ROLE OF SUPPLIER DEVELOPMENT ON THE IMPROVEMENT OF HOSPITALS' PHARMACEUTICAL SUPPLY CHAIN PERFORMANCE IN ADDIS ABABA, ETHIOPIA.

BY

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A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF ARTS IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT

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Declaration

I, the under signed, declare that this thesis entitled "ROLE OF SUPPLIER DEVELOPMENT ON THE IMPROVEMENT OF HOSPITALS' PHARMACEUTICAL SUPPLY CHAIN PERFORMANCE IN ADDIS ABABA, ETHIOPIA", is my original work and to the best of my knowledge it has not been presented for a degree by any other person, and that all the sources of material used for the thesis have been duly acknowledged.

Declared by:

Abiot Abebe

_____

Date & Signature

Statement of Certification

This is to certify that Abiot Abebe has carried out his thesis work on the topic entitled 'Role of supplier development on the improvement of hospitals' pharmaceutical supply chain performance in ADDIS ABABA, ETHIOPIA was 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's of Arts in Logistics and Supply Chain Management.

Dr. Temesgen Belayneh Zerihun (Assistant Professor) (PHD, MBA, MA)

Signature_____

Date_____

Dedication

I would like to dedicate this work to my respected wife, Emebet Mitiku, for her support and encouragement throughout this work.

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Acknowledgement

I want to gratify the Almighty God for His Mercy and Grace for giving me this chance of academic advancement. I would like to express my deepest gratitude to my advisor Dr. Temesgen Belayneh (Ass.Prof) for his goodwill, support and guidance throughout the research. I would also give a special thanks to pharmacists who were responding the questionnaire.

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Table of Contents

List of tables

List of acronyms

AVE:	Average variance extracted
EM:	Essential medicine
EPSA:	Pharmaceuticals supply agency
IE	Information exchange
PPS:	Private pharmaceutical supplier
PSCP:	Pharmaceuticals supply chain performance
SCM:	Supply chain management
SCP:	Supply chain performance
SD:	Supplier development
SDA:	Supplier development activities
SDD:	Supplier development dimension
SI	Supplier incentive
SPSS:	Statistical Product and Service Solution
TS	Technical support
WHO:	World health organization

Abstract

Emerging trend has suggested that Supplier Development could serve as a more modern tool to improve supply chain performance. The purpose of this study was to analyze the role of supplier development on the improvement of pharmaceuticals supply chain performance in government hospitals of Addis Ababa, Ethiopia. The specific objectives were to: ascertain whether supplier incentive has a statistically significant positive relationship with performance in pharmaceuticals supply chain, determine whether technical support has a statistically significant positive relationship with performance in pharmaceuticals supply chain, evaluate whether information exchange has a statistically significant positive relationship with performance in pharmaceuticals supply chain and determine the extent of supplier development among government hospitals. Primary data was collected by means of a well-structured questionnaire and the data collected were analyzed using the Statistical Product and Service Solution (SPSS version 23.). Methodologically, descriptive survey research design of the quantitative approach was employed. A total of 84 managerial level pharmacists from all government hospitals found in Addis Ababa, Ethiopia were selected based on purposive sampling technique to respond to the questionnaire. Retrieved data were statistically tested using descriptive statistics (including percentage, mean and standard deviation) and inferential statistics (bivariate correlation, simple linear regression methods). The descriptive statistics showed that the extent of supplier development dimension in the government hospital of Addis Ababa, Ethiopia was low. The bivariate correlation analysis revealed that both supplier incentive, technical support and information exchange has a positive relationship with pharmaceuticals supply chain performance. The simple linear regression analysis confirmed that supplier incentives, technical support and information exchange has statistically significant effect on the improvement of pharmaceuticals supply chain performance. Therefore government hospitals should implement supplier development practices to improve their pharmaceutical supply chain performance in terms of pharmaceuticals availability and minimizing cost due to pharmaceuticals expiration and emergency purchase.

Key words: essential medicine, pharmaceuticals, supply chain performance, supplier development

Chapter One

1.1 Introduction

This chapter is going to address back ground of the study, statement of the problem, objective of the study, theoretical and conceptual definition, significance of the study, scope of the study, limitation of the study, and finally gives organization of the study.

1.2 Back ground of the study

Buyer supplier relationship has a determinant effect on the supply chain performance (Amit Kumar Marwah, Girish Thakar & R.C. Guptathough (2014) and according to Veronica S. Ülgen, (2017), supplier development is one of the activities that can strengthen the buyer supplier relationship.

Supplier development (SD) is the process of working with certain suppliers on a one-to-one basis to improve their performance and capabilities for the benefit of the buying organization and can take the form of a one-off project or an on-going activity that may take some years to come to fruition (Scott, 2012).

Supplier development is a particular aspect of supply chain management (Giunipero et al., 2008, Rajput and Bakar, 2012). Firms are utilizing supplier development practices for the consistent supply base that can improve buyer-supplier performance (Humphreys et al., 2011).

SD plays an important role in improving the performance of a supply chain that contributes to the overall efficiency of the organization, thereby reducing material costs and bringing greater

efficiency throughout the supply chain. There is therefore a growing interest in SD these days (Li et al, 2012).

Supply chain performance is the ability to meet the end customer needs such as ensuring product availability, timely delivery and ensuring proper inventory standards (Hausman 2004). The advantage of a supply chain occurs when a company acquires or develops a combination of factors that allow it to become a competitive advantage that helps it succeed its competitors (Christensen & Fahey, 2004).

Rajput and Abu Bakar, (2012) have suggested that supply chain performance may be improved in line with supplier development.. Therefore this study focused to analyze what role developing suppliers' performance through different activities has on the performance of pharmaceuticals supply chain.

1.3. Statement of problem

Since Medications are vital components in the care of patient worldwide and access to health care including essential medicines (EM) is a fundamental human right, WHO recommends the availability of essential medicines to be 100% (Kefale et, al., 2019). However, in Ethiopia the availability of essential medicines were 70% which were under the requirement of WHO recommendation as the national survey done by Carraso et, al., (2009) and a systematic review made by Tewuhibo D , Asmamaw G and Ayenew W (2017) indicated. A low level of pharmaceutical availability in the health care is a manifestation of poor pharmaceuticals supply chain performance (MSH, 2005).

To close supply chain performance gap, Handfield (2002) advised initiation of SD activities and pertinent literatures acknowledge the significance of supplier development. For instance Wachiuri, Waiganjo and Oballah (2015) find out that supplier development has a great role on the organization performance. The investigation made by Yegon, Kosgei and Lagat (2015) indicates the positive effect of supplier development on the buyer performance. Lukhoba and Muturi (2015) revealed the positive effect of supplier development on the performance of supplier. According to Ochieng (2014), supplier development had a very good impact on the procurement function. The assessment made by Thuita, G. et al., (2018) on the effects of technical support to suppliers on supply chain performance in the dairy sector in Nyandarua County indicates that technical support to suppliers had a positive and statistically significant effect on supply chain performance in the dairy sector in Nyandarua.

The above studies indicate that procurement performance, organization performance, buyer performance, supplier performance and the supply chain performance in the diary sector has been improved by supplier development. However, there is a gap in the current research on understanding the role of supplier development specifically on the performance of pharmaceuticals supply chain. For this reason, this study focused to analyze the role of supplier development on the improvement of hospitals' pharmaceuticals supply chain performance.

1.4. Objective of the study

1.4.1. General Objective

To analyze the role of supplier development on the performance of pharmaceuticals supply chain

1.4.2. Specific Objective

1- To ascertain whether supplier incentive has a statistically significant effect on the performance of pharmaceuticals supply chain

2- To determine whether technical support has a statistically significant effect on the performance of pharmaceuticals supply chain

3- To evaluate whether information exchange has a statistically significant effect on the performance of pharmaceuticals supply chain.

4- To determine the extent of supplier development practice among government hospitals

1.5. Definition of terms

1.5.1. Theoretical Definition

1.5.1.1. Pharmaceuticals

The term drug, medicine and pharmaceuticals that can be used interchangeably referred to as any substance or mixture of substances manufactured, sold, offered for sale or represented for use in the diagnosis, treatment, mitigation or prevention of disease, abnormal physical state or the symptoms thereof in man (WHO, 2007).

1.5.1.2. Essential Medicine

Essential medicines are those medicines that satisfy the priority healthcare needs of the population (WHO, 2017).

1.5.1.3. Supply chain Performance

Supply chain performance refers to the extended supply chain's activities in meeting end-customer requirements, including product availability, on-time delivery, and all the necessary inventory and capability in the supplier chain to deliver that performance in a responsive and flexible manner (Hausman W.H, 2004).

1.5.1.4. Supplier Development

Any effort of a buying firm with a supplier to increase its performance and/or capabilities and meet the buying firm's short and/or long-term supply needs (Krause and Ellram 1997a; b).

1.6. Significance of the study

Since medicines are vital components of patient care all over the world, WHO recommend that the availability of essential medicines at health care facilities to be 100 percent. The availability of medicines and other supplies often depends on how well or how poorly the supply chain is performing (USAID, 2010). Hence improving pharmaceuticals supply chain performance plays a significant role on the availability of medicine. The role of developing pharmaceutical suppliers' performance to improve hospital's PSC has not been studied yet and hence this study analyze the role of applying supplier development practice on the performance of pharmaceuticals supply chain. Therefore the result obtained from the research and the recommendations given has a significant practical contribution for decision makers to improve the performance of pharmaceuticals supply chain if the alternate hypothesis is accepted. In addition this study used

as a base for further investigation and encourage other researchers to conduct similar studies on the subjects under investigation.

1.7. Scope of the study

The supplier-development practices can be said to be either indirect or direct in regard to the buyer's involvement and resource commitment to the supplier's development. This research will be used Indirect supplier development activities such as technical support, incentives and information exchange as independent variables for the reason that direct SD activities need intensive buyer's involvement and resource commitment which are difficult for government hospitals to implement.

This study aimed to assess the view of pharmacists about the role of supplier development practices such as supplier incentives, technical support, and information exchange on the performance of pharmaceuticals supply chain. It excludes the view of procurement and finance departments as well as the view of top managements though they have enormous information about the topic under study

Because of budget and time constraints, this study covers only governmental hospitals that are found in Addis Ababa, Ethiopia

Though government hospitals can acquire pharmaceuticals either from governmental supplier such as Ethiopian Pharmaceuticals Supply Agency (EPSA) and/or from private sectors such as private pharmaceuticals importers and whole sellers, however, this study focused on the assessment of the role of developing private pharmaceuticals suppliers (importers and whole sellers) on the performance of pharmaceuticals supply chain.

1.8. Organization of the paper

To introduce and develop the arguments summarized here in detail, the proposal comprises the five chapters. These chapters are constituted as follows:

Chapter -1 Introduction: In the first chapter all introductory parts of the study like background of the study, problem statement, research hypothesis, objective of the study, conceptual frame work, significant of the study, delimitation and limitation of the study, as well as conceptual definitions are included.

