EFFECT OF PHARMACEUTICAL SUPPLY CHAIN INTEGRATION ON ORGANIZATIONAL PERFORMANCE: THE CASE OF DEBRE BERHAN COMPREHENSIVE SPECIALIZED HOSPITAL, AMHARA REGION NORTH SHOA ZONE

BY

ESHETU MENGISTU

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ADVISOR

YOHANIS TEFERA (Assist. Professor)

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Debre Birhan University
School of business and economics
Graduate Studies
Approved by Board of Examiners

YOHANIS TEFERA (Assist. Professor)   _____   _____

<div align="center">Advisor Name   Signature   Date</div>

_____   _____   _____

Internal examiner Name   Signature   Date

_____   _____ _____

External Examiner Name   Signature   Date

_____   _____ _____

Chairman of Graduate Committee   Signature   Date

DECLARATION

"I hereby declare that this research paper entitled "**The effect of pharmaceutical supply chain integration on organizational performance in DBCSH**" is my own and to the best of my knowledge and belief, it is free from previously published materials or written by another person, nor material which to a substantial extent that has been submitted for the award of any other degree or diploma of a university or other institution of higher learning."

Student Researcher   **Signature**   **Date**

Eshetu Mengistu   _____   _____

LETTER OF CERTEFICATION

This to certify that Eshetu Mengistu has carried out his thesis work on the topic entitled "**The effect of pharmaceutical supply chain integration on organizational performance in DBCSH**" under my guidance and supervision. Accordingly, I here assure that his work is appropriate and standard enough to be submitted for the award of Master of Arts in Logistics and Supply Chain Management.

Research Advisor	**Signature**	**Date**
YOHANIS TEFERA (Assist. Professor)	_____	_____

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List of Abbreviations and Acronyms

AIDS	Acquired Immuno Deficiency Syndrome
CSCMP	Council of Supply Chain Management Professionals
EPSA	Ethiopian Pharmaceuticals Supply Agency
HCMIS	Health Chain Management Information System
HIV	Human Immuno Virus
IPLS	Integrated Pharmaceutical Logistics System
MCH	Maternal and Child Health
NPPL	National Pharmaceutical Procurement List
PFSA	Pharmaceuticals Fund and Supply Agency
RDF	Revolving Drug Fund
RRF	Report and Requisition Form
SCM	Supply Chain Management
SOP	Standard Operating Procedure
SPSS	Statistical Package for Social Sciences
USAID	United States Aid International Development
SCI	Supply chain integration
DBCSH	Debre Birhan Comprehensive Specialized Hospital
OPD	Outpatient Department
RRF	Reporting and Requisition Form

Abstract

The aim of this thesis is to assess the effect of pharmaceutical supply chain integration on Organizational performance at DBCSH. The process of integration has many touch points with multiple functions within the organization and these functions need to be integrated in order to provide better performance to the organization and service to the customer. An explanatory research design was employed with a sample of 102employees through stratified sampling. A questionnaire was used as a research tool for collecting data. The collected data was analyzed using both descriptive statistics (mean & standard deviation) and inferential statistics (correlation and linear regression). Main findings of the study depicts that, there is poor integration along the pharmaceutical supply chain as the mean values of the four pharmaceutical supply chain dimension (internal integration, information integration, supplier integration and customer integration)were below the minimum requirement(i.e. less than the mean value of 2.5). Moreover, internal integration and customer integration dimensions of pharmaceutical supply chain integration had a significant effect on organizational performance of the DBCSH in which information integration and supplier integration dimension had failed to signify the effect and needs to include other pharmaceutical supply chain variables. Finally, the results on the conclusion entails us that the four research questions developed in this study were considerably rated low by the employees which actually indicates the pharmaceutical supply chain integration is not at the required level of its employees. Finally, the study recommends that; proper internal integration, information integration, supplier integration and customer integration in order to bring effective organizational performance.

Keywords: internal integration, information integration, supplier integration Customer integration, organizational performance, pharmaceutical supply chain integration

CHAPTER ONE

INTRODUCTION

In this chapter background of the study, back ground of the organization, statement of the problem, research questions, research objectives (general and specific), significance of the study, scope of the study, operational definition and organization of the study are included.

1.1 Background of the study

Supply chain is the network created among different companies that produce, handle, and distribute a specific product (Susarla & Karimi, 2012). Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement. It also includes coordination and collaboration with channel partners, which can be departments within the supply chain organization, suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management with in and across companies (Council of Supply Chain Management Professional, 2011).

Supply chain integration (SCI) is characterized by a situation where members along the supply chain collaborate and work together for better performance and profitability while meeting the demands of the customer. Firms integrating their information and material flow would lead to optimal management of the supply chain. It involves the alignment of business functions internally within a firm and with its supply chain partners so as to reduce costs, increase customer value and overall performance across the supply chain for all partners.

Flynn et al. (2010) stated operational performance and business performance are the two widely used measures of organizational performance. Operational performance (OP) is a major determinant to the overall organizational performance, which usually is the merged result from multiple factors and enablers in the system. Frohlich and Westbrook (2001) elaborated that organizational performance measures for a pharmaceutical supply chain should incorporate indicators in the operational dimension, such as customer satisfaction and the operational responsiveness to the changing market demand. Similarly, Lai et al. (2010) enlisted cost, time, quality, delivery and flexibility as the basic measures of organizational performance. While addressing the needs for pharmaceutical supply chains to balance their attention to the environmental concerns, Jakhar (2015) developed a green organizational performance framework.

Numerous theoretical and empirical studies have connected pharmaceutical supply chain integration to organizational and/or business performance (Vanpoucke et al. 2014). This link can be explained by the creation of relational assets (Edward 1998), which makes pharmaceutical supply chain integration difficult to imitate. In addition, pharmaceutical supply chain integration helps companies to manage pharmaceutical supply chain flows and reduce the detrimental impacts of the bullwhip effect. Smoothing and better managing these material and information flows should result in reduced costs and lead times, and improved on-time delivery and flexibility and quality (Weingarten et al. 2014).

In addition, companies with a low internal integration strategy will achieve low level of external integration and companies implementing the full internal integration strategy will have the highest levels of external integration. Generally, it is believed that firms achieve a relatively high degree of internal integration before they attempt to develop a higher degree of external integration. Internal integration can be accomplished through automation and standardization of each internal logistics function, the introduction of new technology, and continuous performance control under formalized and centralized organizational structure.

The researchers' intension is to come up with empirical evidence on the effect of pharmaceutical supply chain integration on organizational performance. In addition there is lack of studies that are conducted on organizational performance and pharmaceutical supply chain integration in Debre birhan Comprehensive Specialized hospital. The aim of this study is to fill the above listed literature gaps.

1.2. Background of the organization

Debre birhan Referral Hospital has been established in 1937 G.C by Italian Army Force. It is located in Amhara Region 130 Kilometers from Addis Ababa on the north direction. In centuries the hospital has transformed itself to Zonal hospital and in 2010 the hospital has merged as Referral Hospital. By improving its service quality and increasing the number of peoples it served the hospital again transformed in to Comprehensive Specialized Hospital at 2020.

Currently the hospital have 162 inpatient beds and serves for around 3 million people from North Shoa Zone, Oromia Nations Zone and some peoples from afar region woredas which are located at the boarder of North Shoa zone.

1.3 Statement of the problem

Supply chain integration is the degree to which a manufacturer strategically collaborates with its supply chain partners and collaboratively manages intra- and inter-organizational processes, in order to achieve effective and efficient flows of products and services, information, money and decisions, to provide maximum value to the customer (Flynn et.al, 2010). Supply chain integration is one of the key elements in improving firm performance. The key to SCI is to develop uninterrupted link with upstream suppliers and downstream customers along with total functional synergy internally. Therefore, integration could be achieved through three major interrelated activities – customer relationship management, internal SCM and supplier relationship management (Alfalfa-Luque .R, Madina-Lopez .C and Kumar dey. 2012).

There are constraints in the Pharmaceutical supply chain which critically affects operational performance of an organization such as longer lead times, supply disruptions caused by fragmentations, foreign regulations and port congestion, political and/or economic instability in a source country, and changes in economics such as exchange rates which in turn leads to increasing cost of product, reduces speed of delivery of product, reduces quality of product and flexibility of the company (Binyam 2014).

Effective and efficient supply chain integration via the organizations and across the organization has a great contribution for a better operational performance. Frohlich and Westbrook (2001); Swink et al. (2007) and Zhao et al. (2011) have been suggested that supply chain integration play different roles in operation performance improvement and capability development. So knowing the effect of pharmaceutical supply chain integration is a key factor for each company to improve their integration (ZahraLotfi, et al. 2013).

The case company, debre birhan comprehensive specialized hospital has many supply chain related performance problems which includes warehouse storage space problems, higher level of inventory for low movable items, stock outs for vital and essential pharmaceuticals, obsolescence etc. In addition different departments are concerned with achieving their own objectives separately (source, report from plan program department 2/12/2019). Such problems happened due to poor supply chain integration in general and pharmaceutical supply chain integration problems in particular. So through analyzing the effect of pharmaceutical supply chain integration, this study will help to identify improvement areas that can solve organization performance problems.

Despite the importance of pharmaceutical supply chain integration on organizational performance there is a lack of studies in health sectors like hospitals, health centers and health posts, that link pharmaceutical supply chain integration practices and organization performance. So the aim of this study is to fill these pharmaceutical supply chain integration gaps in Debre Birehan Comprehensive specialized Hospital.

1.4 Research Question
  - ➢ What is the effect of internal integration on organizational performance in Debre Birhan Hospital?
  - ➢ What is the effect of information integration on organizational performance in Debre Birhan Hospital?
  - ➢ What is the effect of customer integration on organizational performance in Debre Birhan Hospital?
  - ➢ What is the effect of supplier integration on organizational performance in Debre Birhan Hospital?
  - ➢ What is the effect of pharmaceutical supply chain integration on organizational performance in Debre Birhan Hospital?

1.5 Research Objectives

1.5.1 General objective
The general objective of this study is to assess the effect of pharmaceutical supply chain integration on organizational performance.

1.5.2 Specific objective
  - ➢ To examine the effect of internal integration on organizational performance in Debre Birhan Hospital
  - ➢ To assess the effect of information integration on organizational performance in Debre Birhan Hospital
  - ➢ To assess the effect of customer integration on organizational performance in Debre Birhan Hospital
  - ➢ To assess the effect of supplier integration on organizational performance in Debre Birhan Hospital
  - ➢ To assess the effect of pharmaceutical supply chain integration on organizational performance in Debre Birhan Comprehensive specialized Hospital

1.6 Significance of the Study

This study will help the company under consideration debre birhan comprehensive specialized hospital to look deep into their pharmaceutical supply chain relations internally with departments and externally with suppliers and customers and help the top managers to make appropriate decisions. This will enhance the performance of their respective organization based up on the analysis of the study, which will help to reduce their cost and lead time and becomes effective and more efficient in the Supply chain process. Additionally by facilitating the internal and external activities through pharmaceutical supply chain integration the hospital can provide quality services to its customers.

