual	243.266	81	3.003		
	Total	496.306	84			

a. Dependent Variable: Supply chain Performance

b. Predictors: (Constant), Organizational relationship linkage, Information integration, Coordination and resource sharing

ANOVA result shows overall goodness of fit of the model. As shown in table 4.16, F-value is 28.085 with a P-value of 0 .000. As the P- value of ANOVA is less than the significance level which is 0.05, it means all independent variable (internal integration) have significant effect on dependent variable (pharmacy supply chain performance). Overall the model is significant to carry out regression analysis

4.6.3. Regression Coefficients Analysis

After identifying the importance and overall significance/ fit of the model to predict the pharmaceutical supply chain performance of Black lion Hospital (the dependent variable), the next step is to assess each predictor's role in influencing the variability of the dependent variable to understand the importance of the variables; and their statistician and practical significances. This information is located in the Regression Coefficients output box shown in the Table below.

Table 4.17 **Regression Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-13.145	3.955		-3.324	.001

	Information integration	.140	.121	.099	1.158	.250
	Coordination and resource sharing	.226	.243	.093	.929	.355
	Organizational relationship linkage	1.216	.174	.647	6.982	.000

Above table 4.17 depicts the regression coefficients show that the effect of informational integration, coordination and resource sharing an organizational relationships linkage on supply chain performance

Above table reveals that the organizational relationships linkage is the only statistically significant predictor of supply chain performance. It is p-value is less than 0.05. Specifically, organizational relationships linkage has a coefficient value of 1.216 with p=0.000, which shows that a one unit increase in organizational relationships linkage leads to a 1.216 increase in supply chain performance the other variables are kept constant. This implies that effective communication, harmonized departmental objectives, integrated systems and strong interdepartmental relationships positively contribute to supply chain performance.

The informational integration has a positive coefficient value of 0.140 with p=0.250. While the relationship is positive, the variables is sadistically insignificant because the p-value is greater than 0.05. This shows that informational integration does not have a significant effect on supply chain performance in the regression model. The result shows that access to information systems and computerized database alone may to be sufficient to significantly enhance supply chain performance unless supported by other organizational practice.

Coordination and resource sharing had a positive coefficient vale of 0.226 with p= 0.355. The relationship is positive, the variables is statistically insignificant because the p-value exceeds 0.05. This shows that coordination and resource sharing don’t significant predict supply chi performance model The result may imply that coordination activates and resource sharing practices are not et strong enough to create a substantia impact on supply chain performance.

The regression model can therefore be expressed as:

$SCP = -13.145 + 0.140(II) + 0.226(CRS) + 1.216(ORL) + \varepsilon$

Where:

SCP= Supply Chain Performance

II= Information integration

CRS = Coordination and resource sharing

ORL= Organizational relationship linkage

ε = Error term

Concluded, the regression models a one unit increase in each independent variables changes supply chain performance by its respective coefficient while keeping the other variables constant.

Information Integration: Therefore, information integration cannot independently predict supply chain performance at black lion hospital. One possible explanation is that while the hospital has information-sharing mechanisms, IT tools, and computerized data bases, these systems may not be fully integrated across all departments or may not be effectively utilized for operational decision-making. As a result, the available information may not sufficiently support forecasting, inventory control, and coordination activities necessary to improve supply chain performance. As a result of, Hypothesis one (H1) is rejected.

Coordination and resource sharing: The finding suggests that existing coordination mechanisms and resource sharing practices may not be sufficiently institutionalized or consistently implemented across departments. In addition, the relatively low use of cross-functional teams for demand forecasting and planning may limit the effectiveness of interdepartmental collaboration. Therefore, despite the presence of coordination and resource sharing activities, their impact on pharmaceutical supply chain performance remains in adequate to produce a significant effect. Consequently, Hypothesis Two (H2) is rejected.

In generally information integration positive but insignificant because information systems exists, yet they are not fully integrated & effectively used for supply chain decisions. Coordination & resource sharing positive but insignificant because coordination practices are not

consistently applies across departments and cross-functional collaboration is limited. These justification align with regression results (β=0.140, P=0.250, β=0.226, P=0.355) and support the rejection of H1 & H2.

