BINDURA UNIVERSITY OF SCIENCE EDUCATION
FACULTY OF COMMERCE

AN INVESTIGATION OF THE BARRIERS TO IMPLEMENTING EFFECTIVE LOGISTICS STRATEGIES IN PHARMACEUTICAL COMPANIES IN ZIMBABWE.

By

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DEDICATION

This research is dedicated to my children, Tanaka, Tapiwa and Derrick.

Abstract

This study investigated the barriers to implementing effective logistics strategies in pharmaceutical companies. Top on the priority list of any healthcare system is the delivery of drugs as a planned outcome. In the current setting of a health-conscious culture, organization of pharmaceutical supply chains becomes more complicated since it involves the saving of human lives and it therefore requires the participation of various stakeholders that include regulatory agencies, customers, wholesalers, pharmaceutical manufacturers, information service providers and distributors. Pharmaceutical supply chain studies are very limited. The main players in the supply chain of medicines are pharmaceutical companies who are susceptible to numerous risks. Risks inherent in the pharmaceutical chain affect the quality and quantity of the supplies of drugs, which in turn impacts their delivery to customers on time and to the right place. The study objectives were to identify requirements and expectations of customers/end users of pharmaceutical products, to find out measures that have been put in place to improve the movement and distribution of pharmaceuticals by pharmaceutical companies and come up with recommendations for improving the supply chain of pharmaceutical products. The results of this are based on the results of a literature review, obtaining expert opinions and a qualitative system to an improve understanding of the problem. This research will play a pivotal role in exploring the barriers that the supply chain of pharmaceuticals faces and the changing nature of the factors in the PSC that have a special role to play. The study made use of both the quantitative and qualitative approaches and employed a descriptive survey research design. Self-administered questionnaires were distributed to 20 senior logistics officers, 20 supply chain advisors and 8 logistics advisors using simple random and purposive sampling respectively. A total of 20 interviews were conducted with logistics officers, supply chain advisors and logistics advisors. The first step towards this goal is several semi-structured interviews with experts in supply chain management to explore the main challenges. The study found out that the logistics strategies that were used were inventory and return management, efficient transportation through digitisation, warehouse management, dependable suppliers, and operating expenses control. The most significant problems of PSC are inaccuracy in forecasts, long lead times, lack of optimal target stocks and high SC costs. Finally, strategic principles that are recommended include: working with suppliers, investing in new technologies, training, and development programs on logistics to improve organisational performance and establishing information technology (IT). The results can thus give PSC managers a comprehensive view of decision-making and alert them to the importance of the feedback behavior of variables in the long term and their influence on organizational

decisions and goals. It was suggested that a further study be conducted on an expanded area of the health care supply chain with a bigger sample size to enhance the generalisability of the study findings.

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LIST OF ABBREVIATIONS

PSC	Pharmaceutical Supply Chain
SCM	Supply Chain Management
SC	Supply Chain
CAGR	Compound Annual Growth Rate
3PL	Third Party Logistics
SSA	Sub-Saharan Africa
MNCs	Multi-National Companies
ETD	Estimated Times of Delivery
GDP	Gross Domestic Product
RFID	Radio Frequency Identification
WHO	World Health Organization
FDA	Food and Drug Administration
ARVs	Anti-Retrovials
UK	United Kingdom
US	United States
USA	United States of America
LPI	Logistics Procurement Index
EDLIZ	Essential Drug List of Zimbabwe
MOHCW	Ministry of Health and Child Welfare
HCSC	Healthcare Supply Chain
ICT	Information and Communication Technology
IT	Information Technology
IoT	Internet of Things
GDP	Good Distribution Practices
SPSS	Statistical Package for the Social Sciences

CHAPTER ONE

INTRODUCTION

1.0 Introduction

The background and motives of this study will be made available in this chapter. The research questions of this study will be explained from a point that is accurate and scientific. Likewise, important words that will be used in this thesis will be stated, then structure of the dissertation is presented lastly.

1.1 Background of the Study

The industry of pharmaceuticals is an integrated enterprise that comes with incompatible aims and several troublesome restrictions. An extremely regulated setting which links pharmaceutical products to an environment that is continuously changing explains the industry of pharmaceuticals as a special confronting structure. In this research a wide continuum of pharmaceutical supply chain (PSC) challenges is considered. With the cumulative changes in the organisational environment, companies must supply superior quality products, present fast responses, and make their dynamic competencies effective. Specifically, the pharmaceutical industry is realizing similar challenges that countless other industries have suffered in the past. The challenges that pharmaceutical firms are involved in are problematic and have a massive range including political, economic, social, technical, and legal consequences. Contradictory data systems and technology, incompatible company compositions and beliefs, and inadequate systems of performance measurement are limitations to the attainment of a supply chain management that is successful (Ainapur et al., 2011, p.163; Christopher, 2016, p.228).