The other significance of the study is that it will be used as a source of reference for other fellow researchers on the issue of pharmaceutical supply chain integration and help them capture the major theoretical knowledge about pharmaceutical supply chain integration.

1.7 Scope of the Study

Geographically, this thesis had assessed effect of pharmaceutical supply chain integration of DBCSH with its suppliers, customers and internally with its departments. It only evaluate the phenomena from the view point of the staff of the organization that have a direct contact with pharmaceutical supply chain works (including professionals from pharmacy, laboratory, OPD, emergency-OPD, X-ray, TB /Leprosy, and inpatient department). The operational scope covered the effect of pharmaceutical supply chain dimensions; internal integration, information integration, customer integration and supplier integration linkage in the perspectives of organizational performance dimensions including flexibility, delivery, cost and quality.

1.8 Operational Definitions

- **Internal integration**: represents the integration of all internal functions from material Management to sale and distribution (Baharanchi, 2011).
- **Information integration**: also called referential integration is the merging of information from heterogeneous sources with differing conceptual, contextual and typographical representation (Woods, 2016).
- **Supplier integration**: integration back down to the suppliers represents a change in attitudes from conflict to cooperation starting with product development, supply of high quality

products, process and specification change information, technology exchange and design support (Baharanchi, 2011).

- **Customer integration**: the firm will penetrate deep into the customer organization to understand the product, culture, market and organization so that it can respond rapidly to the customer's needs and requirements (Baharanchi, 2011).

- **Performance:** is the ability of the organization to fulfill customer needs.

- **Pharmaceuticals:** substances used for treatment, prevention, mitigation and diagnosis of diseases. It includes drugs, medical supplies and equipment's and laboratory reagents.

1.9 Organizations of the Study

The study comprised of five relevant chapters in which the study clearly state the entire process of the study, these includes:

Chapter one covers introduction, background of the study, statement of the problem, research questions, research objectives, significance of the study, scope of the study.

In chapter two theoretical and empirical literature reviews, conceptual framework of the study, identified literature gap and hypothesis would be addressed.

Chapter three   contain description of the study area, research design, population, sample and sampling methods, data source and data collection tools, ethical considerations, validity and reliability, data collection procedures and method of data analysis.

In the fourth chapter the results and findings of the study, interpretation and discussion of major findings and post estimation results are included.

The last chapter of the study includes summary of findings, conclusions and recommendations, as well as directions for future research.

CHAPTER TWO

LITERATURE REVIEW

This chapter discusses theoretical literature review, empirical literature review, and conceptual framework of the study. Under theoretical literature review overview of supply chain management, pharmaceutical supply chain in Ethiopian context, integrated pharmaceutical logistics method, supply chain integration, internal integration, information integration, supplier integration and customer integration with its dimensions have been addressed. The empirical literature review part addresses earlier conducted research results about effect of pharmaceutical supply chain integration on organizational performance and the relations ship between variables. Finally the conceptual framework of the study is presented by diagram and identified literature gap is presented.

2.1. Theoretical Literature Review

2.1.1 Supply chain Management Overview

Supply chain management is a process of associating several business entities consisting of suppliers, manufacturers, distributors, retailers and customers. These integrated entities are important in managing the flow of resources such as material flows (products, servicing, recycling), information flows (order transmission, tracking, and coordination of physical flows), and financial flows (credit terms, payment schedules, and consignment arrangements). As supply chains compete against supply chains, it is vital that they are managed effectively so as to enhance their performance (Hasan, Zulkifli, Malak, Nizaroyani, (2016).

Supply chain management is the model being used increasingly in the business world, leading organizations necessities in rethinking their strategies. Improvement on the proceedings involved in the network links of supplies has the synergetic effect on global network performance (Machado, 2013).

Moreover, supply chain management creates value for companies, customers and stakeholders whom interacting throughout the supply chain (Estampea D., et al 2013). In today's complex and changing business environment, enterprises must carefully develop their business strategies to gain a competitive advantage over the long term. Therefore, how to plan and formulate strategies for enterprises plays a decisive role (Chih C., et al (2016).

According to Heizer and Render (2011) SCM is the integration of the activities that procure materials and services, transform them into intermediate goods and final products and deliver them to customers. These activities include purchasing and outsourcing activities, plus many other functions that are important to the relationship with suppliers and distributors. SCM includes determining transportation vendors, credit and cash transfers, suppliers, distributors, warehousing, and forecasting and production information. On the other side Council of Supply Chain Management Professionals (CSCMP, 2012); consider supply chain management encompasses the planning and management of all activities involved in sourcing and procurement and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, SCM integrates supply and demand management within and across companies.

2.1.2 Pharmaceutical supply chain in Ethiopia

Pharmaceutical supply chain of Ethiopia is performed with two wings. The first is addressing those of the public health facilities through EPSA. The second is addressing the private health facilities through different importers, wholesalers and also EPSA to some extent. EPSA is a sole provider of forecasting, procurement, storage, inventory management and distribution of pharmaceuticals to the public health sector in Ethiopia. EPSA's current supply chain starts with the import of most drugs via the port of Djibouti and airport. These products are then trucked into central EPSA based in Addis Ababa, before being distributed to the various distribution centers (Hubs) and to the hospitals and health centers (Sutton and Kellow, 2010).

According to world bank, (2009) there are approximately 750 Health Centers operating in Ethiopia, with a planned expansion to 3,500 (1,500 are planned to be operational by July 2010). There are also 6,000 Health Posts operating, with a planned expansion to 15,000. The ultimate goal of this expansion is to have a Health Facility within a two hour walk of every Ethiopian citizen. The system is still largely push system as demand profiles that are used for pull system are unknown with the exception of HIV AIDS drugs and supplies.

2.1.3 Integrated Pharmaceutical Logistics System

EPSA has established pull system known as integrated pharmaceutical logistics system primarily using the essential data items reported from health facilities regularly every other month. Using its distribution centers (Hubs), EPSA will distribute drugs and supplies to public health facilities throughout the country (PFSA, 2012).

In 2009, as part of a major intervention to improve the supply chain situation in the country, PFSA, in partnership with its support partners the USAID | DELIVER PROJECT, Supply Chain Management Systems (SCMS), and others in the sector developed and began implementing the Integrated Pharmaceuticals Logistics System IPLS) (Mereid,2015). IPLS is the term applied to the single pharmaceuticals reporting and distribution system based on the overall mandate and scope of the PFSA. It aims to ensure that patients always get pharmaceuticals they need (PFSA, 2015).

EPSA is responsible for the procurement and distribution of pharmaceuticals for the public sector. To successfully achieve its main objective, which is to ensure that patients get pharmaceuticals that they need, EPSA designed and implemented the Integrated Pharmaceuticals Logistics System (IPLS). IPLS is the term applied to the single pharmaceuticals reporting and distribution system based on the overall mandate and scope of EPSA (PFSA, 2014).

The IPLS is the primary mechanism through which all public health facilities obtain products that are included on the National Pharmaceuticals Procurement List (NPPL). The list includes essential pharmaceuticals including the following that used to be managed vertically: HIV/AIDS, Malaria, TB and Leprosy, EPI, MCH (PFSA, 2014).

The IPLS defines the reporting and re-supply schedules. Accordingly, health facilities (hospitals and health centers) are expected to complete the Report and Requisition Form (RRF) every two months for program pharmaceuticals, the data of which will be used to determine re-supply quantity. To help maintain adequate stock levels, the maximum months of stock, minimum months of stock and an emergency order point have been established for each health facility in the system. For Revolving Drug Fund (RDF) pharmaceuticals, health centers and hospitals will complete the RRF as per the facilities review period which can be every two month, every quarter or every six months and collect products from affiliated EPSA branches (PFSA, 2014).

The 'Standard Operating Procedures (SOP) Manual for the Integrated Pharmaceuticals Logistics System in Health Facilities of Ethiopia' (herein after referred to as the IPLS SOP) defines the roles and responsibilities of the relevant stakeholders that are involved in the supply chain. The system also lists out the basic logistics data that are required to make logistics decisions with the accompanying definitions and data sources. All the relevant recording and reporting forms are also included with detailed instructions.

2.1.4 Supply Chain Integration

Supply chain integration can be defined as the degree to which a manufacturer strategically collaborates with its supply chain partners and collaboratively manages intra- and inter-organization processes to provide maximum value to the customer at low cost and high speed. This definition indicates that SCI is comprehensive and encompasses a variety of activities, some of them are internal, and others are external including both upstream with suppliers and downstream with customers. In order to comprehensively identify SCI, we break SCI into three dimensions: internal integration, supplier integration, and customer integration (Flynn et al. 2009).

Firms tend to integrate their supply chain systems with the channel partners to increase performance. The developments in supply chain management in the form of supply chain integration had not only offered the potential to reduce costs but also to increase revenues, profits and performance of the firms. But he also stated that there were some challenges associated with the integration of supply chain management by the channel members. The most significant form of supply chain integration was information sharing. (Awad & Nassa, 2010).

SCI is the extent to which a manufacturer has strategic collaboration and cooperation with supply chain partners and processes within and outside the organization runs, aim to achieve effective and efficient flow of products, services, information, money that lead to decisions which provide maximum value to the customer with low cost and high speed (Flynn et al., 2010).

A higher level of interaction between supply chain members can be explained in terms of building close and long-term relationships based on mutual understanding. Collaboration among supply chain actors is needed in order to compete in today's business environments. Long-term relationships that are created between supply chain partners based on collaboration need to be

underpinned by mutual understanding and willingness to maintain the relationship (Ismail Abushaikha, 2014).

There are factors that drive members of a supply chain to engage into a collaborative and integrated supply chain practices the most important motivators for supply chain integration in a firm are the need for supply chain agility, need for cost reduction, profit motives, satisfaction of customers, the need for collaboration with other organizations and bringing better relationship with suppliers Lisanza, (2013). As a result, if a company is going to succeed in today''s dynamic environment, specialization can be only part of the equation. All the parts of the organization that were originally segmented for the sake of efficiency have to be put back together in a way that maximizes customer outcomes and increases performance. In short, the internal and external functions of a business must become integrated for the enterprise to stand (Chad and Mark, 2016).

Supply chain integration composed of strategic initiatives in the supply chain through integration of communications, activities, tasks, processes and locations for continuous communication among customers, suppliers, producers and other members of the supply chain that emphasizes in creating an efficient and integrated system.. There are three basic types of Supply Chain Integration (SCI), which include supplier integration, internal integration, customer integration (Lai et al, 2012).

Supplier integration refers to acquiring operational, technical and financial information with the suppliers Manufacturers and suppliers may share information including production plans, demand forecasts and levels of inventory. This information sharing results in enhancing the product and production requirements and better utilizing the supplier's and the firm's capability and structure of cost (Zahra Lotfiet al.2013).

Internal integration is integration within all internal departments from incoming material to distribution. It involves integration across departments and functions under the control of the manufacture in order to fulfill customers' requirements. This suggests that more consideration should be given to interplay in the middle of functional departments, for instance production, procurement, logistics, inventory, marketing, sales and distribution (Zahra Lotfiet al.2013).