Chapter -2 Literature review: The second chapter of the study comprises the theoretical and empirical framework about supplier development practice and the supply chain performance, which is a compilation of other author‘s journals and articles, literature. This section also includes a review of various empirical studies that have been made on the effect of supplier development practice on the buyers’ performance.

Chapter -3 Research methodologies: The methodology part of the proposal represents the processes to mapping out the study area, research approach and design, target Population, sampling technique, the type and sources of data, data collection procedure, methods of data analysis and ethical consideration.

Chapter- 4 Result and Discussion: The analysis and presentation of the results and corresponding discussions is presented under chapter four.

Chapter- 5 Summary of Findings, Conclusions and Recommendations: the conclusions drawn from the research findings and recommendations based on the findings are presented under chapter five.

Chapter Two: Literature Review

1.1 Introduction

This chapter presents literature in line with the objectives of the study which presents the detailed information about supplier development and supply chain performance. The literature was retrieved from research journals, articles together and text books. The aim was to evaluate the views of other researcher and scholars in regard to the study problem and hence being able to make the summary

2.2. Supply Chain Management definitions

Supply chain management (SCM) has nowadays become a crucial strategy for firms to enhance their profitability and stay competitive. Thus, SCM has been recognized as an important phenomenon that has generated extensive interest among managers and academic researchers. Thus, over the last decade, scholars have increased the degree of attention paid to SCM.

Since there are many definitions of the SCM concept in the literature there is no generally accepted definition of SCM in the literature. SCM definitions are classified into three categories: integrated logistics management, purchasing and supply management, and integrated SCM. For this research, SCM defined as is a process of integrating/utilising and co-ordinating products and information flows among suppliers, manufacturers, distributors, retailers and customers, so goods should be produced and delivered at the right quantities, at the right time, and at the lowest cost, whilst satisfying customer requirements (Moh'd Anwer Radwan Al-Shboul et al., 2017).

SCM includes plans, executes, manages and controls all activities involved in the management of sourcing, procurement, distribution and logistics with the aim of satisfying the end users as efficiently as possible. Importantly, it also involves coordination and collaboration with mid-level partners who act as a link to the end users. (Bylas et al., 2014).

2.3. Pharmaceuticals Supply Chain Management

Many players are involved in providing health care: (1) payers (e.g., government, employers and individuals); (2) health care providers (e.g., physicians, hospitals, pharmacies, and integrated distribution networks); (3) manufacturers of health care products (e.g., pharmaceutical manufacturers, manufacturers of medical devices and equipment); (4) insurance companies (e.g., health care exchange, health management companies and preferred provider companies); (5) Channel intermediaries (e.g., distributors, wholesalers). Having so many players in the healthcare sector means that there is a high potential for conflict, miscommunication, overlap and fragmentation leading to inefficiencies and thus low customer value (i.e., low-quality but expensive health care) delivery. To avoid these inefficiencies, we must adopt the idea of supply chain management, which can help us break down the hidden barriers between different health care players and restore their conflicting interests (Hokey, 2014).

Health supply management is critical to the success of almost all health care organizations because they all rely on pharmaceuticals, medical supplies, ingredients and medical equipment. Health commodities management is an aspect of the bigger picture of commodities management. The goal of a health supply management system is far greater than making sure a product goes where it belongs. Ultimately, the goal of every public health logistics system is to help ensure the safety of goods for every consumer. A properly functioning supply chain is an

important part of ensuring the safety of goods – funding, policies and commitment are also required. Effective supply chains not only help ensure the safety of goods, but also help determine the success or failure of any public health program. In both business and the public sector, logistics reforms bring significant benefits (Kumurya, 2015).

Raeeda and collegues assessed the effect of Supply Chain Management and Its Effect on Health Care Service Quality and found that a high performing supply chain management has significant effect of supply chain management dimensions (the relationship with suppliers, specifications and standards, and delivery, after-sales service) on the quality of health services (Raeeda et al, 2013). Effective health commodities management has a great impact on the efficiency and effectiveness of the service delivery of health facilities (Emelia et al, 2014).

2.4. Supply Chain Performance

The effectiveness of a supply chain is defined as the ability of a supply chain to deliver the right product in the right place at the right time at the lowest cost of logistics (Zhang, Okorofo 2015). Supply chain performance is the ability to meet the end customer needs (of the entire supply chain) related to ensuring product availability, timely delivery, and ensuring appropriate inventory standards. (Houseman 2004).

Various studies have suggested and used a set of measures to respond to current requirements for SCP. Stevens (1990) provides SCP measurements in terms of service level, cost, output capacity, inventory level and supplier performance; On the other hand, according to Pitiglio and Todd (1994) SCP activities fall into one of four categories: customer satisfaction / quality, cost, time and assets. Speckman et al. (1998) used customer satisfaction and cost reduction as a measure of

SCP. Beaman (1999) recognizes qualitative SCP practices such as flexibility, information and material flow integration, customer satisfaction, supplier performance and effective risk management. Carvalho, Azevedo (2012) describes two aspects of supply chain performance: operational aspects – including quality, delivery, time / response, flexibility cycles, efficiency and inventory levels – and financial aspects – including finance cash to cash cycle, value added,

Various studies have proposed and implemented a set of response measures to current SCP requirements. Stevens (1990) provides SCP ratings in terms of service level, cost, output capacity, level of innovation and service providers; On the other hand, according to Pitiglio and Todd (1994), SCP's activities fall into one of four categories: customer satisfaction / quality, cost, time and assets. Speckman et al. (1998) used customer satisfaction and cost reduction as the SCP measure. Beaman (1999) recognizes high-level SCP processes such as flexibility, knowledge and integration of flow, customer satisfaction, operator performance and effective risk management. Carvalho, Azevedo (2012) describes two aspects of supply chain performance: operational aspects - including quality, delivery, time / response, flexibility cycles, efficiency and inventory levels - and financial features - including cash flow in the cash cycle, value added cost over assets and revenue. According to Zokaei and Simmons (2006), supply chain performance can be divided into two categories: efficiency and efficiency. In practice it is not possible to consider all aspects of SCP found in educational textbooks. As suggested by Zokaei and Simmons (2006) the effectiveness and efficiency of supply chain performance measures were altered in this study and according to MSH (2005), the effectiveness of the drug supply chain has been evaluated in terms of efficiency and effectiveness. To evaluate the efficiency and effectiveness of supply chain use metrics related to various performance objectives such as cost, quality, reaction, flexibility, delivery, product availability and more (Webster, 2002). This study

therefore focused on supply chain performance in relation to dependent quality and cost variations.

2.4.1. Quality

The meaning of the word quality is extended to include many scales and litratures cited for eight quality scales. These are performance, features, reliability, consistency, durability, efficiency, accuracy, and visual quality (Aron Chibba, 2007).The performance dimension of quality which is described as Primary operating characteristic of a healthcare supply chain is the focus point of this research.

According to Smith B.K (2011), one of the key factors influencing the quality of a series of health care delivery is product availability. Product availability is the continuous availability of the desired or selected product at the required price in the areas where it should be available.

Performance appraisal system often raises questions about the availability of essential medicines at institutional level as a measure of quality of care. Indeed, it is widely recognized that the ability of health care systems to cope with many of today's health problems depends largely on the availability of these products, and that people will seek care when available (MSH, 2005). Stock depletion, demand variability and expiration may affect product availability (USAID, 2012).

2.4.2. Cost

Cost is the value of money that has been used to carry out an event or an activity. Cost is always one of the indispensable aspects in assessing the performance. This dimension records

inputs consumed and also reflects the effectiveness of cost control. It is very important performance dimension as financial resources are used to carry out various activities within the scope of SCM (Aron Chibba, 2007). Out of the costs pharmaceutical supply chain faced are cost due to shortage of pharmaceuticals and pharmaceuticals expiration. Pharmaceutical shortage leads to expenditures on emergency purchase (MSH, 2005).

2.5. Resource Based Theory

Resource dependence theory suggests that organizations need resources to survive, whereas “no organization is completely self-sufficient” (Pfeffer & Salansik 1978). The basic premise of resource dependence theory is that the organization's critical service acquisition and external resource management management determines its existence. Companies that do not have the necessary resources seek relationships with others to get the resources they need. The organization's need for critical services creates the trust of partners to manage resources (Gundlach & Cadotte 1994; Kibling, Bize & Weale 2013).

The organization chooses its interfaith administration as a response to strategy based on critical resources (Pfeffer & Salansik 1978). The value of a service stems from its scarcity or uncertain availability in an area that limits the access to the required resource organization when any other or other organizations do not provide that service (Cassiero & Piskorsky 2005; Baxter 2008).

Casciaro and Piskorski (2005) suggested that, in order to build long-term relationships, exchange partners should build trust with each other and reduce differences in their levels of dependence on the exchange of essential resources. That is, when one group relies heavily on its partner, both partners should consider minimizing differences in their dependence levels. In recent years, there has been a trend where firms tend to increase their reliance on one partner and build relationships between organizations, especially in the manufacturing industry where corporate relationships with their customers and suppliers have changed naturally from competition to partnership.

According to resource dependency theory, organizations need to build relationships that are dependent on other service providers in order to access the critical resources that they can access in their organization. Collaborative relationships, shared action and high quality information are expected to increase reliance on their partners. Reliance between organizations facilitates long-term commitment.

2.6. Concepts of Supplier Development

Leander (1966) first introduced the concept of supplier development, demonstrating the commitment of manufacturers to increase the number of suppliers with the aim of doing better within the organization (Quram et al., 2016). Provider Development refers to an organization's efforts to build and maintain friendly relationships with competent suppliers. According to Wenley et al (2012), manufacturers develop close relationships with their suppliers because customer-supplier relationships are associated with much lower costs, lower lead times, increased productivity and increased quality. Supplier development is a form of cooperation between the buyer and the supplier who wants to constantly improve the performance of the supplier and, at the same time, strengthen the competitive advantage of the competitor.

2.7. Supplier development definition

The provider development work is based on three widely used definitions.

2.7.1. Watts & Hahn's definition

Watts & Hahn's first definition (1993) refers to supplier development as "A long-term collaborative effort between the consumer and his suppliers to improve supplier skills, quality,

delivery and cost and to promote continuous improvement. This definition is about long-term commitment and the relationship between supplier and buyer. Improvements from the supplier side will make the supplier more efficient and efficient and will provide an additional competitive advantage to the consumer to become more competitive. This definition did not explicitly state that supplier development strategies need to be supported by both consumer and their supplier Joshoshi sarang P et al., (2012).

2.7.2. Krause and Ellram definition

The second definition of Krause and Ellram (1997a) defines supplier development as "any attempt by the purchasing company and its suppliers to maximize the performance and / or capacity of the supplier and meet the supply needs of the purchasing firms." Here Krause and Ellram realize that supplier development is aimed at helping a supplier improve their performance and / or skills as a result of a purchasing company. But here they did not say about the time that is, it must be long or short or aimed at Jososhi Sarang P et al., (2012).