Logistical challenges are seen as barriers to health care and can end up the in late arrivals and delayed or missed care. Shortage of necessary drugs leads to an increased prevalence of premature deaths and diseases, and a healthcare system whose growth is compromised. Addressing logistical challenges is central not only for mitigating adverse health care results among patients, but also for evading additional expenses to the health care structure stemming from the soaring use of emergency departments and hospitalizations (Hwang AS, et al 2013, Kangovi S, Barg FK, Carter T, Long JA, Shannon R, Grande D, 2013). Failure to focus on these barriers will stop the supply chain from reaching its full potential and eventually affect its total performance (Parmar & Shah, 2016, p.27; Parmenter, 2015, p.103). The goal of any

supply chain is to satisfy demand, create client value, improve responsiveness, support a good network, and enable financial success (Lysons & Farrington, 2016, p.87). The increase in the complexity of the business environment and more demanding needs are reshaping logistics and warehouse processes (Dev et al., 2021). To cope with this scenario, digitization and the application of best practices have evolved into powerful means to compete in the market and help companies address the sensitive trade-off between better service levels and affordable operating costs. Disruptions can disrupt the integration of external processes in the supply chain, leading to information distortions, stockouts, longer cycles, and whiplash. The consequence would be high overall costs and reduced customer service competencies (Wisner et al., 2018, p. 460).

Logistics and supply chain management (SCM) are two linked concepts. The Council of Supply Chain Management Professionals describes logistics management as follows:

Logistics management is that part of supply chain management that plans, implements, and controls the efficient, effective forward and reverses flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements. (Council of Supply Chain Management Professionals, 2016).

The logistics market size is projected to grow at a 4.6% compound annual growth rate (CAGR) through 2023 and was $5.6 trillion in 2018 (Transport Intelligence, 2019). In Europe, the size of the logistics market in 2019 was $0.9 trillion with a 2.4% CAGR predicted for the period 2018-2023 (Transport Intelligence, 2019) and approximately 10.3 million people were employed in 2018, thus this business is very important for the global economy (Eurostat, 2018). Within the logistics market, the key activities are in-house warehousing and third-party logistics (3PL), with 38% in Europe and 30% of the total market value (Transport Intelligence, 2019).

Logistics Facts in Sub-Saharan Africa - Africa is a region of more than 900 million people in 54 countries (Parker, H.; Luiz, J.M, 2015 (p. 65). Africa's contribution of export goods to the global market has steadily declined since 1948 from 7, 3% to about 2.2% in 2016 (Takele, T.B, 2019), which is unusually poor even though it recognizes the wealth of natural resources and agricultural products that abound in the continent. Two major regions make up Africa – the Middle East and North Africa and secondly Sub-Saharan Africa (SSA).

Two reasons are highlighted for this low commercial success – firstly, the prevailing emphasis on the international export of a small number of commodities (mining products, agricultural

products, and fuel); second, logistics and supply chain issues in the region. Several MNCs have expanded into other emerging markets but have found it difficult to penetrate SSA because logistics and supply chain costs are too high. Organizations looking to do business in Africa must therefore make it a strategic competitive priority to understand the current conditions of logistics and SCM in Africa and identify the opportunities and challenges to succeed. Economic fragmentation is high in Africa and significantly higher intra-regional in other regions – 16% in Africa, 20% in the Caribbean, 58% in Asia, 67% in Europe, 48% in North America and Latin America (Overseas Development Institute, 2021).

1.2 Statement of the Problem

Supplying high quality products and delivering fast responses are problems that are encountered by pharmaceutical companies. In a survey carried amongst pharmaceutical companies 70% of those that participated highlighted that their main challenges were accurate estimated times of delivery (ETD) and speed.

The size of the logistics market was $5.6 trillion in 2018 and is projected to grow at a compound annual growth rate (CAGR) of 4.6% through 2023 (Transport Intelligence, 2019). In Europe, the size of the logistics market in 2019 was $0.9 trillion with a 2.4% CAGR forecast for the period 2018-2023 (Transport Intelligence, 2019) and approximately 10.3 million citizens were employed in 2018, making the industry highly relevant for the global economy (Eurostat, 2018).

Pharmaceutical industries supply chain problems are not peculiar to it. Problems in the pharmaceutical industries are compounded by the nature of the pharmaceutical products as well as the economic, technical, political, social, and legal considerations during the transportation of pharmaceutical products. There are numerous factors that specifically affect pharmaceutical industry supply chain management. Delivery is time sensitive and products have short shelf lives in the pharmaceutical industry. Time is of the essence when it comes to pharmaceutical products in a lot of instances especially drugs that are required for emergencies. Pharmaceutical products by their nature should be transported in a controlled environment and not be exposed to the vagaries of weather elements. Specialised handling is required for pharmaceutical products due to their delicate nature and they cannot be combined with general cargo, to avoid contamination.

In addition to that pharmaceutical products are highly controlled by a plethora of principal and subsidiary pieces of regulations restricting, prohibiting, and controlling free movement.

Several permits and licenses are needed for their transportation and storage, causing the government to take an interest on how they are transported. From the preceding discussion several issues must be contemplated before and during transportation of pharmaceutical products. As a developing nation with a low GDP (Gross Domestic Product), Zimbabwe is not capacitated to handle time sensitive, perishable and fragile consignments due to the absence of electric power for drugs refrigeration, storerooms, poor infrastructure, and the absence of companies to handle the nature of pharmaceutical products, the complications and requirements highlighted above though they obtain globally. These special handling capabilities cannot be sustained by Zimbabwe because it has not been endowed with the technical and financial capacity. In turn it negatively affects patients as they may fail to access drugs that are in good condition timeously.

Low-income individuals and chronic patients experience more negative health care consequences and encounter more logistical barriers since they are groups that are already prone to countless social and economic disadvantages. Failure to address these problems puts more pressure on the already constrained healthcare system that is ailing due to the lack various resources.