Customer integration is supply chain integration downstream. It is the outgoing set of products and services and the incoming set of data from customers to suppliers. Customer integration leads to creating a relationship with customers and hence gaining a better and clearer understanding of customers' references (Zahra Lotfiet al.2013).

SCI goal is to achieve effective and efficient flow of products and services, information, money and decisions, to provide a maximum value to customer at low cost and high speed (Flynn, Huo and Zhao, 2010) and many researchers like Flynn et.al, 2010 and BaofengHuo, 2012 pointed out that supply chain integration influences performance.

The main advantages of SCI are as follows (Palomero & Ricardo, 2012):

❖ The Integration of tasks and information exchange, cost reduction and identifying new business opportunities.
❖ Cooperation and coordination of all components along the chain, innovation of products, improving inventory management and warehousing, and improving performance.
❖ Advancing in selection and customer service providers and sharing and processing information simultaneously.

Although the internal and external integration is the key element for SCI, there is much emphasis on customer and supplier integration only, ignoring the important central link of internal integration. Internal integration and external integration play different roles in the context of SCI. while internal integration recognizes that the departments and functions within a manufacturer should function as part of an integrated process, external integration recognizes the importance of establishing close, interactive relationships with customers and suppliers (Flynn et al., 2010). The SCI involves both internal and external aspects of business. The key to SCI is to develop uninterrupted link with upstream suppliers and downstream customers along with total functional synergy internally. Therefore, integration could be achieved through three major interrelated activities – customer relationship management, internal SCM and supplier relationship management. The focus of this study will be mainly on the pharmaceutical supply chain integration dimension.

2.1.4.1 Internal Integration

The concept of internal integration (also mentioned as intra organizational or inter functional) is widely accepted in the field of Organizational Theory. An important concept was created by Lawrence and Lorsch (1967), presented as "the quality of the collaborating status among departments necessary to perform the effort unit according to the environmental demands." In the SCM context, internal integration is defined as "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" (FLYNN; HUO; ZHAO, 2010).

Internal integration is the coordinated and strategic alignment of business processes and functions within an organization that is organized to ensure that firm achieves maximum performance. SCI starts first with internal integration among the different departments and functions within an organization before external integration is pursued (Basnet, C., 2013).

Internal integration mainly involves data and information system integration through the use of enterprise resources planning (ERP), real-time searching of inventory and operating data, and integration of activities in different functional areas. Internal integration also involves cross-functional cooperation, or working together across different functions in process improvement or new product development. Internal integration recognizes that different functions within a firm should not act as functional silos, but instead as part of an integrated process (Zhao, et al.2011).

Without an internal culture focused on integration, the efforts towards external integration will occur slowly and in a more complicated way (Yunus and Tadisina (2016). Internal integration to SCI should occur before the external integration with suppliers and customers. (ZHAO et al., 2011; BASNET, 2013; VALLET-BELLMUNT; RIVERA-TORRES, 2013; ZSIDISIN et al., 2015). Some studies show that one of the reasons that hinder the achievement of a high-level external integration is low level of internal integration (Gimenez and Ventura 2005).

Intra-organizational integration is possible through developing appropriate synergy between each SC drivers (e.g. facility utilization and inventory policy, inventory policy and warehousing, logistics and information, etc.). Integrating sourcing with all the drivers

Intra-company integration is the starting point for broader integration across the Supply chain (Cagliano et al. 2006). Internal integration among functional areas is related to the increase of external visibility upstream and downstream of the supply chain (Barrat and Barrat (2011). Results demonstrated that the internal integration among functional areas is a pre-requisite for external integration success with suppliers in global supply chains (Horn, Scheffler and Schiele (2014). Literature suggests that firms must achieve a relatively high degree of collaboration among internal processes before initiating external integration (Cagliano et al. 2006). Maturity for the global performance is related to internal integration (Horn, Scheffler and Schiele (2014).

Integration of these functions involves the holistic performance of activities across departmental boundaries" (BASNET, 2013). In essence, internal integration refers to knowledge and information collaboration and sharing within and between functional areas (BRAGANZA, 2002; PAGELL, 2004). Collaboration refers to the development of unstructured activities of social and affective nature, and implies the existence of close and cohesive relationships. Interaction activities are also part of the internal integration process as formal and coordinated activities. These activities occur between functional areas, such as formal meetings and formation of committees. Both interaction and collaboration are described as "dimensions" of cross-functional integration (VALLET-BELLMUNT; RIVERA-TORRES, 2013).

More consideration should be given to interplay in the middle of functional departments, for instance production, procurement, logistics, inventory, marketing, sales and distribution (Zahra Lotfiet al.2013).

Reducing the ordering cycle, improving communication, creating new product projects quickly, developing better levels of customer service, improving the level of coordination across activities and increasing involvement of professionals are among the benefits of internal integration. Internal integration also improves the firm's performance by reducing costs and limiting the ability of departments within the organization from taking steps that would distort the overall goals of the organization (Ralston et al, 2015).

According to Donaldê Waters, 2010 and others information sharing, if handled well through accuracy and reliability, can lead to stronger integration in the chain in turn resulting to the better performance of the final firms operation.

2.1.5.2 Information Integration

Under information integration two aspects of supply chain information integration (information technology connection and information sharing and trust) will be discussed. Information and communication technology plays a central role in supply chain management in the following aspects. First, IT allows firms to increase the volume and complexity of information which needs to be communicated with in the firm and their trading partners. Second, IT allows firms to provide real-time supply chain information, including inventory level, delivery status, and production planning and scheduling which enables firms to manage and control its supply chain activities. Third, IT also facilitates the alignment of forecasting and scheduling of operations between departments, firms and suppliers, allowing better intra firm and inter-firms coordination. As such, the problems in coordinating supply chain activities which often are hindered by time and spatial distance can be reduced (Paulraj and Chen, 2007).

While the technological aspect of information integration is important, it is the frequency, the quantity and the quality of information that is shared that really matters. As Fawcett et al. (2007) held, large investments in IT could fail to produce expected benefits if it is not supported by willingness to share needed information. This is because information sharing requires firms to exchange strategic information of supply chain. The strategic supply chain information provides leverages to the supply chain partner for making strategic decision in their operations. For example, point of sale history helps suppliers to successfully forecast demand which subsequently improves service level and efficiency to their customers. Similarly, real-time inventory position helps suppliers to plan their replenishment and delivery schedules; thus, improving service levels and reducing inventory costs (Seidmann and Sundararajan, 1997). Such level of information sharing requires frequent and intense communication between firms and suppliers in order to build trust between the two parties. It is also true for intra firm information sharing between departments.

Indeed, trust is one of the key ingredients for all cooperative behaviors, including information sharing. High levels of trust in supply chain relationships constitutes high levels of cooperative behavior between supply chain partners which leads to high degree and symmetry of strategic-information flows between them (Klein, Rai, and Straub, 2007). In the absence of trust, the IT investment will be used at a minimal level as only transactional data is exchanged, such as

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materials or product orders. A number of studies have demonstrated various benefits of having information sharing with supply chain partners, including inventory reductions (Lee, So, and Tang, 2000; Yu, Yan, and Cheng, 2001), lower costs (Cachon and Fisher, 2000), and shorter lead times of order processing (Dejonckheere, Disney, Lambrecht, and Towill, 2004).

2.1.4.3 Supplier integration

Signifies the systematic process of linkage and interaction between company and suppliers to strengthen the effective flow of resources. The integration of Suppliers leads to significant improvements in terms of cost and quality while delivering products to customers. Through the management of suppliers strategically it is possible to increase the company's competitive power in terms of flexibility, reliability, cost and quality improvements (Otchere A.F. Jonathan Annan and Emanuel Kwabena Anin, 2013). A supply chain includes different stages involved, directly or indirectly, to satisfy customer requirements. The reflection of integration depends on the quality of collaboration among departments that is required to acquire unity of efforts by the interest of the environment. The touch point of supplier integration are many where a buyer"s process integrates with their seller"s process and provides solutions for each of those touch points and increases the value of both organizations when implemented. In the integration of supplier, a number of studies have found that, there is a positive association between supplier integration and operational performance (Petersen, K. J., Handfield, R. B., & Ragatz, G. L. 2005; Devaraj, S., Krajewski, L., & Wei, J. C. 2007). As for business performance, similar to customer integration, the few existing studies on this aspect have not found a direct positive association between supplier integration and business performance or between integration intensity and business performance (Rosenzweig, E. D., Roth, A. V., & Dean, J. W. 2003). But, Evans Mose (2013), have a different view on this aspect and illustrates, supplier integration and performance are positively and significantly related and it is an indication that enhancing supplier integration will lead to increased performance. Likewise ignoring supplier integration aspects can significantly affect the productivity of the organization.

2.1.4.4 Customer Integration

Customers Integration emphasizes with cooperation and interaction between a given and its customers, to ensure the effective flow of products or services to customers. Customer's integration involves sharing of customer's demand information, aiding producers to understand customer's demand in a better manner and expecting customer's demand as well as collaborating

and cooperating with customers to design, to reach products with better quality, lower costs and greater flexibility in response to customer's demand. Customer integration is directly related to operational performance (Otchere et al., 2013).

2.2. Empirical Literature Review

Almost all studies concluded that the supply chain integration is considered as vital process that affects operational performance, consequently the organizations' overall business performance. Internal integration aims at unifying the firms' skills, ideas and culture, thus enhances decision making and reduces the conflict of interest, risks and cost implications imposed to the firm (Lisanaza, 2013).

Flynn, et al. (2010) found that internal integration and customer integration were more strongly related to performance improvement than supplier integration. Supply chain partners who exchange information regularly are able to work as a single entity, and can understand the needs of the end customer better and hence can respond to market change quicker. Gimenez, et al. (2011) found that a positive effect of integration on performance in terms of profits, delivery speed, and transportation cost. Westbrook and Frohlich (2001); and Vickery, et al. (2003) found a positive and direct relationship between information technology integration and supply chain integration. Chen and Paulraj, (2004) said that: internal integration of different departments within a firm should act as integrated process. A research conducted by Mose (2015), titled impact of supply chain integration strategies on performance of pork processing industry in Rwanda (case of German butchery in Kigali); Internal integration and performance of pork industry were positively and significantly related. A prerequisite for successful SCM is internal integration and companies with a low internal integration strategy will achieve low level of external integration and companies implementing the full internal integration strategy will have the highest levels of external integration (Gimenez and Ventura 2005). Generally, it is believed that firms achieve a relatively high degree of internal integration before they attempt to develop a higher degree of external integration (Otchere et al. 2013).

According to the study of Koçoglu ipek , Salih Zeki imamoglu, Hüseyin ince, Halit Keskin (2011),sharing of information across the chain is a key and critical component in achieving an integrated supply chain because it is believed that SCI increases collaboration, minimizes uncertainty, increases the speed of material flow, accelerate order fulfillment, reduction of

inventory costs, increases the satisfaction of customer through reliable and fast delivery of products, improve performance and increase operational effectiveness.