4.7 Hypothesis Testing

The study tested the hypothesis result to examine the effect of internal integration, on pharmaceutical supply chain performance. The hypotheses was tested multiple regression analysis based on the significance level (p=value) of each independent variables. The hypothesis was accepted when the p-value was less than 0.05 and rejected when the p-value was greater than 0.05.

H1: Information Integration has a Significant Positive Effect on Pharmaceutical Supply Chain Performance

The results of the regression analysis indicate that the beta coefficient for information integration is β = 0.140 with a p-value of 0.250. The p-value of 0.250 is greater than the significance level of 0.05; therefore, we can conclude that the effect of information integration on performance in the pharmaceutical supply chain (H1) is not statistically significant; therefore, H1 is rejected.

The regression coefficient is a positive number which indicates that when there is an increase in the level of information integration there is a tendency for there to be a positive increase in performance of the supply chain; however, due to the statistical insignificance of this relationship, the theoretical and empirical relationship between the level of information integration and performance of the supply chain (Flynn et al., 2010, Zhao et al., 2011) are contradicted by the results of my study. There are numerous plausible explanations for the statistical insignificance of the relationship between the level of information integration and performance of the pharmaceutical supply chain such as: the fact that although hospitals have information systems and information-sharing mechanisms there may not be a complete level of integration between the various departments in the hospital or that the information may not utilized appropriately to make operational decisions; or that there is uneven access to the information so that there is a diminished effect of the level of information integration upon the

performance of the pharmaceutical supply chain. As such, it is plausible that there was insufficient integration of information to provide a statistically significant change in performance of the pharmaceutical supply chain.

H2: Coordination and Resource Sharing have a Significant Positive Effect on Pharmaceutical Supply Chain Performance

According to the regression analysis, coordination and resource sharing have a $\beta = 0.226$ and $p = 0.355$ indicating that there is no statistically significant relationship. Thus, Hypothesis 2, hypothesizing that coordination, and resource sharing have a significant positive impact on pharmaceutical supply chain performance, is rejected.

Despite a positive beta coefficient, the data implies that improved coordination, and resource sharing do not have a statistically significant impact on supply chain performance. This result is contrary to earlier studies that reported coordination and resource sharing to be strong drivers of supply chain performance (Prajogo & Olhager, 2012; Huo et al., 2014). One possible explanation is that coordination and resource sharing practices in the hospital do not appear to be sufficiently institutionalized or consistently implemented throughout the various departments. Low use of cross-functional teams for forecasting and planning activities may hinder the overall effectiveness of the various coordination mechanisms. Hence, while there does appear to be coordination and resource sharing in place, there does not seem to be sufficient positive impact on pharmaceutical supply chain performance through these methods within the hospital.

H3: Organizational relationship linkage has a significant positive effect on supply chain performance

The regression analysis shows that Organizational relationship linkage has a beta coefficient value of $\beta = 1.216$ with $p=0.000$.since the p-value is less than 0.05 the hypothesis is accepted. This shows that organizational relationship linkage has a statically significant positive effect on supply chain performance. The result shows that Organizational relationship linkage is the strongest predictor of supply chain performance at the variables included in the study.

Table 4.18 Summary of hypothesis testing

Hypothesis	Variable	Beta (β)	P-value	Decision

H1	Informational integration	0.140	0.250	Rejected
H2	Coordination and resource sharing	0.226	0.355	Rejected
H3	Organizational relationship linkage	0.216	0.000	Accepted

4.8 Discussion

4.8.1 Discussion of Hypothesis One

H1: Information Integration has a significant positive effect on pharmaceutical supply chain performance.

The results from the regression analysis demonstrated a positive but insignificant relationship between information integration ($\beta = 0.140$, $p = 0.250$) and supply chain performance. Thus, H1 was not confirmed. Although the results imply that information integration has a positive influence on supply chain performance in the pharmaceutical industry, it does not have a statistically significant influence on that outcome.