Transportation is lengthy, complicated, and costly causing drugs sometimes to be delivered damaged and contaminated due to the negative impact of logistical barriers. Infrastructure development, automation, track, and trace using RFID (radio frequency identification) just to name a few are the numerous efforts that are being made to address these barriers. The role of this study is to offer insight into these challenges and ways to improve the logistics processes. The researcher has perceived a knowledge gap since most available research concentrates on port logistics, reverse logistics, digitization of logistics. Publications that focus on African pharmaceutical logistics are still limited and narrow.

1.3 Purpose of the Study

This study aims to bring out the supply chain logistical barriers that we can no longer turn a blind eye to in the supply chain of healthcare and come up with solutions that improve customer satisfaction by alleviating these challenges. The aim of this study is to evaluate in a systematic manner previous findings and augment them through semi-structured interviews.

1.4 Research Objectives

1) To identify requirements and expectations of customers/end users of pharmaceutical products.
2) To identify supply chain challenges encountered by pharmaceutical companies.
3) To find out measures that has been put in place to improve the movement and distribution of pharmaceuticals by pharmaceutical companies.
4) To come up with recommendations for improving the pharmaceutical products supply chain.

1.5 Research Questions

1) What are the requirements and expectations of customers/end users of pharmaceutical products?
2) What are the supply chain challenges that are encountered by pharmaceutical companies?
3) What measures have been established to improve the pharmaceutical companies' supply chain?
4) What can be recommended to improve the supply chain of pharmaceutical products?

1.6 Significance of the Study

This study intends to assist research scholars that are interested in carrying out research on the barriers to implementing effective logistics strategies in pharmaceutical companies and related areas by acting as a source of information. Outcomes of this study may assist in further research on logistics barriers to get further knowledge on related topics. Government of Zimbabwe, supply chain specialists, taxpayers and the existing body of knowledge may benefit from this study both practically and theoretically. The study of barriers to implementing effective logistics strategies in pharmaceutical companies contributes to the existing body of knowledge theory. Previous studies have focused on countries such as Malawi, India, and Nigeria therefore, literature on Zimbabwe is scarce. Therefore, this study will address that gap.

1.7 Assumptions

The study will be conducted on the following assumptions:

- Safety stock levels are sufficient to mitigate supply chain disruption risk.
- Research participants answer the research questions in an honest, truthful, and unbiased manner.
- Secondary data relevant for the research was available.

- The answers obtained from the respondents are a true reflection about their perceptions of the effect of logistics barriers on pharmaceutical supply chains.

1.8 Delimitations of the study

1.8.1 Time Scope

The research focused on the period from November 2021 to December 2022 because that is the period when pharmaceutical companies were experiencing shortages of drugs exacerbated by logistical challenges. The research will be limited to the barriers to implementing effective logistics strategies in pharmaceutical companies. The study will also assess how the various logistics barriers affect organisational performance.

1.8.2 Geographic scope

The study targeted people who work in logistics departments because of their expertise. This study aims to investigate the barriers to implementing effective logistics strategies in pharmaceutical companies. The study will gather information from pharmaceutical wholesalers within Zimbabwe. Pharmaceutical wholesalers that will be used in the research are those that are based in Harare, the capital city of Zimbabwe because that is where head offices for most of these wholesalers are located. While various health institutions ranging from retail pharmacies, hospitals have been impacted by logistics barriers they will not be incorporated into this study. Outside Harare the logistics officers will receive the questionnaires electronically due to the challenges of coordinating the suppliers for the distribution of questionnaires outside Harare. It is assumed that the challenges that affect the logistic function in Harare affect other cities and towns in Zimbabwe, therefore the outcome and analysis will be helpful to all logistics units and sub-units within Zimbabwe.

1.9 Limitations

The study faced the following limitations.

The main limitation of the research is that it is conducted in one business area but the questionnaire for the survey can be extended to other industries in the future. Limitation number two of the research is that it is only fixed on the supply chain of pharmaceuticals, which is a small part of the entire health care supply chain, and therefore requires additional research reporting on several other areas of the health care supply chain. The sample for the study survey was chosen from each company by selecting one individual at a particular point in time which

could lead to results that are biased. Therefore, subsequent research needs to collect information from more organizational members.

1.9.1 Budget Constraints

Budgetary constraints hindered the gathering of statistics and information from original sources due to insufficient budget allocations. This becomes important when an area of study extends to various cities. This was overcome however using a strict budget using personal funds. Minimization of costs was achieved through the distribution of questionnaires electronically to minimise transport costs.

1.10 Definition of terms

A supply chain is a network of organisations and individuals that directly contribute to the activities that bring in materials into an organisation (upstream) and in which materials (mostly finished products/goods/services) flow away from the organisation to the ultimate customer (downstream). There is also a related flow of finances and information within this network (Mentzer et al., 2001).

Supply chain management (SCM) it is the coordinated & strategic management of the traditional functions of the business and approaches used within these business functions in a particular organisation that is focused on how goods and services flow to and from an organisation, including processes that transform components and raw materials into the end-product within the supply chain. The purpose of this is to improve performance in the supply chain in the long term (Mentzer et al., 2001).

Logistics is a subset of supply chain management that is involved in planning, controlling, and executing in a well-organised, functional manner the reverse and forward movement, goods storage, services, and information related to these activities from the point it originates and to the point it is consumed so that the requirements of the customer are met (Council of Supply Chain Management Professionals, 2016).

Pharmaceutical – drug or medicine that is prepared, dispensed, or used in medical treatment.