2.7.3. Wanger S.M definition

The third definition defines supplier development as "Any transaction that the consumer undertakes to improve supplier performance and capabilities to meet the short- or long-term customer supply needs of Wanger S.M. (2006).

2.8. Supplier development Program

The provider development program primarily has two purposes. Firstly to alleviate supplier problems by making rapid changes in supplier performance and secondly to try to increase supplier capacity in such a way that the supplier will be able to improve its own (Joshi sarang P et al., (2012). Supplier development programs are either process-oriented or result- oriented.

2.8.1. Result – oriented and process – oriented supplier development program

2.8.1.1. Result – oriented supplier development program

Many supplier development programs focus on result –oriented program and focus on solving specific provider issues. These result-oriented programs will improve the quality and cost of their providers. Result-oriented supplier development increases the performance of supplier but not helps suppliers to increase their capabilities for continues improvements. The result-oriented system has certain advantages such as faster proven implementation, faster problem identification and faster solution that will give the customer team a richer experience of solving consecutive supplier problems but with the disadvantages of less supportive side, limited transfer of ongoing process information to providers with fewer improvements.

2.8.1.2. Process – oriented supplier development program

Process-focused program helps providers increase their capacity for continuous development (Joshi sarang P et al., (2012). Manufacturing firms mainly focuses on supplier development activities requiring little or no involvement from the buyer side except its substantial reliance on its suppliers. Buyers are interested in short term result oriented approaches in product quality, delivery and cost reduction Che et al., (2008).

2.8.2. Direct and Indirect supplier development program

Wanger (2010) categorized the provider development program with a direct and indirect program development provider. He found that indirect supplier development improves supplier productivity and delivery performance and that direct supplier development enhances supplier capacity. In indirect supplier development, the purchasing company uses the connectivity and strength of the external market to achieve performance enhancement on the supplier side where as in the direct supplier development program the purchasing role plays a significant role and provides human and financial services to a specific supplier to solve relevant problems. Direct supplier development includes the transfer of knowledge and qualifications to a supplier organization. Examples of such activities are on-site consultation, education and training programs, the transfer of temporary staff and inviting provider staff.

2.9. Supplier Development Activities

Sanchez et al., (2005) classified supplier development activities into three parts on the basis of buyer's resource involvement parameters like personnel, capital and time Basic supplier upgrades - this will deal with supplier testing and accountability. Supplier eligibility is more important than obtaining a supplier certificate. The supplier base will be small in number and standard components as well as a growing business volume with limited suppliers. Supplier performance testing and feedback, availability of a limited number of providers, component configuration and supplier suitability are integrated under the basic provider development tasks (Sanchez et al., 2005). Medium supplier development - the term itself means consumer engagement is of a moderate nature. This mainly included activities such as rewarding and seeing supplier performance, visiting the supplier industry to providers to resolve their problems,

making suppliers successful in resource-based issues (collaborating with suppliers in material development) and provider certificates (Sanchez et al., 2005). Improved supplier development - in this case consumer engagement is more in terms of the terms that can be used above (money, time and staff). It includes appropriate training for the provider, which includes providers in the design and development of new products, sharing information such as costs, quality and financial data (in-depth information sharing with suppliers) (Sanchez et al., 2005).

Formal supplier inspection, verification, recognition, illegal supplier inspection, supplier site visit, training, and visit customer base and resources, as well as oral or written need for performance improvement are cited as a factor of direct involvement in supplier development by Sundram, etc. al. (2015). According to Job (2015), the provider training program, provider evaluation and evaluation, certification / qualification, financial support, provider auditing, and providing incentive and recognition are considered supportive development strategies. Ochieng (2014) also ensures that supplier development strategies include provider engagement, customer liaison, information exchange and understanding of providers goals, feedback, site visits, provider recognition and training and education. This study will be used for nonprofit development activities such as technical support, compensation and information exchange as independent flexibility due to the fact that direct SD operations require deep customer involvement and commitment to resources that public hospitals can use.

2.9.1. Incentives

Supplier incentives are a strategy that encourages providers to improve their performance which includes promises of higher order assets and business considerations for the future as it improves its performance, sharing cost savings achieved through performance improvements, and

monitoring supplier and certification development (Giunipero 1990; Krause 1997; Krause; Scannell & Calantone 2000; Modi & Mabert 2007). Incentives may also be monetary, non-monetary or hybrid, Source: www.dau.edu. Provider motivations are the main motivation for providers to improve their performance and build strong and lasting relationships. If compensation is not provided and issued, providers are unwilling or reluctant to comply with building long-term relationships with purchasing firms. The literature suggests that supportive incentives may enhance the opportunities and will of suppliers and satisfaction to meet the needs of consumers (Ghijsen, Semeijn, & Ernstson, 2010).

2.9.2. Technical support

Technical support allows providers to deliver on time, improving quality, reliability (Langfield & Greenwood, 1998). In addition, when a purchasing company provides technical support to suppliers, the operational size of the purchasing company will improve in terms of cost, quality, production, and design (Lee & Ansari, 2005). Provider development leads to reduced costs, improved communication, risk sharing, and improved problem solving (Quayle, 2000).

Rytter, Boer and Koch (2007) argue that, activities related to the provision of technical assistance are essential to the performance of providers. A study by Carr and Pearson, (1999), predicted the existence of a positive relationship between technical support and customer performance. This is because as the supplier uses the acquired technical ability, it translates into product innovation and product quality. This leads to the provision of quality products by suppliers, which in turn improves efficiency and effectiveness on the consumer side.

Services related to the provision of technical assistance are essential to the performance of providers. This technical support may include direct investment of equipment and staff providers, supplier performance evaluation and sharing feedback on test results, visitation of supplier plants (Moses, 2015).

The first step for SD is a provider test that identifies areas where improvement is needed. This step helps to identify the real cause of the problem i.e. whether the problem is in the visual state either in the structure or in the production or drawing (Hartley & Choi, 2007). Providers are evaluated on the basis of parameters such as technical skills, quality, cost, delivery, management capacity (Hartley & Choi, 2007).

Wagner (2006) considered provider evaluation and communication about supplier outcomes as basic activities for provider development. Prahinski and Benton (2004) considered evaluating supplier performance, comparing supplier performance with expected performance and improving provider planning as major provider development tasks. Providers are evaluated by customers based on their performance. Providers are basically evaluated on the basis of parameters such as technical skills, quality, cost, delivery, management skills (Purdy, Astad & Safayeni 1994).

2.9.3. Information Exchange

The chains of supply chain assets are based on the ability to make strategic decisions quickly and quickly respond to changes in demand and supply. In a dynamic business environment knowledge becomes an integral part of making supply chains more effective. The inevitable need for supply chain capabilities to tailor product production according to customer and market needs

plays an important role in regulating relationships with suppliers. The information therefore brings suppliers, distributors and transport providers to meet the organization's goals for networking supplier network (Arpita Khare).

Many researchers provide evidence that sharing information such as order, demand and innovation can improve the effectiveness of supply chain and firms. For example, Lin et al. (2002) found, by simulation study, that with more detailed information shared between firms, the result was a significant reduction in the total cost of supply chain.

The sharing of customer information is the level at which the consumer freely shares information with the supplier (Paulraj etal., 2008). Consumers who share information with suppliers can help their providers better see the benefits of supplier development processes, improving the efficiency of supplier development.

There are many different types of information that can be shared within a supply chain. In this study, Inventory knowledge and need information are emphasized. Partners like to share Inventory information more. Sharing this avoids stock loss and stock duplication. It also reduces the total amount of stock and stock costs allowing for more accurate forecasts and decisions to be made. Information on sharing orders can lead to a faster decision on supply chain blockchain, improving the quality of customer service (Zahra Lotfi ea al., 2013)

2.10. Supply Chain Performance and Supplier Development

SD plays an important role in improving supply chain performance which contributes to the overall efficiency of the organization, therefore, there is a growing interest in SD, driven

primarily by consumer desires to improve supplier performance that may reduce asset costs and development. to deliver greater efficiency throughout the supply chain (Li et al., 2012)

Handfield, (2002) states that there are gaps in supply chain performance between what they currently acquire and what they can do to control costs and quality, as well as their response to changing customer needs. SD can be started to close this operational gap to meet the needs of the purchasing firm both current and future. Njeru, (2013) in his study of Kenya Power sought to investigate the factors affecting SD in civil society organizations in Kenya. The study concluded that Kenya Power saw SD as a way to improve its efficiency.

Another study by Waraporn et al., (2012) on the impact of SD on supplier performance has investigated the role of consumer and supplier commitment to improving provider performance. The study recommended that managers should focus more on developing specific relationships with providers.

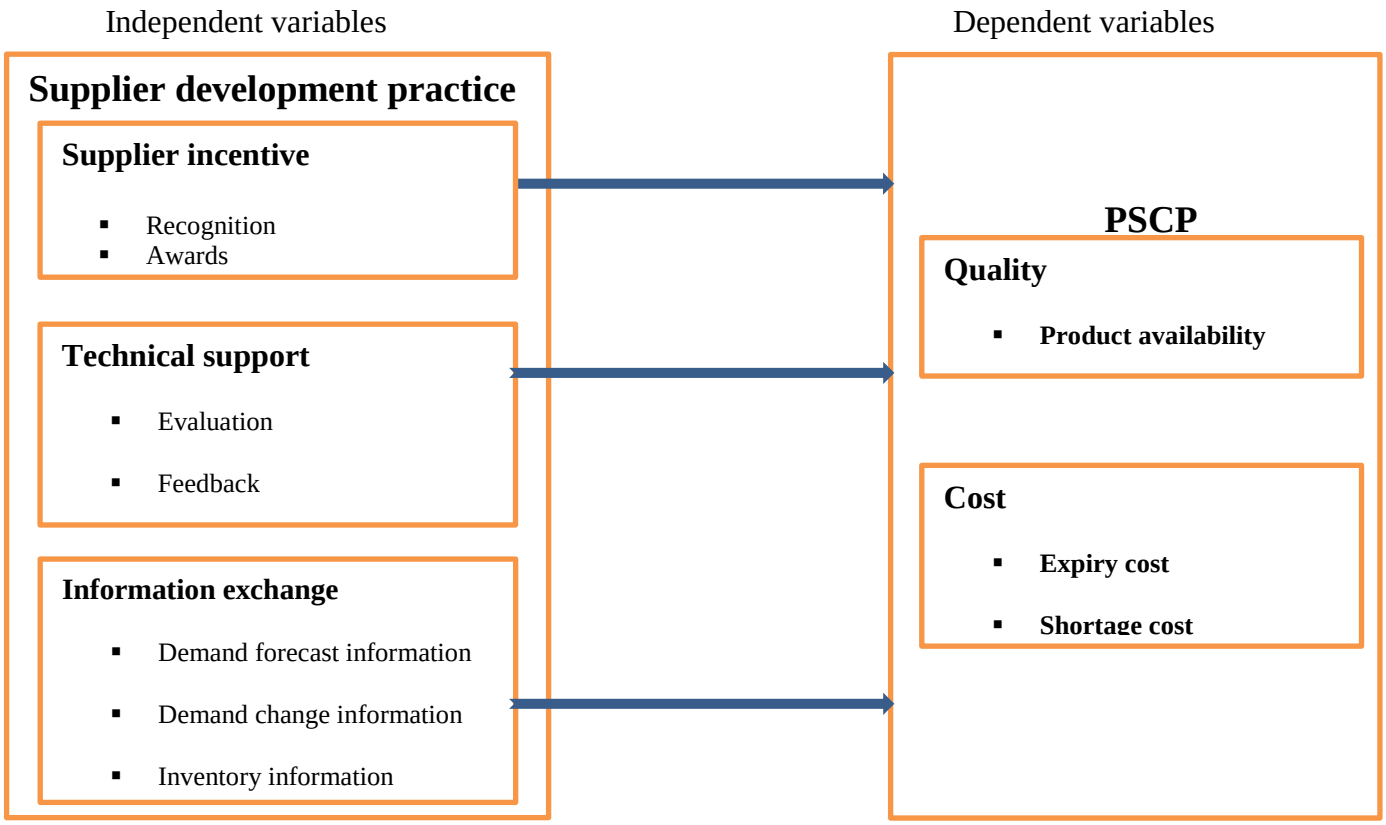
Thuita et al., (2018) evaluated the effects of technical support on suppliers on the effectiveness of the dairy supply chain in the Nyandarua County. The results of the study show that the technical support for the providers was positive and statistical