This result runs counter to the theoretical basis for making information available and sharing information through integrated systems in order to improve supply chain performance through greater coordination, improved visibility of inventory, and improved decision-making (Flynn et al., 2010; Zhao et al., 2011). Additionally, it is incongruent with prior studies that found that information integration was a significant predictor of supply chain performance. One possible explanation for this discrepancy between the findings is that while there are mechanisms in place to share information and technology-based systems in place to facilitate communication between various departments/disciplines within a hospital, they may have yet to achieve a degree of integration across all areas of activity. Furthermore, there may be inconsistency in how the information is used when it comes to operational planning and making decisions. As such, the current level of information integration might not be sufficient to exert meaningful influence over supply chain performance for pharmaceuticals.

4.8.2 Discussion of Hypothesis Two

H2: Coordination and Resource Sharing have a significant positive effect on pharmaceutical supply chain performance.

The Coordination and resource-sharing were shown to have a positive beta coefficient (β = 0.226) from the regression analysis; however, the p-value was insignificant (p = 0.355). Thus, the null hypothesis was rejected.

Although the positive beta coefficient indicates that coordination and resource-sharing are a contributor to the performance of the supply chain, their contribution was not statistically significant. This finding is contrary to previous research that has shown that coordination and resource-sharing have a significant positive relationship to the performance of a supply chain (Prajogo & Olhager, 2012; Huo et al., 2014).

One reason for the lack of statistical significance could be that the coordination and resource-sharing practices within the hospital may not be consistently applied throughout the functional departments. In addition, a descriptive analysis indicated that cross-functional teamwork is practiced at a relatively low level when completing forecasting and planning activities. Therefore, while there are existing mechanisms for coordination, these mechanisms may not be strong enough to create a significant effect on the overall performance of the pharmaceutical supply chain.

4.8.3 Discussion of Hypothesis Three

H3: Organizational Relationship Linkage had a significant positive effect on pharmaceutical supply chain performance.

The regression result reveal that coordination and resource had the strongest and significantly positive and statistically significant effect on pharmaceutical supply chain performance (β = 1.216, p = 0.000). Thus, the hypothesis was accepted.

The results demonstrate that strong organizational relationships between departments, good communication practices, jointly established objectives, and collaborative work environments all contribute to enhancing pharmaceutical supply chain performance. Therefore, this result supports the theoretical proposition that organizational relationship linkages contribute to greater internal integration and increased operational efficiencies.

The findings support those reported by Flynn et al. (2010), who indicated that greater levels of inter-departmental relationships increased coordination and overall supply chain effectiveness; likewise, Chen et al. (2017) found that improved collaboration/communication between

organizational units directly impacted overall organizational performance. As such, the organizational relationship linkages were identified as being the most influential factor affecting the pharmaceutical supply chain performance at Tikur Anbessa Specialized Hospital.

Generally, the evidence indicates that while each of the dimensions of internal organizational integration has a positive relationship with pharmaceutical supply chain performance, the strongest dimension was identified as being organizational relationship linkage. Although there were statistically significant evidence of a positive impact of both information integration and coordination/resource sharing; these dimensions were not statistically significant relative to the other dimensions previously mentioned.

CHAPTER: FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapters presented the summary of findings, conclusion drawn from the study and recommendation based on the findings and conclusion.

5.1 Summary of major Findings

The general objectives of this study were examined the effect of internal organizational integration on pharmaceutical supply chain performance at Black Lion Specialized Hospital. Moreover, the study investigated the effects of informational integration, coordination and resource sharing, and organizational relationship linkage on pharmaceutical supply chain performance.

H1: Information Integration had significant positive effect on pharmaceutical supply chain performance.

The descriptive analysis indicated that information integration was generally practiced within the hospital, with an overall mean value implies respondent's agreement regarding information sharing activities. The correlation analysis implies a positive but weak relationship between information integration and pharmaceutical supply chain performance ($r = 0.155$, $p = 0.079$). Moreover, the regression analysis implies that information integration have a positive but statistically insignificant effect on pharmaceutical supply chain performance ($\beta = 0.140$, $p = 0.250$). Thus, H1 was rejected. The result implies that although information integration exists within the hospital its supported to increase pharmaceutical supply chain performance was not statistically significant.

H2: Coordination and Resource Sharing had a Significant positive effect on pharmaceutical supply chain performance.