Medicine – it is a preparation or drug that is used for prophylaxis or therapy.

Pharmaceutical industry – it is a complicated set of procedures, operations and companies that are concerned with the production, research and design of medicines and drugs.

Pharmaceutical supply chain - Handfield and Nichols (1999) defined pharmaceutical supply chain as "the combination of all the undertakings associated with the movement of and conversion of raw materials to drugs or medicines and delivery to the ultimate customer, including the flow of information associated with it as well, this is achieved by improving relationships in the supply chain to attain long term competitive advantage.

Drug - The World Health Organisation (WHO) defines a drug or pharmaceutical preparation as: any ingredient or combination of ingredients produced, retailed, presented for sale, or displayed for usage in the identification, therapy, reduction or prophylaxis of disease, uncommon physical state or for any indications found in animals or men; (and in use for) reinstating, rectifying, or altering biological functions in humans or animals.

Healthcare logistics implies activities of logistics that are delivered within a health care set up.

A barrier is a hindrance or subject that an organisation or individual faces that stands as an obstacle to attaining a goal.

An improvement means to make something better through transformation. This study will not limit improvements to a type of improvement that is special such as quality or cost, but to something that is seen as better in comparison to its former state of things. Nonetheless, in this study the improvement types that are of interest are the ones that are done by people who are involved in decision making and by employees in pharmaceutical companies.

Quality is described as the overall support of the needs of the customer when it's related in terms of logistics, on-time delivery, and transactions that are free from errors. This meaning is centered on the conclusions by Sohal et al. who investigated logistics quality for companies in Europe, Australia, and North America (Sohal et al., 1999). According to Callender and Grasman, they assert that the key function of any supply chain in health care is to distribute products timeously to satisfy the provider's needs (Callender and Grasman, 2010).

1.11 Summary

This chapter outlines the problem under study and its setting, the study background, problem statement, significance of the study, the research objectives, research questions, assumptions, delimitations, and definition of terms and limitations of the research encountered. The research has been driven by the recent poor supply chain performance by pharmaceutical companies due to the impact of logistics barriers. Although the country is seeking to support the local manufacturers, they are failing to supply goods and services that meet and enable high financial and non-financial organisational performance. The limitations encountered include the difficulty in getting respondents in the designated locations. Related literature was reviewed to improve an understanding of the problem. The following chapter of the study reviews related literature.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The preceding chapter presented the problem and its context. Supply chains and the impact of logistics barriers in implementing effective logistics strategies (as well as some provisional steps which are being taken to address these challenges) will be deliberated on in this chapter. As stated by Ridley (2012), the word literature review makes reference to an evaluative and critical study of information connected to a selected area of study. Data analysis part of the research will focus particularly on the logistics of Pharmaceutical Companies; the literature will take up a broad focus on logistics all over the globe. This is to track on-going happenings and study and intensify teachings from the wider supply chain sector. The chapter lays out the views of several authors on the parts highlighted in the research objectives. In this regard, several logistics barriers will be pointed out and their impact on organizational performance. The chapter will examine important areas where experts connect and separate on these matters. Comprehensively, this chapter assists the researcher to comprehend the field of research.

2.1 Literature Review

Pharmaceutical supply chains will be investigated as a very broad topic in this academic research. Pharmaceutical supply chains differ from physical goods supply chains because of their significance, shipment, urgency, storage, and laws that govern them. Margin of error in pharmaceutical supply chains is razor thin. Any disruption to the delivery of medications or critical drug products puts the overall health, well-being and patient's lives at stake.

Whewell (2009) states that, the different stages of development, drug design, distribution, production, and implementation through a variety of health care services and additional companies assist in the successful functioning of the drug supply chain. The following nodes constitute a pharmaceutical supply chain: (i) wholesalers; (ii) market warehouses/distribution centres; (iii) retailers/hospitals; (iv) main producer (contractor sites included); and (v) secondary producers (contractor sites included). In this sector a significant role is played by wholesalers. They are usually few and large. Demand flows of about 80% in the UK go through this channel (where there's a trio that accounts for virtually all the needs) the remaining greater part then goes to hospitals.

The highest priority should be placed on pharmaceutical products logistics since this is concerned with the existence and demise of animals and men covering the globe.

Pharmaceutical industry has activities that are time bound and highly sensitive to quality and therefore logistics is regarded as important part of it. Disruption due to logistical barriers in the pharmaceutical supply chain takes place at all functional levels of the supply chain including freight and logistics, procurement, manufacturing, service delivery and health systems.

The distribution of pharmaceutical products requires temperature-controlled storage under strict regulatory control. The industry has placed importance on logistics over time by focusing on logistic and supply chain level activities, for example delivering the drugs to the ultimate customer at the proper place, right time, at a competitive operational cost and in a secure form. Bradley and Weber (Bradley and Weber, 2004) have provided a comprehensive aspect of the drug industry guided by statistics in the industry.

Ricci (2006) recognised the significance of medical companies having command of their own delivery to exploit the different channels and the potential they offer to safeguard sick people from mistakes and faults that can take place during repackaging and labelling. Challenges experienced by other industries in the past are the same ones that the pharmaceutical industry faces. Political, economic, social, technical, and legal considerations are the extensive range of challenges faced by Pharma companies and which complicate it. PSC comprises of companies that deliver and supply drugs which have an important impact on customer satisfaction (Handfield R.B & Nichols E.L, 2002). Only the companies that are ready to welcome changes and improve their approaches will realise long term success (Baines DA, 2010).