2.11. Conceptual Framework

Conceptual framework is a concise description of the phenomenon under study accompanied by graphical or visual depiction of major variables under study (Mugenda, 2008). According to Kothari (2011) conceptual frame work is a diagrammatical representation that shows the relationship between dependent variable of pharmaceutical supply chain performance and independent variables of supplier development practices. The supplier

development practices under consideration are: supplier incentives, technical support, and information exchange.

Conceptual frameworks, according to educational researcher Smyth (2004), are structured from a set of broad ideas and theories that help a researcher to properly identify the problem they are looking at, frame their questions and find suitable literature. Hence the conceptual framework of this study was designed after investigating empirical and theoretical reviews.



Source: Author, 2021

2.12. Research Hypothesis

H1.1. Supplier incentive has statistically significant effect on the performance of pharmaceuticals supply chain

H1.2. Technical support has statistically significant effect on the performance of pharmaceuticals supply chain

H1.3. Information exchange has statistically significant effect on the performance of pharmaceuticals supply chain

Chapter Three: Methodology

3.1. Introduction

This chapter covers the methods used to capture the data for the research. It includes detailed description of the proposed research design, population of interest, sample and sampling techniques, research instruments , data collection procedure, data analysis and presentation. This research methodology presents the overall framework on how to achieve research findings through data collection and analysis and presentation

3.2. Description of the study area

This study will be carried on government hospitals found in Addis Ababa, Ethiopia. List of hospitals to be included in this study are Black Lion specialized hospital, Amanual mental specialized hospital, Zewditu memorial general hospitals, Tikunesh-Beijing general hospitals, St. Peter specialized hospital, Gandhi memorial specialized hospital, Yekatit 12 general hospital, Alert general hospital, Menelik II comprehensive referral hospital, St. paulos specialized hospital, Ras Desta general hospital, Eka kotebe general hospital.

3.3. Research approach

Based on the types of data this study will be used quantitative approaches. Quantitative data based on structured questionnaires will be collected to describe the characteristics/effect/ of supplier development practices on the performance of pharmaceuticals supply chain

3.4. Research design

The research design can be exploratory, descriptive, experimental or imaginative. The nature of research - whether it explores, explains, depends on the category information about the topic of the research it has developed (Sankaran, 2000). The design is used to plan the study, to show how all the major parts of the study work together to try to answer key research questions. The design of a study is the arrangement of data collection and analysis conditions in a way that aims to integrate compliance with the research objective and economic process. Design is a conceptual framework in which research is conducted and creates a plan for data collection, measurement and analysis (Caldwell, 2014). According to Kothari et al. (2017) decisions about where, where, when, how much, what methods related to research or research form a research design.

This study follows a descriptive survey research design. According to Williams (2016) descriptive survey research design is used to obtain information concerning the status of the phenomena to describe "what exists" with respect to variables or conditions in a situation. Therefore descriptive survey research design will be used to assess the role of dependent variables such as supplier incentives, technical support and information exchange on the performance of pharmaceuticals supply chain. Respondents who are going to respond to the structured questionnaires are selected based on non-probabilistic purposive sampling.

3.5. Target population

The target population refers to the total number of studies or the total area of interest to the researcher (Caldwell, 2014). Kothari et al., (2017) defined the target population as all real or imagined members, people, events or topics the researcher wishes to summarize his or her

findings. The target population is defined as the total number of respondents that meet the set of conditions (Saunders, et al., 2015).

The target population included all government hospitals in Addis Ababa, Ethiopia. The researcher therefore focused on all the 12 government hospitals as a census study because the study population was small.

3.6. Sample frame

Lavrakas (2008) defines a sample framework as a target list of people from whom a sample is selected. In descriptive survey designs the sample framework usually contains a limited population. Mugenda and Mugenda (2003) and Kothari (2004) define the term sample framework as a list containing the names of elements in the universe to be studied.

Therefore, the sampling frame for this study consisted of government hospitals of Addis Ababa, which comprise of three specialized hospitals, two medical college, one comprehensive referral hospital, and six general hospital.

3.7. Sample size determination

Williams (2016) noted that sampling is not necessary if the population is small. Instead, the entire population should be used when time and resources allow as this increases reliability. Managerial level pharmacists were taken from each hospital. There are seven managerial level pharmacists in each government hospitals. Therefore, the study used a total of 84 respondents from the 12 government hospitals of Addis Ababa Ethiopia as shown in table 3.1.

Table 3.1: sample size determination

Category	Respondents	Percentage	Sample size
Pharmacy directorate	12	14.3	12
Drug supply management coordinator	12	14.3	12
Pharmaceuticals purchaser	12	14.3	12
Drug store manager	12	14.3	12
Outpatient pharmacy head	12	14.3	12
Inpatient pharmacy head	12	14.3	12
Emergency pharmacy head	12	14.3	12
Total population	84	100	84

Source: Researcher (2022)

3.8. Sampling technique

The purposive sampling technique was used to sample the respondents of the study. The advantage of the purposive sampling according to Bailey (2014) is that, it enables researchers to use their skills and prior knowledge of the subject to select respondents. In this study, respondents were chosen on the basis of their knowledge and experience about the topic under investigation. Therefore, each hospital's pharmacy directorate, drug supply chain management coordinator, pharmaceutical purchaser, out-patient pharmacy head, in-patient pharmacy head, drug store manager, emergency pharmacy head were selected purposely by believing that they have better information to fill the structured questionnaires that were designed and also they can easily understand the concepts under study.

3.9. Sources of data

The data for the study is obtained from primary sources. Primary data is collected from respondents which are chosen through purposive sampling technique. The instruments engaged in order to collect primary data is structured questionnaires.

3.10. Data collection instrument and method

The data collection instrument that is used is an open ended Questionnaire which was designed using the variables identified as important for meeting study objectives. The questionnaire is used since it is easy to administer and the data obtained is easy to analyze (Mugenda and Mugenda (2003).

Using a likert scale of 5 points, the researcher opts to use "strongly disagree" as one (1) point while "strongly agree" as five (5) point scale in studying the sample responses. The respondents will be asked to select the most appropriate number (Likert scale; 1 - 5) that suit the level of agreement against the statement provided. The drop and pick later method will be used in the administration of the questionnaires**.**

3.11. Data reliability and Validity

3.11.1. Data validity

Validity explains how well the collected data covers the actual area of study (Ghauri and Gronhaug, 2005). Validity basically means "measure what is intended to be measured" (Field, 2005).

The three major types of validity tests include content, construct and criterion. Golafshani (2003) define content validity as the exhaustiveness of the items in the instrument such that they can measure the traits or property of the variable that needs measure. On the other hand, criterion validity is the extent to which an instrument and measurements being applied resemble those that have been used in other studies. Finally, construct validity is the extent to which the instruments and tools including the representative constructs correctly and accurately measures the variable it ought to measure (Cooper et al., 2006). This study will be focused on the analysis of the construct validity. In order to establish construct validity, researchers have to validate both convergence and discrimination (Henseler et al, 2014). Convergent validity measures the extent that the items proposed for a construct are actually correlated. Discriminant validity, by contrast, measures the degree that variables that should not describe a construct actually do not correlate with the construct.

In this study, the researcher is going to design new questionnaires. When measuring a new tests Campbell and Fiske (1959) have assured the significance of using both convergent and divergent validation methods when measuring new tests.

Cheung et al., (2017) recommend the effective way of evaluating convergent and divergent validity. According to them, to ascertain convergent validity the average variance extracted (AVE) should not significantly smaller than 0.5 and standardized factor loading of all items should not significantly less than 0.5 and the correlation between constructs should not significantly larger than 0.7 to ascertain divergent validity.

3.11.2. Data reliability

Reliability is an extent to which a questionnaire, test, observation or any measurement procedure produces the same results on repeated trials. In short, it is the stability or consistency of scores over time or across raters (Miller, 2015). According to Kothari (2004), reliability can be categorized into three forms; test-retest reliability, Alternate-form reliability and internal consistency reliability. The researcher will make use of internal consistency. Internal consistency of the instrument will be computed by Cronbach‟s alpha reliability coefficients. Cronbach's alpha determines whether the same measurement values can be obtained when measurements are repeated for the same concept. Bryman (2012) recommended that reliability test which produces Cronbach alpha (α) values of greater than 0.70 is sufficient in making the questionnaires reliable. According to George and Mallery (2008), a Cronbach alpha coefficient greater or equal to 0.7 is acceptable.

3.12. Data analysis

According to Kothari et al. (2017), there are three objectives in data analysis: getting a feel for the data, testing the goodness or fitness of the data and testing hypothesis developed for the research. A feel for the data gives the researcher a good idea of how well the respondent have reacted to the items in the questionnaire and how good the items and measures are outlined. This includes descriptive statistics such as the response rate, mean and standard deviations of the observed variables (Lerman, 2016). Establishing the goodness or fitness of the data lends credibility to all subsequent analysis and findings because it measures the reliability and validity of the measures used in the study. Once the data is ready for analysis, the hypothesis is tested.

In this study the data and information obtained through the questionnaires will be first checked for completeness. Quantitative data gathered from correctly filled questionnaires will be coded, tabulated and analyzed using SPSS version 23 by both descriptive statistics and inferential statistics. The descriptive statistics which include frequency, percentage, mean and standard deviation will be used to capture the characteristics of the variables under study. The inferential statistics analyzed by conducting Pearson Product Moment Correlation. Pearson's correlations to examine the relationship among the study variables and a simple linear regression method was used to analyze what effect has each independent variable on the dependent variable.