2.2.1 Organizational Performance

Academicians and researchers have investigated organizational performance from many different perspectives. Wang,et al. (2009) developed organizational performance measures based on efficiency. Gimenez, et al. (2011) studied profits, delivery speed, quality and transportation costs as a performance measures. Vanichchinchai, 2014 investigated firm's supply performance that composed of flexibility, cost, relationship and responsiveness. Many researchers assume it to be improved by SCI take very different types of performance into account: from pure operational logistics performance (such as inventory level, response time, service quality or logistics cost) to broad strategic performance (e.g. improved competitive position, profitability and growth), often including customer value and satisfaction. They also look a performance for differing units of analysis such as the pharmaceutical supply chain, a company, a business unit or a plant in respect of how performance is measured the majority includes items related to logistics and SCM performance (Fabbe-Costes, 2008 cited inAsawin Pasutham, 2012).

The most common indicators of organizational performance that are investigated in the previous studies are flexibility, delivery (speed) quality and cost. This thesis studies the above indicators of organizational performance.

2.2.1.1 Flexibility

Flexibility is described as the ability of a system of an organization in responding quickly to changes occurred both inside and outside the system. The final achievement in the performance of an organization is to gain competitive advantage and creating customers satisfaction.

Flexibility is expressed through the capability of a system to undertake proactive and reactive adaptation of settings to deal with uncertainties which occur both internally and externally uncertainty. In the pharmaceutical supply chain, the main purpose for flexibility is to increase the simplicity of processes that adds value and to shorten the time of response to the demand of the customer. In today's business world the complexity of business process is rising, so businesses must be customer oriented. Companies can take different measures to improve their products and increase their flexibility and one of the measures is to outsource some of their products to other companies (Singh &Sharma, 2014).

2.2.1.2 Delivery

Delivery performance can be defined as the level up to which products and services supplied by an organization meet the customer expectation. It provides an indication of the potentiality of the pharmaceutical supply chain in providing products and services to the customer. This metric is most important in pharmaceutical supply chain management as it integrates (involves) the measurement of performance right from supplier end to the customer end (Rao et al., 2011). In manufacturing industries, delivery is seen in both directions from the suppliers and customers side. A delayed delivery will lead to a higher procurement cost in the supplier and a potential lose in sales to end customers.

2.2.1.3 Cost

One of the indexes for improving operational performance is reduction of its cost. Proper cost management implies the optimal use of resources for the efficiency of organization in order to create value for customers. Due to this rationale the satisfaction of customer's and loyalty and long lasting wealth for the organization will be created. Effective way of managing cost is the result of managing decisions (Patterson & Anders, 2013). Cost management produces valuable resource endowment, which leads to create value to the end customers and also increase satisfaction to customers (Lu et al., 2017).

2.2.1.4 Quality

Quality is highly related with the extent of communication among members of the pharmaceutical supply chain. At this point quality of communication is expressed based on the degree accuracy, adequacy, level of update, and completeness in the process of communication among partners of pharmaceutical supply chain. Quality of communication is inferred based on the system of information; outsourcing and other related organizational relationships are considered as key variables in the relationship along partners of pharmaceutical supply chain. In order to establish and maintain effective cooperation, the company should strive to create a meaningful and high-level communication with pharmaceutical supply chain partners to enhance the quality and involvement along the pharmaceutical supply chain. Quality of communications plays a pivotal role in integrating activities related to organizational system in which quality of effective communications aids to integrate sustainable pharmaceutical supply chain. The ultimate point is that, there is an acceptable relationship between quality of communication and

pharmaceutical supply chain integration in which the effect may be direct and indirect (Lin, 2013)

2.3. Conceptual framework

The conceptual framework for this study developed from the individual effects which presented the unique influence of pharmaceutical supply chain integration on the success of an organization. Supply chain integration (SCI) helps firms to reconfigure their resources and capabilities internally and externally to consolidate their pharmaceutical supply chain as a whole in an effort to improve long term performance (Horvath, 2001). According to Mollenkopf and Dapiran (2005) internal integration, information integration (II), supplier integration and customer integration were sketched as elements of SCI in the dimension of organizational performance.

Many studies confirm that the higher the level of integration the higher the operational and business performance of the firm (Gimenez & Ventura, 2005) in the perspectives of pharmaceutical supply chain integration.

Independent Variables   **Dependent Variables**
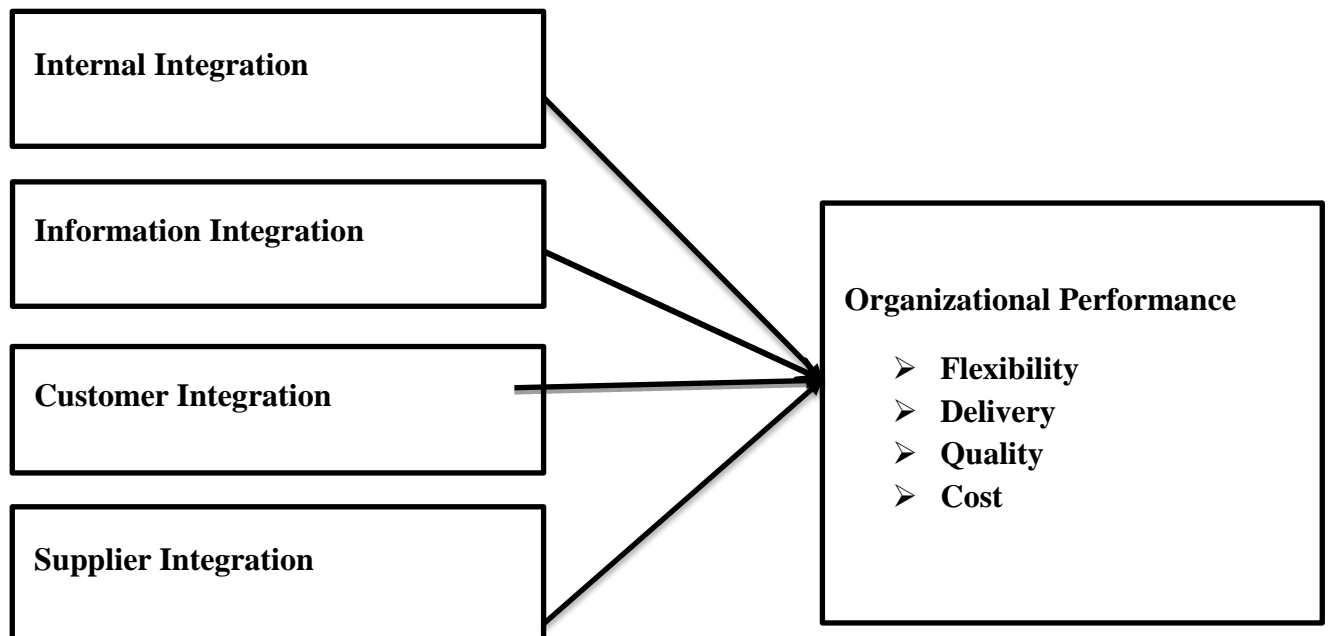
Figure 2.1 Conceptual models for supply chain integration.

Source: adapted from Hussein *et al*, 2014

2.4 Identified Literature Gap

The literatures that are conducted on integration are mostly on firms other than pharmaceutical supply chain. It makes the area of pharmaceutical supply chain integration the most valuable area to conduct a thesis and there are more ideas that are not covered by such type of studies.

2.5 Hypothesis

Based on the assumed causal relationship given in the conceptual model on the pharmaceutical supply chain perspectives the following hypotheses were developed for testing.

- H1. Internal integration has a significant influence on the organizational performance of debre birhan comprehensive specialized hospital.

- H2. Information integration has a significant influence on the organizational performance of the debre birhan hospital.

- H3. Customer integration has a significant influence on the organizational performance of the debre birhan hospital.

- H4.supplier integration has a significant influence on the organizational performance of the debre birhan hospital.

CHAPTER THRE

METHODOLOGY OF THE STUDY

Description of the study area, research design, population, sample and sampling techniques, data source and data collection tools, ethical considerations, validity and reliability, data collection procedures and method of data analysis will be discussed in this chapter.

3.1. Research approach

According to Creswell (2014), there are three research approaches namely, the quantitative, qualitative and mixed approaches. This study used quantitative approach, which is used for examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures.

3.2. Research design

Research design is defined as a strategic framework for action that serves as a bridge between research questions and the execution or implementation of the research (Ornstein, 2013).It is a framework of methods and techniques chosen by a researcher to combine various components of research in a reasonably logical manner so that the research problem is efficiently handled. It provides insights about "how" to conduct research using a particular methodology. Saunders & Lewis (2014) outlined different types of research methodology into categories as exploratory, descriptive and explanatory.

In this study explanatory research designs were used. In the explanatory research design explanation about pharmaceutical supply chain integration aspects were provided. The reason to use an explanatory research for this study is to justify the cause-effect relationships between the study variables (information integration, internal integration, customer integration and supplier integration) on organizational performance.

3.3. Source of data

The data needed to assess the effect of pharmaceutical supply chain integration on organizational performance mainly obtained from the study participants' by questionnaire. By questionnaire primary data were collected and secondary data were collected from annual reports. Data related to organizational level variables are collected from a variety of sources such as financial records,

activity and financial reports and interview and/or surveys of Chief Executive Officers (CEO), who are presumed to be representing of their organization.

3.4. Population and sampling

3.4.1. Target population

Creswell (2013) has defined a target population as gathering of individuals and items that are the main emphasis of a scientific enquiry. The target populations in this study were all the 460 health professionals those working in debre birhan comprehensive specialized hospital directly involved in the supply chain of pharmaceuticals. Since this study investigates the effect of pharmaceutical supply chain integration on organizational performance, the population included all professionals (pharmacists, laboratory technologists, biomedical engineers, doctors, nurses, radiologists and midwifes) that are participated in the pharmaceutical supply chain.

3.4.2. Sample framework

The sample frames was extracted from the total organizational setup according to their proximity to the main functions of the deber birhan hospital. The respondents were identified from the seven internal departmental strata of debre birhan comprehensive specialized hospital which are directly involved in the supply chain of pharmaceuticals according to the following list.

S.No	Stratum	Population
1	Pharmacy	33
2	Laboratory	29
3	Outpatient department	30
4	Emergency department	16
5	x-ray	8
6	TB/Leprosy	3
7	inpatient department	21
	Total	**140**

Table 3.1 populations and sample list by strata

3.4.3. Sample size and techniques

Sampling design and the sample size are important for establishing the representativeness of the sample in terms of generalizability of the subsequent findings to the entire population of interest (Veal 2005). Sampling is the process of selecting a sufficient number of members of the population of interest, which can be done purposefully and/or randomly. For this study, as the population size is large, it is important to apply sampling techniques to select study participants (Sekaran 2003). Consequently, the study adopts random sampling techniques employed based on the stratified approach of the departments. The reason for using stratified simple random sampling is that first, we can have more precise information inside the sub-population about the variables we are studying. And second, we can raise precision of the estimate of the variables of the whole population. Additionally, the samples were gathered by direct interviewing the leader of the department, who are concerned pharmaceutical supply chain in the organization.