Research by Oliver Eitelwein indicates that several pharmaceutical companies must improve the main supply chain segments including forecasting, inventory level, customer satisfaction, accuracy, and total supply chain costs. Also, he says that the products are complex in nature and the processes, making them important matters to consider since a various number of causes can emerge in distribution networks, regulatory restrictions, the large finished good portfolio, capacity constraints, wide variety of materials needed, high investment cost and time of developing new products (Eitelwein O, 2014).

The Kaiser Family Foundation report is an example of one of the few industry reports that discusses the pharmaceutical supply chain in detail (Kaiser, 2005), IBM reports (IBM, 2003), (IBM, 2004a) (IBM, 2004b), and (IBM, 2004c). Lately, security of the drug supply chain has become a topical issue and there have been numerous areas highlighting its value and susceptibility (AHSP, 2002a). Shortages have become a critically important problem in the industry of pharmaceuticals, alongside the security concerns (AHSP, 2002b). Counterfeits are an issue that is discussed at length by FDA (FDA, 2004).

The gap between the theory and scholarly literature in the logistics of pharmaceuticals covering pharmaceutical companies particularly in Africa is substantial. A handful of findings have concentrated on the drug supply chain concept, with a significant number of publications discussing enabling technologies and their application in logistics, port logistics and reverse logistics. Journals on Zimbabwean pharmaceutical logistics are still thought to be narrow and limited. Current and detailed analysis publications which are scientific should be presented in a structured style portraying statistics that an accurate study of SCM (supply chain management) across the regions.

2.1.1 Global logistics

The pharmaceutical industry requires a safe, efficient, and tight supply chain because it is a global business more than $500 billion. Ingredients and materials of modern pharmaceutical products are relied upon from across the globe (Kaye, 2010). India is the leading and biggest supplier of generically manufactured drugs globally. Fifty percent (50%) of the international requirements for several vaccines (including ARVs), 25 percent of all medicines in the UK and 40 percent of generic demand in the US is supplied by the Indian pharmaceutical sector. In the global pharmaceutical sector India enjoys an important part. Against such a backdrop, the logistics sector of India has been experiencing a substantial growth never seen before. Government policies have been enabling in nurturing the development of the Indian logistics sector, as the state machine, including all levels of the government, which are still influential powers in driving and shaping economic changes, with the logistics sector being no exception. The delivery of drugs should be continuous to avoid the disruption of supplies which can have adverse effects on drug security, which is connected to the country's overall economy.

By 2025 there is an expected increase in size of the pharmaceutical sector in India running into about 100 billion United States dollars, while the market of medical devices is anticipated to have a growth of US$25 billion. In 2019 the national pharmaceutical earnings of India amounted to Rs 1.4 lakh crore (US$ 20.3 billion), which was a 9.8 percent increase from the previous year that is Rs 129, 015 crore (18.12 billion United States dollars). In terms of volume the market of pharmaceuticals in India sits on the third position as the largest and in terms of value it is the thirteenth largest. Indian pharmaceutical exports stood at US$ 20.7 billion 2019-2020. India has modern state of the art technology US-FDA compliant plants which are the largest number outside of the USA. Exports from India's pharmaceutical industry is directed

to various developing and developed countries like UK, South Africa, Russia, US, Bangladesh, Nepal etc.

2.1.2 Logistics Realities in Sub-Saharan Africa

The population of the African continent across 54 countries is 900 million (Parker, H.; Luiz, J.M, 2015) (p. 65). There has been a steady decline from 7.3% to about 2.2% in 2016 of Africa's merchandise export contribution since 1948 (Takele, T.B., 2019), this is exceptionally poor considering that the abundant of natural resources wealth and products from agriculture are found on this continent. The costs of logistics and supply chain are very high which has made it difficult for several multinational companies expanding into emerging markets to penetrate SSA. Therefore, it is important for organisations that intend to expand their businesses into Africa to make it a strategic competitive priority to understand the current logistics and supply chain management patterns in Africa then recognise the opportunities and challenges to prosper.

Financial disintegration in Africa has increased and inter-regional trade is considerably on the rise in other countries—58% Asia, Europe 67%, 16% Africa, 48% in North and Latin America, 20% Caribbean (Overseas Development Institute, 2021). Several factors contribute to the low trade which include corruption, regional conflict, excessive tariffs, poor logistical infrastructure, non-tariff barriers and so on. Quotas, monopolies, customs procedures and regulations, price-fixing (several rates of exchange, allocation of foreign exchange), anti-dumping or countervailing measures and subsidies are non-tariff barriers measures (Matthee, M.; Naude, W, 2007/11).

Common in sub-Saharan countries is a stiff regulatory environment since most of the countries have no enabling policies and regulations for transportation, logistic infrastructure, business practice, customs processes. This limits the efficient and smooth movement of cargo connecting different countries because the logistics resources suffer greatly across SSA regions. There has been little progress that has been recorded across the six countries in SSA for the past two decades because the policies that were being used are the ones that were enacted in the 1990s, this was revealed by a policy review of transport that concentrated on maritime, port and road freight (Muogboh, O.S.; Ojadi, F. 2018) (p. 53). The legal movement of goods through Benin, Niger, Cameroon, and Chad was effectively blocked by the Nigerian

Government in 2019 to control smuggling that before had been prevalent due to import restrictions by closing its land borders.