3.13. Ethical consideration

Before commencing data collection, ethical approval will be requested from the Ethics Review Committee of the School of commerce, Addis Ababa University. Then, after ethical approval is obtained, the selected hospitals will be communicated with formal letters from the School of commerce, Addis Ababa University. The study will be conducted in the selected hospitals after permission from recognized body is obtained. Participants of the study will be asked for consent before participating in the study. During the consent process, the information regarding the purpose of the study will be provided, why and how they are selected to be involved in the study, and what is expected from them are explained, and also they are informed that they can withdraw from the study at any time. Participants will also be assured about confidentiality of the information obtained in the course of the study by not using personal identifiers and analyzing the data in aggregates. The name for whom a questionnaire is administered and the public facility in which they work will not appear in data analysis.

Chapter four: Data analysis, finding and discussion

4.1. Introduction

This study was carried out to establish the role of supplier development on pharmaceutical supply chain performance on the government hospitals of Addis Ababa, Ethiopia. Data was collected from pharmacists who have a managerial level responsibility. The questionnaire was filled by Pharmacy directorate, drug supply chain management coordinator, pharmaceuticals purchaser, drug store manager, outpatient pharmacy head, inpatient pharmacy head, and emergency pharmacy head of each hospitals.

4.2. Response rate

A total of 84 questionnaires were distributed to the twelve hospitals that are found in Addis Ababa, Ethiopia. Out of the 84 questionnaires, 69 were filled-up and returned to the researcher. This gave a response rate of 82%. This response rate was favorable according to Mugenda and Mugenda (2008) in which they assert that a 50% response rate is adequate, 60% good and above 70% rated very well. Thus a response rate of 82%, obtained in this study is much enough. The 18% who never returned the questionnaires cited busy schedules as the main reason for lacking time to fill them.

4.3. Instrument validity and reliability analysis

4.3.1. Instrument validity analysis

When designing a new questionnaire, Campbell and Fiske (1959) have assured the significance of using both convergent and divergent validation methods.

4.3.1.1. Convergent validity

To effectively evaluate convergent validity of a new instrument, factor loading should be greater than 0.5 Fraering and Minor (2006).

The suitability of the data for factor analysis should be analyzed based on KMO and Bartlett's test. After removing poor loading factor having items and items located at different component part the result for KMO and Bartlett's Test was computed and resulted in a 0.783 value which was acceptable value as shown in Table 4.1 below. Therefore factor analysis is appropriate since Significance value (Sig. value "p = .000).

Table 4.1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.783
Bartlett's Test of Sphericity	Approx. Chi-Square	2016.007
	Df	276
	Sig.	.000

Source: researcher's survey

During dimension reduction the researcher used a principal component analysis (PCA) and a varimax as rotation method with a loading cutoff point of +0.50. Items loaded above 0.5 have been indicated in table 4.2 in which their convergent validity was accepted.

Items that were poorly loaded, cross-load on factors with which they are not supposed to be related have been deleted (Hair et al. 2005). Therefore from supplier incentives variable item SI1, SI2, SI3, SI5, SI6, AND SI10 was omitted. From technical support variable item TS1, TS3, TS4 AND TS8 was omitted. From information exchange variable item IE1 AND IE3 was omitted

The rest items was load above 0.50 has been indicated in table 4.2

Table 4.2 Rotated Component Matrix

	Component			
	1	2	3	4
SI4		.742		
SI7		.944		
SI8		.916		
SI9		.883		
SI11		.653		
SI12		.855		
TS2			.948	
TS5			.676	
TS6			.752	
TS7			.836	
TS9			.819	
TS10			.851	
IE2	.942			
IE4	.809			
IE5	.822			
IE6	.735			
IE7	.849			
IE8	.741			
IE9	.861			
PSCP1				.750
PSCP2				.945
PSCP3				.875
PSCP4				.842
PSCP5				.853

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

4.3.1.2. Divergent validity

According to Cheung et al., (2017), a correlation between constructs should not significantly greater than 0.7 in order for an item to be supported by divergent validity. As table 4.3 indicates the correlation between constructs are below 0.7 so that divergent validity were established.

Table 4.3 Correlation between constructs

		PSCP	IE	TS	SI
PSCP	Pearson Correlation	1	.440**	.378**	.338**
	Sig. (2-tailed)		.000	.001	.004
	N	69	69	69	69
IE	Pearson Correlation	.440**	1	.431**	.346**
	Sig. (2-tailed)	.000		.000	.004
	N	69	69	69	69
TS	Pearson Correlation	.378**	.431**	1	.352**
	Sig. (2-tailed)	.001	.000		.003
	N	69	69	69	69
SI	Pearson Correlation	.338**	.346**	.352**	1
	Sig. (2-tailed)	.004	.004	.003	
	N	69	69	69	69

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

4.3.2. Instrument reliability analysis

A questionnaire with a high reliability would receive similar answers if it is done again or by other researchers (Cooper & Schindler, 2014). The reliability of the questionnaires was determined through the Cronbach alpha method. Cronbach alpha which provided a good measure of reliability because holding other factors constant the more similar the test content and conditions of administration are, the greater the internal consistency and reliability. Bryman (2012) recommended that reliability test which produces Cronbach alpha (α) values of greater than 0.70 is sufficient in making the questionnaires reliable. The Cranach's Alpha Test was conducted on all the independent and dependent variables which gave a threshold which was greater than 0.7 as indicated in table 4.4. According to George and Mallery (2008), a Cronbach alpha coefficient greater or equal to 0.7 is acceptable.

Table 4.4 Reliability test

Study variables	Items loaded greater than 0.5	Number of test items	Cronbach's Alpha
Supplier incentive	SI4 SI7 SI8 SI9 SI11 SI12	6	0.787
Technical support	TS2 TS5 TS6 TS7 TS9 TS10	6	0.777
Information exchange	IE2 IE4 IE5 IE6 IE7 IE8 IE9	7	0.769
Pharmaceuticals supply chain performance	PSCP1 PSCP2 PSCP3 PSCP4 PSCP5	6	0.782

Source: researcher's survey

4.4. General information

The purpose of assessing respondents' age, sex, is that, to determine whether the researcher considered heterogeneity of sample units. On the other hand assessing the work experience and education level of the respondents" is that, when the respondents are more experienced and educated they have better opportunity to understand the case and give better response than else.

4.4.1. Respondents gender

Gender frequency analysis as presented in table 4.5 showed that majority of the respondents were male which constituted 69.6 % while the females constituted 30.4%. From a total of 69 respondents 48 were male and 21 were female. There was a big difference between male and female respondents; this implies that managerial level of females was very much lesser than male.

Table 4.5 Respondents' gender

		Frequency	Percent	Valid Percent
Valid	Male	48	68.6	69.6
	Female	21	30.0	30.4
	Total	69	98.6	100.0

Source: researcher's survey

4.4.2. Education qualification

The study shows the education level composition of the respondent. Table 4.6 represents the result. The finding in table below shows that most of the respondents have Bachelor degrees with a contribution of 46 out of 69 respondents equivalents to 66.7%, followed by Masters with the contribution of 31.9.% (22) and Diploma level has contributed 1.4% (1). This indicate that the desired and acceptable education level to serve in government hospitals is bachelor degree as most of the respondents have proved.

Table 4.6 Respondents' education level

	Education level	Frequency	Percent	Valid Percent
Valid	Masters	22	31.4	31.9
	Degree	46	65.7	66.7
	Diploma	1	1.4	1.4
	Total	69	98.6	100.0

Source: researcher's survey

4.4.3. Work experience

As it has been indicated in table 4.7, the researcher divided the work experience of the respondents in to four category starting from below 3 years to above 9 years based on their license level. The result shows that most of the respondents have working experience of 6– 9 years with a contribution of 31 out of 69 equivalent to 47.3%, followed by above 9 years with a contribution of 21 (30.4%). Respondents with experience of 3 – 6 years have contribution of 12 (17.4%) while the least of respondents with experience below 3 years were 5 (7.2%) out of 65 respondents. This implies that most of the managerial level occupied with pharmacists whose working experience of 6-9 years.

Table 4.7: Respondents by work experience

	Work experience	Frequency	Percent	Valid Percent
Valid	below 3 years	5	7.0	7.2
	3-6 years	12	16.9	17.4
	6-9 years	31	43.7	44.9
	above 9 years	21	29.6	30.4
	Total	69	97.2	100.0
	System	2	2.8	
Total		71	100.0	

Source: researcher's survey

4.4.4. Percentage of respondents by work position

Pharmacists assigned as Pharmacy directorate, DCM coordinator, Pharmaceuticals Purchaser, Drug store manager, Outpatient pharmacy head, Inpatient pharmacy head, and Emergency pharmacy head were selected by the researcher to respond to the questionnaire and the percentage of respondents filled the questionnaire properly were indicated Table 2.4 below.

As depicted in table 4.8 below, out of the twelve pharmacy directorates expected to respond a questionnaire all of them were responding it. As of pharmacy directorates all expected drug supply chain (DCM) coordinators and pharmaceutical purchasers' respondents were responding the questionnaire well. Next to pharmacy directorates, DCM coordinators and pharmaceutical purchasers' large number of out- patient pharmacy heads were responding which constituted a 91.6%. The rest drug store managers, in-patient pharmacy heads and emergency pharmacy heads were responding 66.6%, 75% and 41.6% respectively.

Table 4.8 Respondents' by work position

Working position	Expected respondents	Participated respondent	Valid Percent
Pharmacy directorate	12	12	100
DCM coordinator	12	12	100
Pharmaceuticals Purchaser	12	12	100
Drug store manager	12	8	66.6
Outpatient pharmacy head	12	11	91.6
Inpatient pharmacy head	12	9	75
Emergency pharmacy head	12	5	41.6

Source: researcher's survey

4.4.5. Percentage of response from where hospitals purchase pharmaceuticals

The researcher wanted to know from where hospitals purchased pharmaceuticals and respondents response were indicated in table 2.9 below:

Table 4.9 showed that all respondents agreed that their hospital purchase pharmaceuticals from both government supplier (EPSA) and private pharmaceutical suppliers.

Table 4.9: Respondents' response from where their hospital purchase pharmaceuticals

Purchased from	Expected number of respondents	Replied respondents	Valid percent
Government supplier (EPSA) only	69	0	0
From private pharmaceuticals suppliers only	69	0	0
From both government and private pharmaceuticals suppliers	69	69	100

Source: researcher's survey

4.4.6. Respondents' response about the amount of pharmaceuticals purchased from private suppliers

All respondents replied that the amount of pharmaceuticals purchased from private pharmaceutical suppliers is lesser than government supplier. This showed that though hospitals purchased pharmaceuticals from both private and government suppliers as indicated in table 4.10, however they purchase lesser amount of pharmaceuticals from private suppliers.