The descriptive result implies that respondents generally agreed that coordination, collaboration and resource sharing practices existed among departments. The correlation analysis implies a moderate perceptions and pharmaceutical supply chain performance ($r = 0.463$, $p < 0.001$). Moreover, the regression analysis implies that coordination and resource sharing had a positive but statically insignificant effect on pharmaceutical supply chain performance ($\beta = 0.226$, $p = 0.355$). Thus, H2 was rejected. The result shows that although coordination and resource sharing practices contributed positively to supply chain activities, their independent contribution was not statistically significant when analyzed together when other variables of internal integration.

H3: Organizational Relationship Linkage has a significant positive effect on pharmaceutical supply chain performance.

The descriptive result implies that respondents generally perceived collaboration and communication among departments. The correlation analysis implies a strong positive and statically significant relationship between organizational linkage and pharmaceutical supply chain performance ($r = 0.698$, $p < 0.001$). The regression analysis implies that organizational linkage had a positive and statistically significant effect on pharmaceutical supply chain performance. Thus, H3 was accepted. The result indicates that effective communication, collaboration, trust and strong interdepartmental relationships play a significant role in improving pharmaceutical supply chain performance at Black Lion Specialized Hospital.

Generally, the study reveals that organizational relationship linkage was the most influential variables of internal organizational integration affecting pharmaceutical supply chain performance. While information integration and coordination and resource sharing exhibited positive relationship with pharmaceutical supply chain performance, their effects were not statistically significant in the regression model.

5.2 Conclusion

Based on the findings of the study, it can be concluded that internal organizational integration revels an important role in improving pharmaceutical supply chain performance at Black Lion

Hospital. The study reveals that the hospital has relatively good practice regarding information sharing, departmental collaboration, centralized coordination and organizational linkage.

This study concluded that organizational relationship linkage is the most important factors influencing pharmaceutical supply chain performances. Effective organizational linkage among departments improve operational coordination, harmonizes departmental objectives, strengthens organizational relationship and enhance overall supply chain efficiency. Strongly organizational integration enables departments to work collaboratively towards achieving organizational goals and improving pharmaceutical supply chain responsiveness.

The study concluded that Organizational Relationships Linkage is the strongest determinant of pharmaceutical supply chain performance at Black Lion Hospital. Information Integration and Coordination and Resource sharing implies positive but statistically insignificant effects. This implies that the current implementation of information systems and coordination mechanisms may not yet be sufficiently effective to create a strong effect on operational performance.

The study concluded that black lion hospital demonstrates uncertainty pharmaceutical supply chain performance, particularly in logistic cost reduction, emergency responsiveness and customer service delivery. Whenever, operational challenges such as late in order fulfillment and limited use of cross functional forecasting practices still effects of supply chain efficiency and responsiveness.

Overall, the study concluded that strengthening organizational relationship linkage and improving collaborative operational practices among departments are essential for improving pharmaceutical supply chain performance at Hospital.

5.3 Recommendations

Based on the findings and conclusion of the study the following recommendations:

Hospital management should strengthen organizational relationship linkage among departments by improving collaborative planning, harmonized departmental objectives and integrated operational systems. Regularly interdepartmental meetings, shared decision making mechanisms

and coordinated planning activates should be support to improve pharmaceutical supply chain efficiency and responsiveness.

Black Lion Hospital enhance the effectiveness of information integration systems by ensuring that all departments have equal and timely access to pharmaceutical inventory and operational information and management should strengthen integrated information systems and provide continuous technical support to employees to improve utilization of informational technology tools in operational decision making.

The hospital should improve resource planning sharing practices in departments through stronger collaboration mechanisms and cross functional teamwork. The use of cross functional teams in demand forecasting, procurement planning and inventory management activities should be to enhance planning accuracy and operational coordination.

Black Lion Hospital should be focus on reducing order fulfillment lead time by improving inventory management practice, strong suppler coordination and enhance internal operational processes. Efficient replenishment mechanisms and emergency response systems should also be developed to improve customer satisfaction and pharmaceutical availability.

The hospital should provide continuous training and capacity building programs for employees involved in pharmaceutical supply chain activities and training program related to supply chain integration, inventory management, ERP systems and collaborative operational practices should be help to improve employee competency and organizational performances.

Management should continuously monitor and evaluate internal integration practices to identify operational gaps and areas requiring improvement. Regular performance evaluation and feedback mechanisms should be implemented to support continuous improvement in pharmaceutical supply chain performance.