West and Central Africa have similar predominant logistics scenarios which include corruption, poor infrastructure, bureaucratic bottlenecks, and inefficiency. Export competitiveness in West and Central Africa has been reduced due to inefficient and high-cost logistics that is hindering growth, driving up import prices and increasing isolation of landlocked countries (Nathan Associates Inc., 2017). Cote d'Ivoire is the best ranked country within West and Central Africa at number 50 globally, according to the 2018 LPI World Bank rankings (Jaja, C, 2019), other countries on the list rank much lower. Almost all these countries have poorly maintained road networks which have led to massive traffic congestions at ports and expensive delays; in addition to that they have very boring customs clearing procedures which are inefficient and pricey.

Poor customs performance, corruption, huge trucking activity, multiple checkpoints and bottlenecks from traffic gridlock still cause extensive impediments in Nigeria where partial privatisation and management franchises of seaports has enhanced the overall outcome and competences (Nigeria Port Assessment, 2021).

Critical logistics issues affecting the region include: (i) western and central African air transport until now has been considered fragile although there have been current positive indications such as policy deregulation, negotiation, and refinancing. (ii) Road system - in several West African parts the road network system is dysfunctional due to other hidden costs, bad construction, poor maintenance of roads, bureaucratic challenges, and corrupt allocation of budgets. Transport prices increase significantly during the wet season because transporters may refuse to go in certain areas due to bad roads. Major cities, towns and villages in Ghana are connected because the road transport is significantly better therefore effectively linking agricultural production areas with local and regional markets. (iii) Militancy and Insecurity (vi) Information asymmetry: This is caused by the unavailability of supporting infrastructure and limited telecommunications infrastructure such as stable electricity which significantly increase the operation and delivery costs. (v) Rail systems infrastructure: the existent railway lines across the sub-region were built during the era of colonisation (late 19th (nineteenth) century) for example in Nigeria and they are mostly dysfunctional. More pressure has been added on to the available road networks that are already limited in terms of traffic volume. For example, in Nigeria the major challenges facing the airline industry include poor management,

obsolete facilities, absence of a coherent transport policy, weak security and air crashes (Faajir, A.; Zidan, Z.H, 2016). Corruption and Inconsistent Fiscal Policies: Corruption and inconsistent government policy directions have severely impacted the entire economies across West and Central Africa (Osabiyi, K.E.; Oladipo, A.O.; Olofin, O.P, 2017). The environment within the regulatory arm of various of SSA parts is antagonistic, especially in connection to transportation services, duty processes, logistics infrastructure which is not adequately conducive for effective business.

The index for logistics performance by the World bank in 2018 for Africa ranked South Africa highest and 33rd globally. South Africa has a well-integrated intermodal system of transportation which assists in reducing logistics stress and improving efficiency, therefore making it a favoured gateway to the rest of the continent. Personnel, the increasing cost of operational infrastructure and rising costs of transportation have become pressing concerns for South African logistics. South Africa boasts of good infrastructure which isn't properly serviced or expanded to cater for the demand, and substandard processes such as the absence of connection among numerous departments which leads to bad planning, lack of accountability and inefficiencies (Badenhorst-Weiss, J.A.; Waugh, B.J, 2015). The 2014 Barloworld logistics report recognised that the topmost constraint of the South African supply chain was a lack of skilled manpower – especially in engineering, communications, and the supply chain (Barloworld Logistics, 2014).

2.1.3 Pharmaceutical Supply Chain in Zimbabwe

The management of supply chains (Supply chain management, SCM) is a well-made and developed scholarly discipline, but in developing and low-income nations it is not applied effectively which results in ineffectual and inefficient delivery of good health to patients. Inefficient procurement, logistics and supply chain management of vital medicines remains a challenge therefore making availability an issue due inadequate funding as stated by the NDS 1 2021-2025 page 164. Low availability of medicines remains a characteristic of government funded programmes, for example NCDs (non-communicable diseases) and mental health drugs. Specialist care medicines and surgical sundries are also in short supply.

Categories in the Essential Drugs List of Zimbabwe (EDLIZ) for essential drugs and surgical sundries dwindled within the same timeframe and specifically in 2008, with 29% and 58% for vital drugs and 22% and 36% for other categories. The basket of challenges for the health sector

kept adding on due to the unavailability of communication and transport (MOHCW 2009-2013). The health sector has inadequate financing in addition to the above challenges with the present budgetary allocation roughly at US$7 per capita per annum against the World Health Organisation goal of at least US$34 (MOHCW 2008-2013).

The structure of the healthcare supply chain (HCSC) has been discussed by Yadav (2015) and the basic reasons that sidetrack and reduce the performance of the healthcare supply chain structure. Medical devices, vaccines and medicines are an important part of the healthcare system and their delivery in developing countries is affected by ineffective supply chains. These challenges in the healthcare system various sectors can only be overcome by the implementation of effectual pharmaceutical supply chains.

The economy of Portugal fell in the year 1994 becoming the country with worst economy in Europe. Santana (2002) analyzed that the people who were affected were those that are poverty stricken, on social separation and social disallowance in the Portuguese community which in turn affected the health of women, ethnic minorities, primary children and homeless.

The supply chain of pharmaceuticals has ten top global challenges that were identified by the investigation carried out by Privett and Gonsalvez (2014) are: Shipment visibility, Shortage avoidance, Order management, Temperature control, Expiration, Lack of coordination, and Absence of demand information, Inventory management, Human resource dependency and Warehouse management. The supply chain of pharmaceutical companies is very complex, and they must control the operational threats of interacting and working using many vendors who contribute the raw materials and additive excipients of drug manufacturing. The author has also highlighted opportunities that can drive policies in the future, research, and actions for companies in the pharmaceutical industry. They also pointed out measures which can be taken to increase the distribution of pharmaceuticals in areas that need it.