Table 4.10 Respondents' response about the amount of pharmaceuticals purchased from private suppliers

Pharmaceuticals purchased from private suppliers is	Expected number of respondents	Replied respondents	Valid percent
Very much higher than government supplier	69	0	0
Higher than government supplier	69	0	0
Moderately higher than government supplier	69	0	0
Lesser than government supplier	69	69	100
Very much lesser than government supplier	69	0	0

Source: researcher's survey

4.5. Descriptive statistics

Descriptive findings were used to establish the percentage, mean and standard deviation of the responses on the various variables of the study on a Likert scale of 1-5. The standard deviation was also presented to indicate the magnitude of variations in the responses for all the variables in the study. The study weighed the rating on a scale of 1-5 with 1= strongly disagree (SD), 2=disagree (D), 3=Not sure (NS), 4=agree (A) and 5=strongly agree (SA) and presented the mean response per statement for all the study variables.

According to Oxford and Burry-stock, (1995) the overall mean value range between 1.0 and 2.4 was scored as it is poor, over all mean value range between 2.5 and 3.4 was scored as it is medium and over all mean value range between 3.5 and 5 was scored as it is high.

4.5.1. Supplier development dimensions

The study sought to establish the extent of supplier development dimensions among government hospital Addis Ababa, Ethiopia. According to the result presented in table 4.11 below, 37.7 % of the respondents were neutral on the concept of supplier development, 26.1% of the respondents respond that they were strongly agree as they had SD concept. 18.8% agreed that they had SD concept. SD concept understanding was agreed by 18.8% of the respondents. There were no strongly disagreed respondents about the understanding of SD concept. The overall mean value (3.53) of the statement represented that majority of the respondents agreed as having concepts about supplier development though the response was scattered from the mean at higher level as indicated in standard deviation value of 1.07. The overall mean value of respondents' concept about supplier development was 3.53 which indicated that respondents' had higher concept about SD.

Hospital pharmacists' opinion about the necessity of SD in the pharmaceuticals supply chain management was neutral by 39.1%, strongly agreed by 26.4% and agreed by 20.3%. 15.9% of the respondents disagreed on the necessity of SD in the SCM. However, no respondent strongly disagreed about the necessity of SD in the SCM. The overall mean value (3.54) of the statement represented that majority of the respondents agreed the necessity of SD in the PSCM though respondents' response about the statement was highly varied as indicated from the standard deviation value (1.04).

The third statement concerning the supplier development dimension was whether the private pharmaceutical suppliers (PPSs) supplying progress were incentivized by government hospitals or not. The respondents response whether their hospital incentivize the supplying progress of

PPSs were strongly disagreed by 36.2% and disagreed by 34.8% respondents. Neither disagreed nor agreed the statement was 27.5%. Only 1.4% of the respondents were agreed as their hospitals incentivize PPSs supplying progress. No one was strongly agreed the statement. the overall mean value of whether government hospitals incentivize highly performed PPSs or not was 1.94 which indicated that the level of government hospital' providing incentives in the form of award and recognition for best performed PPSs was poor.

Government hospitals evaluate PPSs delivery performance and provide evaluation feedback in order to support PPSs technically was disagreed by 42.0% and the statement was strongly disagreed by 34.8%. 23.2% of the respondents were neither disagreed nor agreed upon the statement that hospitals evaluate PPSs delivery performance and provide evaluation feedback in order to support PPSs technically. There was no strongly agreed and agreed respondents on the statement that your private pharmaceutical suppliers' delivery performance will be evaluated and the result will be communicated in order to support them technically. The overall mean value (1.89) showed that the extent of government hospitals evaluation and feedback providing about the evaluation result was poor.

55.1% of the respondents were strongly disagreed as there were an information exchange between their hospitals and PPSs. 33.3% of the respondents also disagreed the statement.

Table 4.11: Supplier development dimensions data

Statement	SD	DA	NE	AD	SA	Mean	Std. Deviation
I do understand the supplier development concept	0%	17.4%	37.7%	18.8%	26.1%	3.53	1.07
In my opinion, supplier development is necessary in pharmaceuticals supply chain management	0%	15.9%	39.1%	20.3%	24.6%	3.54	1.04
Your hospital incentivize private pharmaceutical suppliers progress in the form of awards and recognition	36.2	34.8	27.5	1.4	0	1.94	0.76
Your private pharmaceutical suppliers' delivery performance will be evaluated and the result will be communicated in order to support them technically	34.8	42.0	23.2	0	0	1.89	0.76
There is information exchange between your hospital and private pharmaceutical suppliers	55.1	33.3	8.7	2.1	0	1.59	0.77
Average mean value						2.5	0.45

Source: researcher's survey

4.6 Diagnostic test

The study sought to determine the role of supplier development on the improvement of pharmaceuticals supply chain performance in government hospitals of Addis Ababa, Ethiopia. Therefore, the data was tested for adherence to the assumptions of regression analysis; linearity, multicollinearity, autocorrelation, normality and homoscedasticity (Thode, 2002).

4.6.1. Normality test

The normality test refers to statistical tests on a data to determine whether a data set is well modeled by a normal distribution (Berk, 2003). Normally distributed data yields better regression

results because any random variable in a data set is normally distributed. The normality test used is the Kolmogorov-Smirnov (KS) and Shapiro Wilk (SW). The alternative hypothesis for KS and SW test is that the data sets follow a normal curve. The hypothesis is tested at 5% level of significant. If the p-value for KS and SW statistic is more than 0.05, alternative hypothesis is rejected. The results have shown in table 4.12 below. According to the KS and SW test in table 4.12 below, the significant values for all the variables were more than 0.05. Therefore, alternative hypothesis was rejected. It was concluded that the data was not normally distributed. Therefore, the data was not normally distributed.

Table 4.12 Normality test

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Pscp	.186	69	.000	.920	69	.000
Ie	.207	69	.000	.831	69	.000
Ts	.199	69	.000	.862	69	.000
Si	.138	69	.002	.940	69	.002

a. Lilliefors Significance Correction

4.6.2. Homoscedasticity test

Homoscedasticity is the test of whether the data set has equal variances (deviations) throughout from the first data point to the last. That is called homogeneity of variance. Data with equal/homogeneous variances is said to be homoscedastic while those with varying deviations is said to be heteroscedastic (Brewer, 2002). Homoscedastic data sets yields more accurate regression result.

The test for homogeneity of variance was tested using Levine statistic. The alternative hypothesis is that the data has homogeneous variances and the hypothesis was tested at 5% level of

significance. For Levine test, if the significant value of the Levine statistics less than 0.05, we fail to reject the alternative hypothesis. According to the results in table 4.13 belowe, the significant value for all the study variables are more than 0.05. Therefore, we reject the alternative hypothesis that the data sets have equal variances and conclude that the data sets are heterogeneous.

Table 4.13 Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Ie	.988	9	54	.461
Ts	1.458	9	54	.187
Si	1.660	9	54	.122
Pscp	.714	9	54	.694

4.6.3. Multicollinearity Test

The test for multicollinearity evaluates whether the predictor variables do have some association. The collinearity statistics that were used include the Tolerance Statistic and Variance Inflation Factor (VIF). The rule of thumb for this test is that Tolerance Statistic considerably larger than 1 indicates possibility of multicollinearity between the predictor variables, and if any of the variable‟s VIF is larger than 1, multicollinearity is definitely present. The results shown in table 4.14 indicate that the tolerance statistics for all of the predictor variables was less than 1. Also, the VIFs are all way below than 10. The alternative hypothesis for this test was that the data was linearly related. Therefore, according to the study results, we reject the alternative hypothesis and conclude that the predictor variables have no linear relationship (Corder & Foreman, 2014). That is a positive thing because highly correlated predictors tend to inflate the causation as determined by R and R-Squared leading to erroneous conclusions.

Table 4.14 Multicollinearity Statistics

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Ie	.771	1.296
	Ts	.768	1.302
	Si	.830	1.205

4.6.4. Autocorrelation Test

Although autocorrelation is a typical problem with longitudinal data and less common problem in cross-sectional data, it is one of the important tests when conducting studies involving regression analysis. For this study, Durbin Watson (DW) test for autocorrelation was used. According to the study results in table 4.18, the obtained Durbin Watson statistic is 1.276. DW test ranges between 0 and 4. Both extremes suggest presence of autocorrelation. A DW statistic equal to 2.0 indicates no presence of autocorrelation. For the current study, the statistic is 1.276 indicating a possibility of 1st order autocorrelation, although this is not definite as the statistic is still far away from 0.00 (Simel et al., 1991). Therefore, fail to reject the alternative hypothesis that the data has serial correlation

Table 4.15 Durbin Watson Test for Autocorrelation

Model	Durbin-Watson
1	1.276

Dependent Variable: pscp

4.6.5. Linearity Test

Test of linearity is confirmed through regression analysis by assessing the coefficient determination and coefficient of correlation or through scatter plots. Table 4.16 shows the

linearity tests using both the correlation coefficient statistics and coefficient of determination (R-Square)

As shown in table 4.19 below, the linearity test statistic R which is 0.510 is positive and the R-Square which tests the strength of relationship is 0.260, signifying a moderately weak relationship. According to the model results, supplier incentive, technical support and information exchange collectively explains 26 percent of variations in changes in performance of government hospitals' pharmaceuticals supply chain performance meaning other factors not included in the model are responsible for 64 percent of the variations.

Table 4.16 Model Summary Statistics and Coefficients to test linearity

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.510[a]	.260	.226	4.85755

4.7. Inferential statistics

4.7.1. Correlation Analysis

Pearson Bivariate correlation coefficient was used to compute the correlation between the dependent variable (Pharmaceuticals supply chain performance) and the independent variables (supplier incentive, technical support, and information exchange). As stated by Sekaran (2015), this relationship is assumed to be linear and the correlation coefficient ranges from -1.0 (perfect negative correlation) to +1.0 (perfect positive relationship).

Since the study is about the role of supplier development on pharmaceuticals supply chain performance, the interpretation section in this part of analysis focuses on the correlation between pharmaceuticals supply chain performances with all the other study variables such as supplier incentive, technical support and information exchange.

4.7.1.1. Supplier Incentive and Pharmaceuticals Supply Chain Performance

The correlation result indicated in table 4.17 below showed that supplier incentive has statistically significant positive association with pharmaceuticals supply chain performance at significant level of less than 0.005. The association was moderatly weak as the correlation coefficient (r) was 0.338. Therefore, supplier incentive and pharmaceutical supply chain performance has weak positive correlation at a significant level of 0.004. This indicates that a change in supplier incentive leads to a significant change in pharmaceuticals supply chain performance. Hence incentivizing private pharmaceutical suppliers improve government hospitals' pharmaceutical supply chain performance.