According to Taro Yamane''s (1973), this study applied a simplified formula to determine the required sample size at 95% confidence level, and allowable error = 0.05% and number of employees who worked within the lines of pharmaceutical supply chain of the organization are **140**.

$$n = \frac{N}{1+N \, (e)^2}$$

Where **'n'** is the sample size, **N** is the total number of workers who works in the lines of pharmaceutical supply in the organization, and **'e'** is the level of precision. Substitute numbers in formula:

$$n = \frac{140}{1+140(0.05)^2}$$

n = **102**

After calculating the sample size by substituting the numbers into the Yamane formula, the
Numbers of sample is **102**.

S.No	Stratum of departments	Target Population	Sample size proportion
1	Pharmacy	33	$\frac{33*102}{140} = 24$
2	Laboratory	29	21
3	Outpatient department	30	22
4	Emergency department	16	12
5	x-ray	8	6
6	TB/Leprosy	3	2
7	inpatient department	21	15
	Total population	**140**	**102**

Table3.2 Sample size proportion in each department

According to the above formula given, **102** employees became a representative samples for the study. Those studies consider permanent employees of the company which are selected by using stratified sampling based on the concern.

3.5. Data collection tools
In order to capture the basic concepts of the study the researcher use data collection tools by standard questionnaire   Evans M.mose (2013). The necessary data was collected by using self-administered close-ended questionnaire from the above stated departments.

3.6. Data collection procedures
The study use primary data that was collected by survey (questionnaire). The researcher was targeted the professionals that are directly involved in the supply of pharmaceuticals which are selected in the sample. The questionnaires were administered to the participants directly by hand in hard copies and were returned to the researcher based on the negotiated time.

3.7. Data analysis

The collected data was reviewed for completeness and accuracy upon completion of the data collection process. Thereafter, the data was sorted and coded, then entered into the Statistical Package for Social Sciences (SPSS) version 20. Demographic information obtained from the respondents was analyzed and presented using descriptive statistics in the form of frequency and percentage table. Measure of central tendency and measure of dispersion like mean and standard deviation was used to analyze the practice of pharmaceutical supply chain integration. Correlation analysis was used to determine the relationship between pharmaceutical supply chain integration study variables and organizational performance. Cause-effect analysis was made by using multiple linear regression analysis since there are more than two independent variables. The result of analyzed data was presented using tables and charts with a brief description.

3.8. Validity and reliability of study

The validity of the study included the content validity, construct validity and internal validity. The content validity was assured by using multiple sources of data (literature such as previous studies, expert interviews) to develop and refine the model and measures. The construct validity which deals with the consistency of the questions has been assured by structuring the questionnaire according to the specific objectives. To ensure internal validity, the research was builds on explanations drawn from supply chain management theory and existent literature, and addresses rival explanations for the results. practitioners and researchers review was conducted to confirm that the findings generalizability for external validity.

According to Weiner (2007), reliability is the degree to which a measurement technique can be depended up on to secure consistent results upon repeated application. The reliability was tested by using the Cronbach's Alpha coefficient value. Cronbach Alpha should be over 0.70 to produce a reliable scale and any scale with Cronbach Alpha less than this standard should be eliminated (Sekaran 2005). George and Mallery (2003), states that at least a value of 0.7 is recommendable and therefore the instrument was accepted as highly reliable.

Reliability Statistics

Table 3.3 Cronbach's Alpha coefficient value

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.947	.947	27

Source; own computation, 2021

As indicated in table 3.3 the Cronbach's Alpha value is 0.947 which is greater than 0.7.So the instrument utilized was highly reliable.

3.9 Ethical consideration

Ethics in social studies refers to a code of conduct and adherence to expected social norms and behaviors while conducting research. Ethical conduct should also be reflected in the behavior of the researchers who conduct the investigation, the participants who provide the data, the analysts who provide the results and the presentation of the study findings (Veal 2005). In conducting this thesis the privacy of the participants was kept in secret and it has not any impact or harm either on participants or the organization. Instead it will give a direction to avoid any defect regards to integration. So it is beneficial for both the study participants and the organization. The study ensured adequate level of confidentiality of the research data and any exaggeration about the aims and objectives of the research has been avoided. In the data collection process, respondents had been informed that the activity will be performed if they are willing to assist. If necessary and requested by the firm, the researcher is willing to submit a copy of the research paper before it is publicized. In addition, everyone involving in the data provision process was aware that the materials organized by the researcher are intended for academic purpose only.

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter presents results and related analysis of the data on the effect of pharmaceutical supply chain integration on organizational performance at DBCSH. Major findings of the study have been illustrated by using statistical instruments under this chapter. It includes four subsections which Discuss about demographic characteristics, descriptive statistics (mean and standard deviation), Correlation analysis and finally regression analysis.

Out of 102 questionnaires distributed to respondents 100questionnaires are filled and returned correctly to the researcher. This represented 99.04% response rate. Mugenga, (2003) pointed that for generalization a response rate of 50% is adequate for analysis and reporting, 60% is good and a response rate of 70% and over is excellent. So the response rate of this thesis was reliable and excellent.

4.1 Demographic Characteristic

This section discusses the general information about gender, age, educational background, profession of in charge and departments of work in DBCSH. The data processed by SPSS version 20 is presented as follows.

Table 4.1: Gender distribution of respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	58	58.0	58.0	58.0
	Female	42	42.0	42.0	100.0
	Total	100	100.0	100.0	

Source; Survey Results and Own Computation, 2021

As indicated on table 4.1 from 100 respondents 58 (58%) were male and the rest 42 (42%) were female. This statistics shows more of the respondents were males.

Table 4.2 Age group of respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 25 years	10	10.0	10.0	10.0
	26-34 years	76	76.0	76.0	86.0
	35-44 years	14	14.0	14.0	100.0
	Total	100	100.0	100.0	

Source; Survey Results and Own Computation, 2021

Table 4.2 describes the age distribution of respondents for the questionnaire distributed to study the effect of pharmaceutical supply chain integration on organizational performance. The statistics showed 10 respondents were less than 25 years which have 10 percentages from the total 100 respondents. 76 respondents were in the age group 25-34years with 76 percentages. 14(14%) respondents were from 35-44 years. So according to the statistics computed most of the respondents (76%) were in the age group 25-34 years which is known as the productive age group.

Table 4.3: Educational Background of respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma	15	15.0	15.0	15.0
	BA/Bsc degree	59	59.0	59.0	74.0
	Msc/MA	21	21.0	21.0	95.0
	Medical Doctor	5	5.0	5.0	100.0
	Total	100	100.0	100.0	

Source; Survey Results and Own Computation, 2021

According to the statistics presented on table 4.3, 15 (15%) respondents were diploma holder, 59 (59%) had BA/BSc degree and 21 (21%) had MSc/MA, 5(5%) of respondents had Medical doctor. The statistics shows 59 (59%) of respondents had first degree which is the highest percentage of respondents. This suggests that the respondents provide relevant and accurate information needed for the study on the effect of Pharmaceutical supply chain integration on organizational performance.

Table 4.4 Profession of respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Nurse	46	46.0	46.0	46.0
	Pharmacist	24	24.0	24.0	70.0
	Laboratory	21	21.0	21.0	91.0
	Radiologist	4	4.0	4.0	95.0
	Medical Doctor	5	5.0	5.0	100.0
	Total	100	100.0	100.0	

Source; Survey Results and Own Computation, 2021

Irrespective of the high educational levels of the respondents, the researcher finds it necessary to find the specific professional qualifications of the respondents in order to have a fair view of their capacity to comply with the research questions. The research established that understanding prospects of pharmaceutical supply chain integration requires professionalism and therefore requires staff with supply chain qualification and training in order to understand the practice of pharmaceutical supply chain integration. As indicated in table 4.4 nurse took the highest percentage with 46(46%) from the total of 100 respondents. The rest professions were 24 (24%) pharmacist, 21 (21%) laboratory technologists, 4(4%) radiologist and 5(5%) medical doctors. All respondents were with a great understanding about pharmaceuticals/Medicine and its integration since most of them had an academic base of supply chain

Table 4.5: Experience of respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5 years	26	26.0	26.0	26.0
	6-10 years	44	44.0	44.0	70.0
	11-15 years	22	22.0	22.0	92.0
	over 15 years	8	8.0	8.0	100.0
	Total	100	100.0	100.0	

Source; Survey Results and Own Computation, 2021

Ultimately, the output in Table 4.5 shows that, 26 % of the respondents indicated that they had work experience of 1 to 5 years while 44 % of the respondents said they had experience of 6 to 10 years and also 22 % of the respondents replied that they have worked for 11-15 years. 8 % of respondents had an experience of greater than fifteen years. The results indicated that majority of the respondents have an experience in working area between 6 to 10 years. The respondents were aware of the modern application and implication of supply chain procedures and therefore they gave the correct and accurate information the researcher needed for the study.

Table 4.6: Department of respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Pharmacy	24	24.0	24.0	24.0
	Inpatient	15	15.0	15.0	39.0
	x-ray	4	4.0	4.0	43.0
	Tb/Leprosy	2	2.0	2.0	45.0
	Laboratory	21	21.0	21.0	66.0
	Emergency OPD	12	12.0	12.0	78.0
	Outpatient	22	22.0	22.0	100.0
	Total	100	100.0	100.0	

Source; Survey Results and Own Computation, 2021

The respondents were also asked to indicate the departments they are working in. 24 of respondents (24%) were working in pharmacy and 15 (15%) respondents were from Inpatient department,21(21%) respondents were in laboratory department,12(12%) respondents were in emergency department and 22(22%)were worked in outpatient department. From the seven departments of the researchers target X-ray and TB/leprosy department had the minimum number of respondents with a figure of 4 (4%) and 2 (2%) respectively. The largest number of respondents 24(24%) were from pharmacy, since it has many supply chain operations.

4.2 Descriptive Analysis of Independent Variables

Descriptive analysis is the analysis of data that helps to describe, show or summarize data in a meaningful way. It is very important because raw data would be hard to visualize what the data was showing, especially if there was a lot of it (Kline, 2010). Descriptive statistics therefore enable the

researcher to present the data in a more meaningful way, which allows simpler interpretation of the data. Measure of central tendency like mean offers a general picture of the data without unnecessarily covering one with each of the observations in the data set. The mean of respondents in each dimensions of pharmaceutical supply chain integration suggest that the average amount that each dimension has positive or negative response. In this case, the mean of each item together with their respective dimension overall mean/average mean was calculated in order to conclude the overall pharmaceutical supply chain integration of DBCSH. The mean statistical values of the items were based on the 5 point Likert scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree and 5=strongly agree). According to Zedatol (2008), cited by Oumar (2012), mean score 3.80 and above is high, 3.40 – 3.79 is moderate and below 3.39 is low.