5.4 Suggestions for future researcher

Future researchers suggested to conduct similar studies in other public and private healthcare are institutions to compare the effect of internal organizational integration on pharmaceutical supply chain performance across different hospitality.

Future studies should also include additional variables such as supplier integration, customer integration, organizational culture and employee competency to enhance the explanatory power of the regression model.

Future researchers suggested may too conducted longitudinal studies to examine the long-term effect of internal organizational integration oh pharmaceutical supply chain performance over time. Such studies may provide broader understanding regarding the suitability and effectiveness of integration practices in healthcare supply chain management.

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APPENDIXES

ADDIS ABABA UNIVERSITY
SCHOOL OF POST GRADUATE STUDIES
DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

(Questionnaire for employees of Black Lion Hospital)

Dear Respondents

My name is Abeba Gezahegn conducting a study on the effect of internal integration on supply chain performance at Black Lion Hospital for the partial fulfillment of master's degree in logistics and supply chain management at Addis Ababa University, School of commerce. I would like to extend my deep appreciation to your agency and you for the willingness and cooperation in undertaking this valuable research. Taking part in this study you will contribute towards alleviating the problems of internal integration in your organization. I request your cooperation to fill and respond truthfully for the asked Questions. I would like to reassure you that this is strictly confidential and won"t be shared to anyone about your responses; no personal identifier will also be attached to the questions. It will be only the researcher who will be looking the data. Please also make sure that you are not forced to reply any of the questions that you are not comfortable with. However, I encourage you to provide your best of knowledge on the questions so that the study will be useful.

N.B

No need of writing your name.

Please put √ mark for the answer in the given space.

Section A: Demographic Information

1 Gender: Male [ ] Female [ ]

2 Highest level of education. Please tick (√)

Master's Degree [ ] Diploma [ ] First Degree (Bachelors) [ ] Certificate [ ]

Other …….

3 Age:

Less than 25 Years [ ] 26-34 Years [ ] 35-44 Years[ ] 45-54 Years [ ] Above 54 Years [ ]

4 Work Experience:

Less than 25 Years [ ] 2-5 years [ ] 6-10 years [ ] more than 10 years [ ]

5 Please indicate your current positions

Store Manager [ ] warehouses assistant [ ] procurement officer [ ] Oxygen supply chain management [ ] Pharmacy [ ]

others …….

6 How many years have you been employed in Black Lion Hospital

1-5 Years [ ] 11-15 Years [ ] 6-10 Years [ ] Over 15 Years[ ]

Section II: Questions related to specific objectives

Please give your opinion by rating as; 5 strongly agree (SA) 4 agree (A) 3 neutral (N) 2 disagree (D) 1 strongly disagree (SD)

No		1	2	3	4	5
	Section B : Issue related to Information integration					
1	All employees are allowed to access all information they may require in execution of their tasks					
2	Employees utilize IT tools in facilitating information access					
3	Different departments engage in information exchanges					
4	All functional departments have information access to inventory level of pharmaceuticals					
5	Common Computerized data base system available					
	Section C: Issue related to Coordination and resource sharing					

1	Employees regularly interact with each other through such means as meetings, email					
2	The activities in various departments are coordinated centrally					
3	The resources required in task execution are shared among the different departments					
4	There is an essence of collaboration between different departments and employees in the organization					
5	There is use of cross functional teams in demand forecasting					
	Section D: Issue related to Organizational relationship linkage					
1	Information systems in different departments are connected in to a single department					
2	Departmental plans and objectives are set jointly					
3	The pursuit of various departmental objectives is harmonized					
4	Linkages have been established across various departments with the use of integration tools such as ERP systems					
5.	**There is effective communication and coordination among different departments in managing inventory information.**					
	Section E: Issue related to Supply chain Performance					
1	The organization can quickly adjust and refill unexpected (emergency) need from customers					
2	The lead time for fulfilling customers‟ orders (the time which elapses between the receipt of customer's order and the delivery of the goods) is short.					
3	The organization reduces logistics cost					
4	The organization provide better quality of service					
5	The organization provides a high level of customer service					

THANK YOU FOR YOUR COPERATION!!!