Table 4.17 Pearson Correlation Matrix of supplier incentive and pharmaceuticals supply chain performance

		PSCP	SI
PSCP	Pearson Correlation	1	.338**
	Sig. (2-tailed)		.004
	N	69	69
SI	Pearson Correlation	.338**	1
	Sig. (2-tailed)	.004	
	N	69	69

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

4.7.1.2. Technical support and Pharmaceuticals Supply Chain Performance

As shown in table 4.18, though there was a moderately weak positive correlation between technical support and pharmaceuticals supply chain performance with correlation coefficient of 0.378 however the correlation was statistically significant (p=0.01). This indicates that a change in supplier technical support leads to a significant change in pharmaceuticals supply chain performance. Therefore government hospitals would improve their pharmaceuticals supply chin performance by supporting private pharmaceutical suppliers technically.

Table 4.18 Pearson Correlation Matrix of technical support and pharmaceuticals supply chain performance

		PSCP	TS
PSCP	Pearson Correlation	1	.378**
	Sig. (2-tailed)		.001
	N	69	69
TS	Pearson Correlation	.378**	1
	Sig. (2-tailed)	.001	
	N	69	69

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

4.7.1.3. Information exchange and Pharmaceuticals Supply Chain Performance

The study result depicted in table 4.19 that there was moderate correlation between information exchange and PSCP since the Pearson Correlation Coefficient (r=0.440). The correlation between information exchange and PSCP was statistically significant at P value=0.000. Therefore information exchange with private pharmaceuticals supplier leads to a significant change in pharmaceuticals supply chain performance. Therefore when government hospitals ensured information exchange with their private pharmaceutical suppliers, they could improve their PSCP.

Table 4.19 Pearson Correlation Matrix of information exchange and pharmaceuticals supply chain performance

		PSCP	IE
PSCP	Pearson Correlation	1	.440**
	Sig. (2-tailed)		.000
	N	69	69
IE	Pearson Correlation	.440**	1
	Sig. (2-tailed)	.000	
	N	69	69

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

4.7.2. Regression analysis

After Factor analysis technique, the researcher adopted a simple linear regression analysis to test the relationship among each independent variable with the dependent variable of the study. Since the study was sought to determine the role of supplier development on the improvement of pharmaceuticals supply chain performance in government hospitals of Addis Ababa, Ethiopia; therefore, the data was tested for adherence to the assumptions of regression analysis; linearity, multicollinearity, autocorrelation, normality and homoscedasticity (Thode, 2002).

In light of the results of the diagnostic tests for adherence to assumptions of regression, the data had to be transformed into natural logarithm before regression analysis as some assumptions such as normality, homogeneity of variance and autocorrelation were violated (Corder & Foreman, 2014). Therefore all the regression analysis used the data in its natural logarithm form. Transformed data was used because it did not meet all the requirements (assumptions) for regression analysis as shown by the diagnostic test results.

4.7.2.1. Effect of supplier incentive on PSCP

Using simple linear regression analysis; the model summary describes the overall contribution of the predictors (supplier incentive) to the dependent variable (Performance of Pharmaceuticals Supply Chain) as shown in Table 4.20 below. The result shows that the value of R2 is 9%; this implies that supplier incentive is direct linked with performance of Pharmaceutical Supply Chain.

The model summary results indicated in table 4.20 below showed that the relationship between the predictors and dependent variables, depicted by the regression coefficient (R) value is .300 (30%). This means that there is a weak relationship between the two variables. Also, as indicated by the table, the variations in dependent variable as a result of the predicting variable, as indicated by R-Square value, are .090 (9%). This implies that only 9% variations in PSCP are explained by supplier incentive with the remaining 91% being accounted for by other factors not included in the model. This value is significant because the significance level is =.012 which is less than the 0.05. This result implies that overall; regression model is statistically significant, valid and fit. This suggests implicitly that the independent variable (supplier incentive) has significant positive relationship with the independent variable (PSCP).

The coefficients regression of table 4.20 below shows that supplier incentive has .300 coefficient value with Sig. value of .012. The implication of this is that increase in supplier incentive by one percent, holding other variables constant, will lead to increase in PSCP) by 30%. This result is significant in view of the Sig. value .012. Based on the empirical result, there is a statistically significant effect of supplier incentive on PSCP of thus, the alternate hypothesis is accepted.

Table 4.20 regression result of supplier incentive and performance of pharmaceuticals supply chain

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.300[a]	.090	.076	.15464	.090	6.632	1	67	.012

a. Predictors: (Constant), lnsi

b. Dependent Variable: lnpscp

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.159	1	.159	6.632	.012[b]
	Residual	1.602	67	.024		
	Total	1.761	68			

a. Dependent Variable: lnpscp

b. Predictors: (Constant), lnsi

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.979	.228		13.085	.000
	Lnsi	.188	.073	.300	2.575	.012

4.7.2.2. Effect of technical support on PSCP

Using simple linear regression analysis; the model summary describes the overall contribution of the predictors (technical support) to the dependent variable (Performance of Pharmaceuticals Supply Chain) as shown in Table 4.21 below. The result shows that the value of R2 is 0.100 (10%); this implies that supplier incentive is direct linked with performance of Pharmaceutical Supply Chain.

The model summary results indicated in table 4.21 below showed that the relationship between the predictors and dependent variables, depicted by the regression coefficient (R) value is .316 (31.6%). This means that there is a moderately weak relationship between the two variables. Also, as indicated by the table, the variations in dependent variable as a result of the predicting variable, as indicated by R-Square value, are .100 (10%). This implies that only 10% variations in PSCP are explained by technical support with the remaining 90% being accounted for by other factors not included in the model. This value is significant because the significance level is =.008 which is less than the 0.05. This result implies that overall regression model is statistically significant, valid and fit. This suggests implicitly that the independent variable (technical support) has significant positive relationship with the independent variable (PSCP).

The coefficients regression of table 4.21 below showed that supplier technical support has .316 coefficient value with t-statistics value of 3.338 and Sig. value of .008. The implication of this is that increase in supplier technical support by one percent, holding other variables constant, will lead to increase in PSCP by 31.6%. This result is significant in view of the Sig. value (of .008). Based on the empirical result, there is a statistically significant effect of technical support on PSCP thus, the alternate hypothesis is accepted.

Table 4.21 regression result of technical support and performance of pharmaceuticals supply chain

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.316[a]	.100	.087	.15378	.100	7.457	1	67	.008

a. Predictors: (Constant), lnts

b. Dependent Variable: lnpscp

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.176	1	.176	7.457	.008[b]
	Residual	1.584	67	.024		
	Total	1.761	68			

a. Dependent Variable: lnpscp

b. Predictors: (Constant), lnts

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.529	.379		6.667	.000
	lnts	.275	.101	.316	2.731	.008

4.7.2.3. Effect of information exchange on PSCP

The model summary results indicated in table 4.22 below showed that the relationship between the predictors and dependent variables, depicted by the regression coefficient (R) value is .313(31.3%). This means that there is a moderately weak relationship between the two variables. Also, as indicated by the table, the variations in dependent variable as a result of the predicting variable, as indicated by R-Square value, are .98(98%). This implies that only 98% variations in PSCP are explained by information exchnge with the remaining 2% being accounted for by other factors not included in the model. This value is significant because the significance level is =.009 which is less than the 0.05. This result implies that overall regression model is statistically significant, valid and fit. This suggests implicitly that the independent variable (information exchange) has significant positive relationship with the independent variable (PSCP).

The coefficients regression of table 4.22 below showed that information exchange has .313 coefficient value with Sig. value of .009. The implication of this is that increase in information exchange by one percent, holding other variables constant, will lead to increase in PSCP by 31.3%. This result is significant in view of the Sig. value (of .009). Based on the empirical result, there is a statistically significant effect of information exchange on PSCP of thus, the alternate hypothesis is accepted

Table 4.22 regression result of information exchange and performance of pharmaceuticals supply chain

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.313[a]	.098	.085	.15395	.098	7.294	1	67	.009

a. Predictors: (Constant), lnie

b. Dependent Variable: lnpscp

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.173	1	.173	7.294	.009[b]
	Residual	1.588	67	.024		
	Total	1.761	68			

a. Dependent Variable: lnpscp

b. Predictors: (Constant), lnie

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.614	.352		7.422	.000
	Lnie	.240	.089	.313	2.701	.009

Chapter five: summary of findings, Conclusion and Recommendation

5.1 Summary of findings

The purpose of this study was to identify the role of supplier development on the improvement of pharmaceuticals supply chain performance in the government hospital of Addis Ababa, Ethiopia. The study was having four specific objectives: ascertaining whether supplier incentive likely to have a statistically positive relationship with performance of pharmaceuticals supply chain, determining whether technical support likely to have statistically positive relationship with performance of pharmaceuticals supply chain, evaluating whether information exchange likely to have statistically positive relationship with performance of pharmaceuticals supply chain and determining the extent of supplier development among government hospitals.

A study result showed that government hospitals purchase pharmaceuticals item from both government supplier (EPSA) and private pharmaceutical suppliers. However, the amount of pharmaceuticals purchased from private pharmaceutical supplier was at a lesser amount.

The descriptive analysis of supplier development dimension revealed that the concept of respondents about supplier development was at a higher level and majority of the respondents agreed the necessity of SD in the pharmaceuticals supply chain management (PSCM). Though pharmacists agreed the necessity of SD in the PSCM, but the extent of government hospitals to exercise supplier development practice with respect to supplier incentive, technical support and information exchange for the sake of pharmaceuticals supply chain performance improvement were very less.

The correlation analysis was done to test the association of dependent and independent variables. As the study result confirmed that supplier incentive has a moderately weak positive relationship with performance of pharmaceutical supply chain with r value of 0.338. Supplier technical support has a weak positive relationship with PSCP with r value of 0.378. The last independent variable of this research, information exchange has a moderate positive relationship with PSCP with r value of 0.440.

A simple linear regression model was done in order to a check the acceptance of the alternate hypothesis of this study. The study finding revealed that supplier incentive has a statistically significant effect on the improvement of PSCP with p value of 0.012. The second hypothesis of the study which was saying that supplier technical support has a statistical significant effect on the performance of PSC has been accepted for the reason that its alpha value (0.008) is below 0.05. The last alternate hypothesis of this study that was saying information exchange has a statistical significant effect on the performance of PSC has also been accepted since its p value (0.009) was below 0.05.

5.2. Conclusion

The study was aimed to analyze what role supplier development had on the improvement of pharmaceuticals supply chain performance in government hospitals of Addis Ababa, Ethiopia. The study established a moderately significant positive relationship between three elements of supplier development namely supplier incentive, technical support and information exchange and pharmaceuticals supply chain performance. The study also revealed that both supplier incetive, technical support and information exchange have a statistical significant effect on the performance of PSC. Therefore the study concludes that government hospitals' pharmaceuticals

supply chain performance in terms of pharmaceuticals availability could be improved if they exercise supplier development activities and implementation of these activities have a significant effect to improve pharmaceuticals availability.. In addition hospitals' expenditure due to emergency purchase and cost of pharmaceuticals expiration could be minimized by implementation of supplier development activities and implementation of these activities has a significant effect on the cost reduction. In conclusion though the relationship between supplier development and pharmaceuticals supply chain performance was moderately weak however supplier development has statistically significant role on the improvement of government hospitals' pharmaceutical supply chain performance.