4.2.1 Internal Integration in DBCSH

Table 4.7 mean and standard Deviation of internal integration

	N	Mean	Std. Deviation
Better data integration among internal function	100	2.39	.973
Enterprise application integration	100	2.28	.975
Strong integrative inventory management	100	2.51	.904
Real time sharing of the level of inventory	100	2.65	.989
Utilizing periodic interdepartmental meeting	100	2.72	1.120
Use of cross functional team in process improvement	100	2.67	1.146
Valid N (listwise)	100		
Average Mean value		**2.54**	

Source; Survey Results and Own Computation, 2021

Respondents were asked for the extent of their knowledge towards the influence of internal Integration on organizational performance and the statistics on table 4.7 showed the mean value between 2.28 and 2.72 and a standard deviation between 0.904 and 1.146. The overall mean of respondent's knowledge on influence of internal integration on organizational performance is 2.54

which indicated respondents disagree on the higher influence of internal integration on organizational performance. The highly influenced item was utilizing periodic interdepartmental meeting with a mean of 2.72 followed by use of cross functional teams in process improvement with a mean value of 2.67.Real time searching of level of inventory with a mean of 2.65.Strong integrative inventory management and better data integration with a mean value of 2.51 and 2.39 respectively. The item which was less influenced from the others was enterprise application integration with the mean value of 2.28.

4.2.2 Information Integration

Table 4.8 mean and standard Deviation of information integration

	N	Mean	Std. Deviation
Free sharing accurate information across member of pharmaceutical supply chai	100	2.32	1.024
Timely sharing of information	100	2.37	.981
Strong coordination in the flow of information	100	2.31	1.002
Strong utilization of information	100	2.19	1.070
Valid N (listwise)	100		
Average Mean value		**2.30**	

Source; Survey Results and Own Computation, 2021

The above table 4.8 showed that the mean and standard deviations for questions asked to rate the effect of information integration in organizational performance at DBCSH. The mean values for the questions range between 2.19 and 2.37. According to Zedatol (2008) mean value below 3.39 indicates low. The statistics showed that timely sharing of information across the members of supply chain, high level of free sharing of accurate information, have a mean value of (M=2.37, 2.32 and S.D= 0.981 and 1.024) respectively which is higher than the other mean values. The least mean values are scored by different departments engagement Strong coordination in the flow of information and strong utilization of information among supply chain partners have a mean value (M=2.31,2.19) and standard deviation (S.D=1.002 and 1.070).

The overall mean value for information integration is 2.30 and rated as there is low information integration at DBCSH. According to the study of Koçogluipek, et al., (2011), sharing of information

across the chain is a key and critical component in achieving an integrated pharmaceutical supply chain because it is believed that SCI increases collaboration, minimizes uncertainty, increases the speed of material flow, accelerate order fulfillment, increases the satisfaction of customer through reliable and fast delivery of products, improve performance and increase operational effectiveness. So the low level implementation of information integration in DBCSH adversely affects the organization performance in terms of pharmaceutical supply chain.

4.2.3 Supplier Integration

Table 4.9 mean and standard Deviation of supplier integration

	N	Mean	Std. Deviation
Strong information exchange with major supplier through information network	100	2.17	.943
Quick ordering system	100	2.23	.920
Strong strategic partnership	100	2.27	.993
Stable procurement through network	100	2.31	.907
Valid N (listwise)	100		
Total mean value		**2.24**	

Source; Survey Results and Own Computation, 2021

As table 4.9 stated the mean values for the supplier integration questions range between 2.17 and 2.31. Stable procurement through network with major supplier has (M=2.30, S.D=0.907) which is the highest from the rest. Next, strong strategic partnership with major supplier has (M=2.27, S.D=0.993). The last two questions quick ordering system with major supplier have a mean score of ((M=2.23, S.D=0.920) and (M=2.17, S.D=0.943) respectively. The average mean value of supplier integration (M=2.24) indicated that there is low supplier integration in DBCSH. The result indicated DBCSH adversely affected by lack of efficient supplier integration. Moreover, the results obtained depicts that Supplier integration has a significant influence on operational performance of the organization which aligns with the finding of chee yew Wong, sakun boonitt, Christina w.y.wong

(2011) And Petersen *et al* (2007). And also Dametew, W. et al. (2016) founds that resource integration affects quality of organizational performance.

4.2.4 Customer Integration

Table 4.10 mean and standard Deviation of customer integration

	N	Mean	Std. Deviation
Linkage with customer through information network	100	2.12	1.047
Computerized system for major customer order	100	2.18	.978
Use of effective communication	100	2.13	.928
Establishment of quick ordering system	100	2.37	1.051
Follow up with customer feedback	100	2.29	1.113
High frequency of periodic contacts	100	2.39	.952
Valid N (listwise)	100	**2.25**=total	

Source; Survey Results and Own Computation, 2021

The result stated in table 4.10 showed that the mean values of customer integration items are between 2.12 and 2.39. High frequency period contact with major supplier took the highest mean value (M=2.39, S.D=0.952) while the least mean value (M=2.12, S.D=1.047) is scored by linkage with customer through information network in different departments in to a a establishment of quick ordering system with major supplier (M=2.37, S.D=1.051) and follow up with major customer for feedback (M=2.29, S.D=1.113) have scored between the maximum and minimum mean values.

The overall mean value for customer integration 2.25 and is at low level. As of the pharmaceutical supply chain integration dimensions in DBCSH poorly implemented customer integration. This means that improving the extent to which the industry ensures customer integration has a great potential to improve the organization performance. With a low level of customer integration, a focal firm is more likely to receive inaccurate or distorted supply and demand information, which results in high level of inventory and poor delivery reliability (Lee *et al*., 1997).

4.3 Descriptive Analysis of organizational performance

Table 4.11 mean and standard Deviation of organizational performance

	N	Mean	Std. Deviation
Quick response by the company to change in clients need and cases	100	2.25	.903
On-time delivery record to customer	100	2.35	1.048
Provide cost effective service	100	2.74	1.041
Lead time for fulfilling customers order is short	100	2.44	1.038
Quickly modify pharmaceutical supply chain process	100	2.43	1.066
Provide high level of customer service	100	2.42	.901
Provide quality of service	100	2.35	1.114
Valid N (listwise)	100	**2.42**=total m	

Source; Survey Results and Own Computation, 2021

Table: 4.11 showed that the average mean of dependent dimensions is between 2.25 and 2.74, with standard deviation between 0.903 and 1.041, which indicate that there is a low organizational performance in DBCSH among four dependent dimensions.

From the dimensions of organizational performance statistically respondents disagree on the issue of quick response by the company to change clients need and cases with a lowest mean score of (M=2.25, SD=0.903),on time delivery record to customer by the company with mean score of (M=2.35, SD=1.048).Followed by the provision of cost effective service to the customer, lead time for fulfilling customers' orders, quickly modify pharmaceutical supply chain process to meet customer requirement, provide high level of customer service and provide better quality of service with a mean score of (M=2.74, SD=1.041), (M=2.44, SD=1.038),(M=2.43 ,SD=1.066) ,(M=2.42, SD=0.901), (M=2.35, SD=1.114)respectively.

The overall mean of the dimensions of organizational performance is 2.42, which mean there is low organizational performance at DBCSH. This is due to the poor implementation of pharmaceutical supply chain integration dimensions. Flyn et al., (2011), Gimenez et al., (2011) and Frohlich, (2001) found a positive effect of pharmaceutical supply chain integration on organizational performance in terms of flexibility, delivery speed, cost and quality.

4.4 Correlation Analysis

Correlation is the relationship between two variables. So, the researcher would like see the nature, direction, and significance of the bivariate relationship of the variables used in the study. The Bivariate Correlations procedure computes the pair wise associations for a set of variables 27 and displays the results in a matrix. It is useful for determining the strength and direction of the association between variables. A Pearson correlation matrix indicates the direction, strength, and significance of the bivariate relationships of all the variables in the study. Correlation coefficient is a very useful means to summarize the relationship between two variables with a single number that falls between -1 and +1.The general symbol for the correlation coefficient is "r". So, a perfect positive relationship (r=+1) indicates a direct relationship and an "r" of -1 indicates a perfect negative relationship while zero "r" value indicates there is no association between the variables. The specific assumption on correlation coefficient indicates that if "r" is between zero and 0.3(-0.3) the correlation is negligible. For "r" between 0.3 and 0.5 (-0.3 and -0.5) low positive (negative) correlation is assumed. "r" value from 0.5 to 0.7 (-0.5 to -0.7) indicates moderate positive (negative) correlation and "r" value between 0.7 and 0.9 (-0.7 and -0.9) indicates high positive (negative) correlation. Very high positive (negative) correlation is represented by "r" value between 0.9 and 1 (-0.9 and -1) (Mukaka, 2012). Hence, in this study Bivariate Pearson Coefficient (r) was used to examine the relationship between variables by using a two-tailed test of statistical significance at the level of 95% significance, P< 0.05.

Table 4.12: Bivariate Pearson Correlation between dependent and independent Variables

Correlations

	Internal integration	Information integration	Supplier integration	Customer integration	Organizational performance
Internal integration	1	.743** .000	.630** .000	.674** .000	.648** .000
Information integration	.743** .000	1	.639** .000	.619** .000	.595** .000
Supplier integration	.630** .000	.639** .000	1	.612** .000	.579** .000
Customer integration	.674** .000	.619** .000	.612** .000	1	.669** .000
Organizational performance	.648** .000	.595** .000	.579** .000	.669** .000	1

**. Correlation is significant at the 0.01 level (2-tailed).

Source; Survey Results and Own Computation, 2021

The Bivariate Pearson correlation coefficient outcome indicated there is a moderate positive correlation between organizational performance with internal integration and customer integration, (r=.648**) and r= .669** respectively. Westbrook and Frohlich (2001); and Vickery, et al. (2003) also found a positive and direct relationship between internal integration and customer integration with organizational performance. The other two independent variables (information integration and supplier integration) have a moderate positive correlation with the dependent variable organizational

performance with r= .595[**] and r=.579[**] respectively. Liu, H., (2013) and Damtew, W., et al., (2016) also found that and customer integration have a direct positive relationship with organizational performance. Therefore, the finding of the correlation analysis shows that all the independent variables (internal integration, information integration, supplier integration and customer integration) are positively related with the dependent variable organizational performance at 99 percent confidence interval. All the four independent variables have a moderate degree of correlation coefficients, which means increasing these independent variables implementation leads increased organizational performance.

4.5 Regression Analysis

A regression analysis is the determination of relationship between explanatory variables and explained variable, which is used to generate a predicted value or estimates of variables and cause effect inferences. The study takes three explanatory variables, which makes the regression analysis a multivariate regression analysis. A multiple regression analysis is conducted when there are two or more independent variables on the specified model (Wooldridge, 2015).

4.5.1 Multi Collinearity

Multicollinarity is the extent to which a particular construct can be explained by other constructs in the analysis (Hair et al., 2010). It occurs when the variables that appear distinct and unrelated actually measure the same thing. Multicollinarity test can be conducted using tolerance or VIF factor and by rule of thumb, VIF ≤ 10 and tolerance > 0.2 are acceptable to say there is no multicollinarity problem (Gujarati, 2003)

Table 4.13multicollinarity

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1,	(Constant)		
	Internal integration	.361	2.769
	Information integration	.391	2.556
	Supplier integration	.499	2.005
	Customer integration	.477	2.097

a. Dependent Variable: Organizational Performance

Source; Survey Results and Own Computation, 2021

As the result in table 4.13 states there is no multicollinarity effect since the tolerance of independent variables is above 0.2 and VIF value is less than 10. The inter relationships among independent variables doesn't cause concern. Therefore, as the indication of statistics that multicollinarity is not the problem of the study.