2.1.4 Logistics factors affecting Pharmaceutical Companies

Therefore, the above literature demands a re-look into the actual challenges that are in the logistics of pharmaceutical companies. The main challenges are related to human resources and skills, quality, complexity, costs, inventory management, Temperature control, transport, SC integration and regulatory requirements.

2.1.5 Complexity and uniqueness of pharmaceutical logistics

The complexity and unique nature of the logistics of pharmaceutical companies should be appreciated. Gupta and Ramesh (2015) have discussed the subject of the health care in India

with regards to supply chain management and about the performance reduction in pharmaceutical supply chains due to dynamic factors. As emphasized by Feander and Dassu, (2014:2) the requirements of the pharmaceutical supply chain is of a highly technical component nature which makes their logistics a challenge and the presence technocrats who dominate it by influencing purchasing decisions worsen it further. While logistics professionals are not expected to know pharmaceutical products in great detail, it is imperative that formal constructs are established which enhance cooperative working between the logistics professionals and technical team so that robust logistics strategies are developed (Feander and Dassu, 2014:2).

2.1.6 Inadequate use of logistics Infrastructure

In pharmaceutical companies some of the processes are completely manual because the use of ICT (Information and Communication Technology) is still in its infancy in logistics and supply chain networks. Dubey and Kumar (2007) pointed out that the medicine industry is hampered by management information systems that cannot freely share information and an overall deficiency of reliable and timeous information because of ancient trading practices and corporate models. Simchi-Levi, Kaminsky and Simchi-Levi (2008:407) clearly emphasized that Information and Communication Technology (ICT) is an important enabler for successful supply chain management.

Pharmaceutical inventory level forecasts are primarily based on experience rather than being data generated, according to Kanyoma and Khomba (2013:29). This approach is a problem because it gives rise to excess stock being held and can result in the expiry of expensive pharmaceuticals. Dynamic internal and external environment, multiple stakeholders are factors that could be contributing to the difficult use of ICT (Information and Communication Technology) tools. In addition to the impediments mentioned above for the adoption of IT tools, there are mistrust challenges that have been highlighted by some studies which hinder effectiveness of the supply chain (Wilding 2008). Trust goes before co-operation and collaboration in supply chain networks.

Chopra and Mendel (2005) opinionated that, to reliably and robustly improve the safety of patients and to turn out to be more demand-led, the supply chain of pharmaceuticals requires a universal innovative framework that comprises: information sharing infrastructure to put up with effective management of costs and recovery of data; item-level data management; a reliable and trusted domain that determines people with access to information, what could be

done with information provided or accessed, standards for data that is available and in what way it will be accessed and preserved and whether the data availed can be verified as authentic. To improve visibility of contract compliance, reverse logistics and consumer demand, Dubey, and Kumar (2005), specified that it needs distinctive identifiers in packaging or labels on the product. They additionally expressed that barcode innovations allow bundles to have a distinctive identifier, which when combined with infrastructure scanners can produce information of the circumstances pertaining to the products. Event repositories store data: they can be in the form of a central single event repository or a network of local event repositories that are extended to other geographies and strategic business units with the organisation.

2.1.7 Information

Information is not given the place it deserves as a major supply chain driver, Chopra and Meindl (2004:61) have pointed out the fact that facilities, transportation and inventory have a physical presence whilst information does not have a physical presence. This must not diminish the critical part of information as a driver. Nevertheless, it is imperative to note that Simchi-Levi, Kaminsky and Simchi- Levi (2008:143) appear to have covered some very significant features of information. Mistrust within the SC (supply chain) exists which motivates the unwillingness to share data within the supply chain network that unwillingness is also a major challenge. This happens because supply chain network partners do not understand how the information is going to be used when shared. Part of their fear emanates from the fact that they are afraid that the information will be shared with competitors. Accurate information shared enables a supply chain network design and plan that is effective and efficient.

Forecasting and information sharing are best used to address demand variability challenges (Bullwhip or the Forester Effect). Information sharing enables coordination and integration making it an important aspect of supply chain performance and a key driver. Advance contracts and capacity reservation contracts have been proposed as a way to facilitate and incentivize information sharing (Simchi-Levi, Kaminsky and Simchi-Levi (2008:162). This will permit correct and valuable information to be released by the supply chain partners.

2.1.8 Financing in pharmaceutical logistics

Low and middle-income nations specifically face challenges when it comes to financing procurements. Effective logistics is hindered by the irregularities in the timing and disbursement of money (Cohen, Reeh and Neroutsos, 2011:7). Vaccines and pharmaceuticals were categorized as donor funded and this is where the problem of inadequate funds stems

from (Woodle, 2000) responsibility has now been shifted to host governments and financial resources are not sufficient to procure the products required. Payment of suppliers is delayed, and appropriate quantities of drugs are not ordered due to the untimely disbursement of funds. Late payments bring about higher prices and adversarial supply chain relationships. In addition, execution and proper procurement planning is hindered by the irregular payment of funds from the Reserve bank, in some countries like Uganda at the end of every fiscal year sufficient funds accumulate. Yet again, funds that have not been used within the given fiscal year cannot be rolled over into the next year.