5.3. Recommendation

Based on the research findings the following recommendation is forwarded.

Government hospitals would benefit from supplier development activities if they practice it. However as the respondents confirmed that the extent of practicing supplier development activities was low; therefore, to be benefited from supplier development activities government hospitals has been recommended to implement supplier development activities for the sake of pharmaceuticals availability improvement and cost reduction.

Even though both supplier incentive, technical support and information exchange has significantly positive relationship with performance of pharmaceuticals supply chain and statistically significant effect on the improvement of PSCP, government hospitals should give more emphasis on the implementation of information exchange with private pharmaceutical supplier for the reason that it results a great variation with performance of pharmaceuticals

supply chain since its R square was 98%. The other two, supplier incentive and technical support, has almost equal R square result, 9% and 10% respectively.

One of the factors that affect hospitals service quality was poor availability of pharmaceuticals. Hence decision makers should support government hospitals to implement supplier development program, especially information exchange, in order to improve their service quality.

5.4 Further research

This study was used a non-probability sampling method which was criticized by its problem on generalization. Therefore the researcher recommended that this study should be done again with probability sampling method in order to generalize the finding.

Except making to know hospitals' annual procurement plan to support suppliers technically, giving letter of recommendation to incentivize suppliers and sharing demand change information, the other proposed mechanisms to incentivize, technically support and to exchange information were poorly loaded and omitted from the study. Therefore the researcher recommends that by what mechanisms private pharmaceutical suppliers can be incentivized and technically supported for the benefit of government hospitals' pharmaceutical supply chain improvement should be studied. In addition what type of information should be exchanged with private pharmaceutical suppliers should also be studied in order to maximize government hospitals pharmaceutical supply chain performance.

5.5. Limitation

This study was successfully undertaken but not without a few limitations. One of the big challenges the researcher faced was lack of similar studies with similar settings and concentration which leads to a challenge to get standardized questionnaire.

The other challenge was the area where government hospitals found. Government hospitals has found at far distance which leads to a challenge for the researcher during questionnaire dropping and picking. The hospitals were discovered at least two times during questionnaire dropping and picking which was time consuming, financially challenging and discomforting.

It was also an enormous challenge for the researcher to convince the respondents to participate in the study. Most of the respondents, pharmacists at managerial level, were reluctant to participate in the questionnaire for the reason that they were so busy.

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APPENDIX I: List of government hospitals in Addis Ababa, Ethiopia

Ser.no.	List oh hospitals	Service level	Location subcity
1.	Black Lion specialized hospital	specialized	Lideta
2.	Amanual specialized hospitals	Speciality center	Addis Ketema
3.	Gandhi memorial specialized hospital	Speciality center	Arada
4.	St. paul Mellinium mellinium medical college	Medical college	Gullelle
5.	Yekatit 12 hospital medical college	Medical college	Arada
6.	Minilik II comprehensive specialized referral hospital	Referral	Yeka
7.	Alert general hospital	General	Kolfe Keranio
8.	St. Peter specialized hospital	General	Gulelle
9.	Zewditu memorial general hospital	General	Kirkos
10.	Ras Desta general hospital	General	Arada
11.	Eka kotebe general hospital	General	Yeka
12.	Tirunesh beijing general hospital	General	Akaki Kaliti

APPENDIX II: Questionnaire

Letter of Introduction

Abiot Abebe

Addis Ababa, Ethiopia

Email: abi.emulove@gmail.com

Phone number 0911538405

Dear respondent

RE: LETTER OF INTRODUCTION AND QUESTIONNAIRE GUIDE

First of all I would like to thank all of you for your willingness to participate in the responding of questioner for the research.

I am Abiot Abebe, a final year master of arts in logistic and supply chain management (MA LSCM) student at Addis Ababa University College of Business and Economics School of Commerce department of Logistics and Supply Chain Management Graduate Program.

I am conducting a research on "The role of supplier development on the improvement of performance of hospitals' pharmaceutical supply chain in Addis Ababa, Ethiopia". The purpose of this study is to assess what role supplier development practice has on the improvement of hospital's pharmaceutical supply chain.

Since you are expected as having better information on the title of the study, I therefore request you to find time to respond to the attached questionnaire objectively and exhaustively.

I assure you that the information you will provide will be used for academic consumptions only and will be treated with utmost confidentiality. The instruction for filling the questionnaire is availed for each question you are selected to respond on the questionnaires prepared.

Your assistance in this matter will be highly appreciated.

Yours sincerely

Abiot Abebe

STUDENT REG.NO. GSD 8552/12

Name of your hospital ----------

SECTION I: BACKGROUND INFORMATION

1- Please indicate your gender
   Male [ ] female [ ]
2- Please indicate your level of education
   PHD [ ] masters [ ] degree [ ] diploma [ ]
3- How long have you worked in this hospital
   Below 3 years [ ] 3-6 years [ ] 6-9 years [ ] above 9 [ ]
4- Please indicate your current working area
   Pharmacy directorate [ ] DSM coordinator [ ] purchaser [ ] drug store manager [ ] Outpatient pharmacy head [ ] Inpatient pharmacy head [ ] Emergency pharmacy head [ ]
5- Your hospital purchase pharmaceutical items from
   Government suppliers (EPSA) only [ ]
   Private pharmaceuticals supplier only [ ]
   From both private and governmental suppliers [ ]

6- In your hospital the amount of pharmaceutical items purchased from private supplier is
   Very much higher than government suppliers [ ]
   Higher than government suppliers [ ]
   Moderately higher than government suppliers [ ]
   Lesser than government suppliers [ ]
   Very much lesser than government suppliers [ ]

SECTION II: SUPPLIER DEVELOPMENT PRACTICES

Supplier development practices such as incentivizing suppliers, sharing information with suppliers and supporting suppliers technically can develop supplier's performance so as to improve supply chain performance.

To what extent do you agree developing private pharmaceuticals supplier performance through incentives, information exchange and technical support improves pharmaceuticals supply chain performance? Tick on the level of your agreement for each statement in the table below.

A- Supplier incentives

To what extent do you agree with the following statements that relate to incentives? Tick on the level of your agreement for each statement in the table below

Item Code	Statement	Strongly disagree	disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
SI1	Private pharmaceutical suppliers can be incentivized by recognizing their supplying progress.					
SI2	Private pharmaceutical suppliers can be incentivized by awarding their supplying progress.					
SI3	Top managers thank you response motivate Private pharmaceutical suppliers					
SI4	Giving letter of recommendation motivate private pharmaceutical suppliers					
SI5	Cash payment upon delivery motivate private pharmaceutical suppliers					
SI6	Promising higher volume order encourage private pharmaceutical suppliers					
SI7	Incentivization motivate Private pharmaceutical suppliers to maximize their supplying progress					
SI8	Incentivization strengthen relationship between your hospital and private pharmaceutical suppliers					
SI9	incentivized supplier devoted to deliver pharmaceuticals on time so as to improve pharmaceuticals availability					
SI10	Incentivized suppliers feel responsibility to respond to our hospital's demand variation					
SI11	Providing incentives for					

	private pharmaceuticals suppliers performance encourages them to avail pharmaceuticals consistently so as to reduce stock out rate					
SI12	Incentivized suppliers are willing to respond to our excess stock so as to reduce expiry of pharmaceuticals.					

B- TECHNICAL SUPPORT

To what extent do you agree with the following statements that relate technical support? Tick on the level of your agreement for each statement in the table below

Item code	Statement	**Strongly disagree**	**disagree**	**neutral**	**agree**	**Strongly agree**
		1	**2**	**3**	**4**	**5**
TS1	Evaluating supplier's performance and communicating the result can technically support private pharmaceutical suppliers to devote to improve their performance					
TS2	Making to know your hospital's annual pharmaceutical procurement plan can technically support suppliers to improve their performance					
TS3	A clear and easily understandable technical specification of tender can technically support suppliers to improve their performance					
TS4	Evaluation provides a better view of our supplier's performance					
TS5	Suppliers' performance can be improved if they are technically supported					
TS6	Technical support strengthen relationship between your hospital and private					

	pharmaceutical suppliers					
TS7	Technically supported supplier devoted to deliver pharmaceuticals on time so as to promote pharmaceutical availability					
TS8	Technically supported suppliers feel responsibility to respond to your hospital's demand variation					
TS9	Providing technical support motivate private pharmaceutical suppliers to avail pharmaceuticals consistently so as to reduce stock out rate					
TS10	Technically supported suppliers could react to our excess stock so as to reduce pharmaceuticals expiry.					

C- INFORMATION EXCHANGE

To what extent do you agree with the following statements that relate information exchange? Tick on the level of your agreement for each statement in the table below:

Item Code	Statement	**Strongly disagree**	**disagree**	**neutral**	**agree**	**Strongly agree**
		1	**2**	**3**	**4**	**5**
IE1	Sharing demand forecast information make suppliers to think in advance to improve their supplying performance					
IE2	Sharing demand change information make suppliers to think in advance to improve their supplying performance					
IE3	Sharing inventory information make suppliers to think in advance to improve their supplying performance					
IE4	Exchanging information with suppliers encourage them for further improvement					
IE5	Information exchange strengthen relationship between your					

	hospital and suppliers					
IE6	Proper Information exchange improve on time delivery of pharmaceuticals					
IE7	Your hospital's demand variation can easily be managed by proper information exchange					
IE8	Exchanging information makes private pharmaceutical suppliers to think in advance to avail pharmaceuticals consistently so as to reduce stock out rate.					
IE9	Exchanging information with private pharmaceutical suppliers has a value to reduce unusable stock so as to reduce pharmaceutical expiry.					

SECTION III: PHARMACEUTICALS SUPPLY CHAIN PERFORMANCE

Supply chain performance is defined as the ability of the supply chain to deliver the right product to the correct location at the appropriate time at the lowest cost of logistics. Supply chain performance is the ability (of the entire supply chain) to meet end-customer needs, associated with ensuring the availability of product, deliver it on time in the right way and ensure appropriate inventory levels

To what extent do you agree developing private pharmaceuticals supplier performance through incentives, information exchange and technical support improves pharmaceuticals supply chain performance with respect to product availability and cost reduction? Tick on the level of agreement for each statement in the table below.

Ser.no.	**Statement**	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
		1	**2**	**3**	**4**	**5**
PSCP1	Introduction of Supplier development program has helped to reduce pharmaceuticals stock out rate					
PSCP2	Supplier development effort has helped to minimize the rate of pharmaceuticals expiration					

PSCP3	Demand variation can easily be managed by Supplier development program					
PSCP4	Introduction of Supplier development program minimize cost due to pharmaceuticals expiry					
PSCP5	Introduction of Supplier development program minimize expenditure on emergency purchase					