4.5.2 Model Summary

Table 4.14 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.734[a]	.539	.519	3.78930	2.219

a. Predictors: (Constant), customer integration, supplier integration, information integration, internal integration

b. Dependent Variable: organizational performance

Source; Survey Results and Own Computation, 2021

R_2 is called the coefficient of determination; it is the proportion of the variance in the dependent variable (organizational performance) explained by variations in the independent variables. It shows the level of variance explained by the model; which indicates how the organizational performance varies with variation in internal integration practices, Information Integration, supplier integration and customer integration. The finding showed that, the independent variables (internal integration, Information Integration, supplier integration and customer integration) that were studied, explain only 53.90% performance of the organization, in case of DBCSH as represented by the R_2while the rest 46.10 % of variation is explained by variables that are not included in the model. Therefore, further research should be conducted to investigate the pharmaceutical supply chain integration dimensions (46.10%) that have a role for the performance of the organization.

According to Wooldridge (2015), The Durbin-Watson statistic ranges in value from 0 to 4. A value near 2 indicates non-autocorrelation. As indicated in table 4.13, the Durbin-Watson test statistics showed a value 2.219 which approaches to two; therefore there is no autocorrelation problem between residuals.

4.5.3 ANOVAa

Table 4.15: ANOVA Table

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	1591.876	4	397.969	27.716	.000[b]
1	Residual	1364.084	95	14.359		
	Total	2955.960	99			

a. Dependent Variable: organizational performance

b. Predictors: (Constant), customer integration, supplier integration, information integration, internal integration

Source; Survey Results and Own Computation, 2021

As indicated in Table 4.15, the model is adequate with 5 percent significance level. The F-value 27.716 indicate that the joint effect of the variables is significant at 95 percent confidence level. Thus the model is statistically significant in predicting how internal integration, information integration, supplier integration and customer integration affect the performance of the organization.

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4.5.4 Regression Coefficient

Table 4.16: Regression coefficient

Coefficients[a]

Model	Un standardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	T	Sig.
(Constant)	2.777			1.933	.056
Internal integration	.298	.143	.241	2.082	.040
Information integration	.168	.179	.105	.940	.350
Supplier integration	.256	.174	.145	1.467	.146
Customer integration	.431	.123	.353	3.494	.001

a. Dependent Variable: organizational performance

Source; Survey Results and Own Computation, 2021

Table 4.16 indicated that the standardize beta value shows the number of standard deviations that the outcome will change as a result of one standard deviation change in predictor. The standard deviation units are directly comparable; therefore, they provide a better insight in to the importance of a predictor in the model. The large value of beta coefficient in an independent variable has the more important determinant in predicting the dependent variable. The standardize beta value for customer integration dimension is 0.353. This implies that, this variable has relatively strong degree of importance for analyzing the effect of pharmaceutical supply chain integration than others. Respectively, the standardized beta value for internal integration, supplier integration and information integration are 0.241, 0.145 and 0.105 respectively.

R-square value indicates only the variance in the organizational performance as it is explained by independent variables. When we look at the detail to what extent each independent variable influences the dependent variable: customer integration and internal integration were found to be determinant of organizational performance in decreasing order.

The coefficient table depicts that the significant regression coefficients, such as internal integration and customer integration are significant at $p < 0.05$. But, information integration and supplier

integration are not significant. This significance level tells us that those variables uniquely contribute to the regression equation thereby making a significant contribution to the prediction, but information integration and supplier integration doesn't. Since, coefficients of predictor variables are statistically significant at less than five percent for internal integration   and customer integration hypothesis related to these dimensions are accepted. Information integration and supplier integration not significant and as a result null hypothesis related to this dimension is failed to reject.

Table 4.17 Summary of the overall outcome of the research hypothesis

Hypothesis	Result	Reason
H0: Internal integration has no significant influence on the organizational Performance of DBCSH.	H0: Rejected	ß=0.241
H1: Internal integration has a significant influence on the operational Performance of the DBCSH	H1: Accepted	p<0.05
H0. Information integration has no significant influence on the Organizational performance of the DBCSH	H0: Accepted	ß=0.105
H1: Information integration has a significant influence on the organizational performance of the DBCSH	H1: Rejected	p>0.05
H0: Supplier integration has no significant influence on the organizational Performance of DBCSH.	H0: accepted	ß=0.145
H1: Supplier integration has a significant influence on the organizational Performance of the DBCSH	H1: rejected	p>0.05
H0. Customer integration has no significant influence on the organizational performance of the DBCSH.	H0: Rejected	ß=0.353
H1: Customer integration has a significant influence on the organizational Performance of the DBCS	H1: Accepted	p<0.05

CHAPTER FIVE

SUMMARY, CONCLUSION, RECOMMENDATION AND DIRECTION

FOR FUTURE RESEARCH

This chapter presents the summary of the data findings on effects of internal integration on Pharmaceutical supply chain performance of EPSA, besides conclusion and recommendation are drawn there to. The chapter is therefore structured into summary, conclusions, and recommendations and areas for further research.

5.1 Summary of Findings

The objective of the study was to determine the effect of pharmaceutical supply chain integration dimensions on Organization performance at DBCSH. Based on the objective, the major findings of the thesis are summarized as follows.

The thesis revealed that the overall level of pharmaceutical supply chain integration in the organization is low. The mean values of pharmaceutical supply chain integration dimensions showed that each dimension is implemented poorly. Internal integration is relatively implemented with higher degree (M=2.54) than the others. The other three dimensions of pharmaceutical supply chain integration (customer integration, information integration and supplier integration) have a mean of M=2.25, M=2.30 and M=2.24 respectively.

The association between variables was conducted using a Pearson correlation matrix. The result suggested that there is moderate positive association between independent variables and dependent variable with "r" value of internal integration(r=.648**)), information integration(r=.595**), supplier integration(r=.579**)) and customer integration(r= .669**) on organizational performance. Since there is a moderate relationship between independent variables the multicollinarity problem is reduced.

The final analysis was regression analysis and the result from regression analysis showed that some independent variables affect organizational performance significantly and others are not significantly. The result shows some independent variables (internal integration and customer integration) affect organizational performance positively with a beta value of (β= .353, sig= .001 and β= .241, sig= .040) and the other (supplier integration and information integration) not affect

organizational performance significantly with positive beta value (β= 0.145, sig= 0.146 and β=.105, sig=.350) respectively.

5.2 Conclusion

Under this study, the major determining factors of organizational performance identified were integrating variables of pharmaceutical supply chain based on the response of employees which composed of four dimensions; internal integration, information integration, supplier integration, and customer integration. Four research questions were developed and addressed in this research and unfortunately all the dimensions were rated below the average mean value of 2.5. In other words, it shows the poor existence of pharmaceutical supply chain integration in the DBCSH.

The first dimension which is over sought by DBCSH is internal integration. The items here are; the integration of data among internal functions, use of cross functional teams in process improvement, enterprise application integration in internal function, strong integrative inventory management, real time searching inventory and utilization of periodic interdepartmental meeting. This implies that the employees need an improvement along the internal activities of the debre birhan hospital.

Information integration which composed of the issues like; free sharing of accurate information along the line of supply chain, the timely sharing of information with members of supply chain, strong coordination on the flow of information among supply chain partners and the strong utilization of information among supply chain partners are vital points ignored by the hospital.

Supplier integration and organizational performance are positively but not significantly related. The exchange of information with supplier through information network, quick ordering system, creation of good strategic partnership with supplier and the stability of procurement with supplier are critical issues which are neglected by the hospital.

Customer integration was another dimension which is deprived by the debre birhan hospital. Its attribute included; linkage with customer through information network, the computerization of services for customer ordering, use of effective communication with major customer, the establishments of quick ordering system with customer, follow up with major customer for feedback and the frequency of contacts with supplier

The results given on the conclusion entails us that the four research questions developed in this study were considerably rated low by the employees which actually indicates the pharmaceutical supply chain integration is not at the required level of its employees.

According to the correlation, it is possible to conclude that there is a strong and positive relationship among the four pharmaceutical supply chain integration dimensions which this study was relied on the organizational performance of debre-birhan hospital.

5.3 Recommendation

As the result of the study indicated the pharmaceutical supply chain integration dimensions can significantly affect organizational performance of DBCSH. So in order to alleviate the problem of pharmaceutical supply chain integration in DBCSH the researcher recommends the following points:

Internal integration within the organization is a primary activity in any organization or firms. The debre-birhan hospital should have to give a critical emphasis on alignment among departments through better data integration & creating continuous interdepartmental contact among internal functions in the perspectives of pharmaceutical supply chain.

Information integration can be improved through utilization of IT tools for information access, timely sharing of information across the member of supply chain, strong coordination in the flow of information, and preparing strong information sharing strategy.

In order to improve the supplier integration, the hospital needs to create a long-term strategic supplier relationship for strategic items. So the organization should first classify effectively the medicine and medical supply being procured based on strategic significance, then it should create long supplier relationship for items which have high value and high importance in the organization or right pharmaceutical with the right suppliers.

Without the integration of customer into the hospital it is impossible to give proper and quality service. Linking the customer through information network with the company to get feedback from the customer and creating an access of computerization for customer ordering is crucial factors while considering the integration of customer.

As the thesis result indicates, overall DBCSH have a lot of works on Pharmaceutical supply chain integration to improve its organizational performance.

5.4 Areas for Future Research

- ❖ A study that will assess the challenges affecting pharmaceutical supply chain integration in their organizational performance of DBCSH. This study will expose the challenges that need to be addressed for improved operational performance the organization.

- ❖ Future researches should also conduct a study that will assess the barriers on the implementation of pharmaceutical supply chain integration strategies in wholesaler and retailer of pharmaceutical. Such study will have a significant contribution in helping managers to identify areas within such businesses that require a critical attention in order to increase the performance of organization and pharmaceutical integration in debre birhan hospital.

- ❖ Furthermore, I recommend researchers to undertake a comparative analysis on the effect of Pharmaceutical supply chain integration on their organizational performance with other firms that organization performance could be tested, in order to assess their significance.

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Appendix

Appendix I; Consent form

Debre Birhan University School of Business and Economics

Department of Logistics and Supply Chain Management

Dears,

My name is Eshetu Mengistu conducting a study on the effect of pharmaceutical supply chain integration on organizational performance the case of debre birhan comprehensive specialized hospital for the partial fulfillment of master's degree in logistics and supply chain management in Debre Birhan University, School of Business and Economics. I would like to extend my deep appreciation to your organization and you for the willingness and cooperation in undertaking this valuable research. Taking part in this study you will contribute towards alleviating the problem of pharmaceutical supply chain 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.

If you have any question, you can contact me through the following my personal addresses. I would like to appreciate and thank you in advance for your dedication, time and genuine response to the questions.

Eshetu Mengistu

Cell Phone: +251 912354049Email: eshetumengistu05@gmail.com

Appendix 2 – Questionnaire on measuring knowledge of pharmaceutical supply chain integration on Organizational Performance.

Questionnaire No:_____   Date: _____

Part I: General Information and Demographic Background of Respondents in the Selected Samples of Departments.

1.1. Gender

    1. Male   2. Female

1.2. Age

    1. Less than 25 Years   2. 26-34 Years   3. 35-44 Year

    4. 45-54 Years   5. Over 54Years

1.3. Educational

    1. Diploma   2.BA/BSC Degree

    3. MSc/ MA   4. Doctorate degree   5. Other Specify _____

1.4. Profession of in-charge

    1. Nurse   2. Pharmacist   3.Laboratory technology   4. Biomedical Engineer

    5. Radiologist   6.Doctor

    7 Other Specify _____

1.5. How many years have you been employed in D/B/C/S/Hospital?

    1.1-5 Years   2.6-10 Years

    3. 11-15 Years   4. Over 15 Years

1.6 Kindly, Indicate the Department that you are working in.

    1. Pharmacy   2. Inpatient   3.x-ray   4.TB/Leprosy

    5. Laboratory   6.Emergency OPD   7.Outpatient   8.others-----------

PART II

The following statements relate to the effect of pharmaceutical supply chain integration on organizational performance in case of Debre Birhan Comprehensive Specialized Hospital. Follow the instructions given for your responses please set by tick (√)

	Please indicate the extent of pharmaceutical supply chain integration of your organization. (1=stronglydisagree;2=disagree;3=neutral ;4=agree;5=strongly agree)	1	2	3	4	5
1	**Internal integration**					
A	There is better Data integration among internal functions					
B	There is Enterprise application integration among internal functions					
C	There is strong Integrative inventory management					
D	Real time searching of the level of inventory					
E	Utilizing periodic interdepartmental meeting among internal functions					
F	Use of cross functional teams in process improvement					
2	information integration					
A	There is high level of free sharing of accurate information across members of supply chain					
B	Timely sharing of information across the members of supply chain					
C	Strong coordination in the flow of information among partners					
D	There is strong utilization of information among supply chain partners					
E	Common Computerized data base system available					

	in the organization					
3	**Supplier integration**					
A	There is strong information exchange with major supplier through information network.					
B	There is quick ordering system with major supplier					
C	There is strong strategic partnership with major supplier					
D	There is stable procurement through network with major supplier					
4	**Customer integration**					
A	There is linkage with customer through information network					
B	Computerized system for major customer ordering					
C	Use of effective communication with major customer					
D	Establishment of quick ordering system with major customer					
E	There is follow up with major customer for feedback					
F	High frequency of period contacts with major supplier					
	Organizational Performance concerning your company's performance with respect to your customer.					
A	There is quick response by the company to changes in clients need and cases					
B	On-time delivery record to customers by the company					

C	The company provides cost effective service to customer					
D	The lead time for fulfilling customer's orders (the time which elapses between the receipt of customer's order and the delivery of goods) is short					
E	The organization can quickly modify the pharmaceutical supply chain process to meet customer's requirements.					
F	The organization provides a high level of customer service					
g	The organization provide better quality of service					

THANK YOU!!!

Appendix III: Multiple Regression Assumption Test results

Multi Collinearity test:

Model		Collinearity Statistics	
		Tolerance	VIF
1,	(Constant)		
	Internal integration	.361	2.769
	Information integration	.391	2.556
	Supplier integration	.499	2.005
	Customer integration	.477	2.097

ANOVAa

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	1591.876	4	397.969	27.716	.000[b]
1	Residual	1364.084	95	14.359		
	Total	2955.960	99			

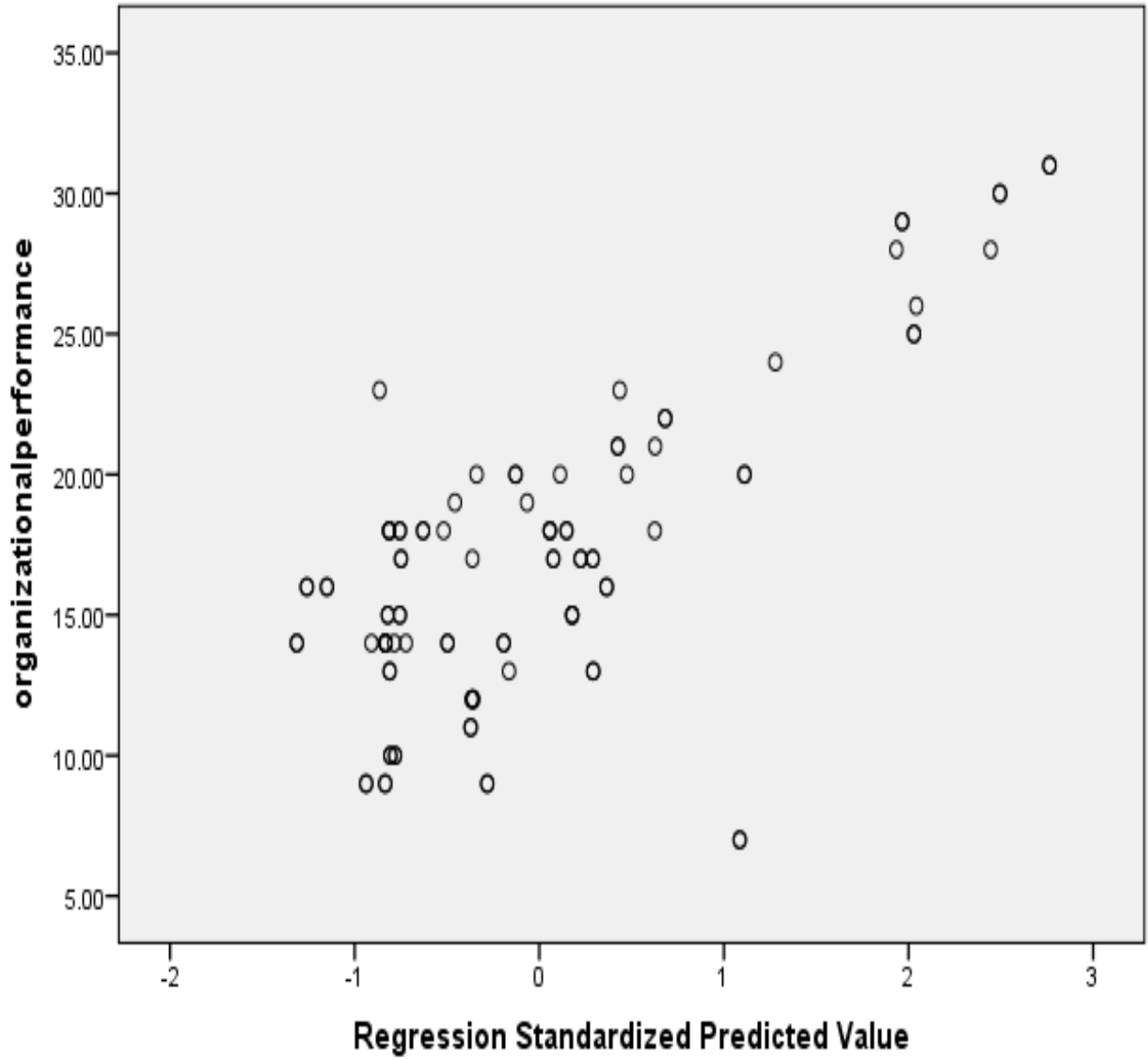a. Dependent Variable: organizational performance

b. Predictors: (Constant), customer integration, supplier integration, information integration, internal integration

Model Summary:

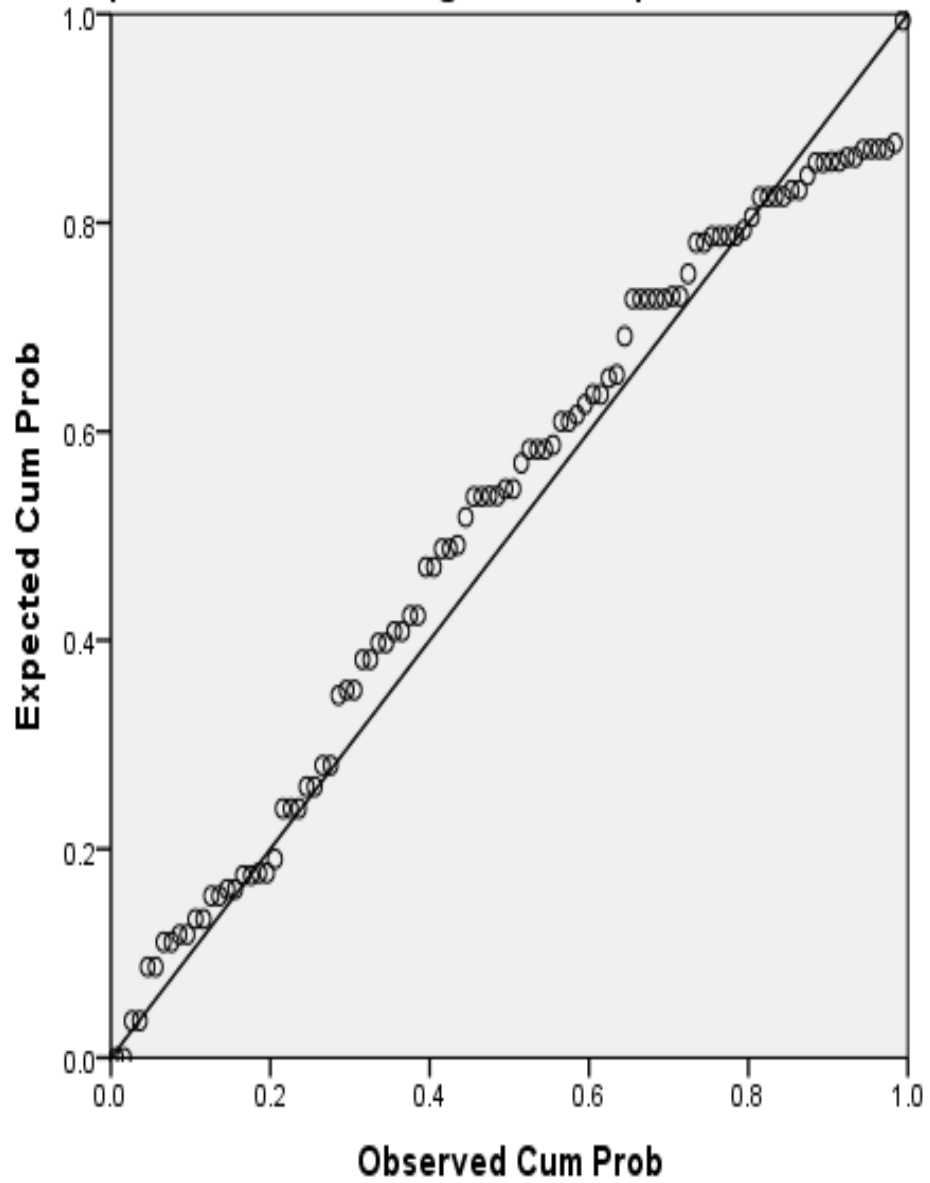| Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.734[a]	.539	.519	3.78930	2.219

Scatterplot

Dependent Variable: organizationalperformance

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: organizationalperformance

Histogram

Dependent Variable: organizationalperformance

Mean = 2.71E-16
Std. Dev. = 0.980
N = 100