2.1.9 Temperature Controlled Logistics

Temperature controlled logistics relates to the transportation, distribution, and storage of cargo that is temperature sensitive, for example insulins, vaccines, and other medical products. Temperatures throughout the supply chain have to remain the same i.e. controlled – in order to ensure quality from packaging of the parcel to maintenance of the cold chain till it passes over to its final destination. Temperature variations are the root cause of spoilage, degradation and hazards to products which can lead to financial losses. Safety of pharmaceuticals is important and can only be assured through temperature monitoring.

Manufacturers of pharmaceuticals all the time can deliver quality – nonetheless this ability shouldn't be taken for granted. The problem of quality failure in long-distance consignments cannot be discovered early enough to avoid serious disruption and is much greater than a local one. Pharmaceuticals lose their efficacy when temperature is compromised and when these products are consumed or used it can lead to severe health consequences. Comprehensive quality control is now a requirement by companies that suppliers should have, in addition to detailed specification and engineering integration.

The temperatures and environmental conditions in Africa differ since it is a vast continent with temperatures ranging between 25 degrees to 50 degrees in different places. Drug manufacturers are faced with a whole set of different challenges to ensure that drugs maintain their requisite temperatures along the supply chain (Bourke, 2013). Loss of efficacy occurs when the prescribed temperatures of drugs is not maintained. Expensive drugs often need stringent transport and cold storage, and they are frequently earmarked by people interested in counterfeiter drugs because they are expensive.

Vital conditions monitoring has become more accurate and reliable because of the deployment of IoT humidity and temperature data loggers solutions which have revolutionised cold chain monitoring. High value pharmaceuticals and perishables require an appropriate transportation

mode which is ideal (air transport or refrigerated trucks). Skill development, training and compliance can also improve the cold chain.

2.1.10 The Regulatory System

Heavy regulation is what guides the pharmaceutical industry. The supply chain of pharmaceutical has goals, as indicated by Chopra and Mendel (2005), which is to ensure safety of products and regulatory compliance, but also meet the needs of consumers by being more responsive through leveraging information. They recognised that, the distinctive nature of the supply chain of pharmaceuticals faces challenges of handling multifaceted information for supply chain efficiency; nonetheless there are obviously significant benefits for doing so. All the main actors in the pharmaceutical business are subject to regulatory controls – the wholesalers, retailers, manufacturers, and prescribing physicians. State, Federal and local authorities impose important compliance regulations on pharmaceutical companies that they have to face. The three (3) primary objectives pursued by regulatory control are: controlling the quantity, ensuring the safety of drugs consumed by the public; and quality of drug expenditures.

The pharmaceutical industry requires effective and realistic laws and regulation because: (i) Informal controls are inadequate (ii) Pharmaceuticals concern the whole population; (iii) Serious repercussions can occur from the misuse or lack of medicines, including injury and death; (iv) Numerous parties are associated with it: manufacturers, wholesalers, distributors, health providers and patients; (v) The customer has no way of determining quality of the product.

Regulatory authorities are usually set up to direct administrative controls (Saranga H, Phani BV, 2009). Death, therapeutic failure, resistance to medicines or exacerbation of disease is a result of using ineffective medicines. Governments need to establish national regulatory authorities, approve inclusive regulation and laws in order to protect the health of the public and ensure that the public has access to medicine information that is accurate. Regulatory authorities also monitor the appropriate use of medicines, trade and manufacture.

2.1.11 Transportation

It is more complicated to transport pharmaceutical products than products for everyday use. Svantesson (2009) asserted that since pharmaceuticals are high value goods they require processes which are safe at all centres of activity in the supply chain, with harmonized safety measures that must be thoroughly checked on its working lines with loading/unloading places

and sub-warehouses. He additionally specified the significance of using a few loading/unloading places and modes of transport change for a safe solution and timesaving, at a minimised price level.

The uses of improper shipping mode, mishandling and improper temperature controls are pharmaceutical supply chain key transportation problems. Road transport system is the mode of transport used by most pharmaceutical companies for distribution and it is a challenge. The road infrastructure in Zimbabwe is very poor and creates a hurdle in the distribution of pharmaceuticals. Healthcare centres that are connected cannot be accessed, therefore investment in suitable vehicles and collaboration with third party transport service providers to supply appropriate type of vehicles that can get to most rural healthcare facilities and difficult-to-reach areas. Licensed supply chains are mandated to supply medicines according to good distribution practices (GDP) and the drugs should be consistently transported, handled, and stored in conditions that are suitable for the product requirements (Singh et al., 2016, p.10).

Central to the transportation of drugs is that: (i) freight forwarders used by drug importers should have extensive experience in the transportation of pharmaceuticals and use good distribution practices as a working tool. (ii) Familiarity with the legal regulations governing the transportation of drugs and their specific requirements is important for both exporters and importers. (iii) During transportation from the warehouse to the recipient, drugs should be stored at the same temperature and humidity and controlled with appropriate sensors on an on-going basis. (iv) Drugs should not be exposed to harsh external factors or other medicines but should be packed in special packaging, for example, refrigerated containers or Styrofoam isothermal packaging. (v) Documentation of the whole journey is a necessity as well as any potential inadequacies. It is important because drugs that are not properly stored can have adverse effects on people's health or life.

2.1.12 Lack of skilled Human resources

Inventories of wholesalers, manufacturers, pharmacies etc. is affected by poor decision making and unskilled staff that plan poorly therefore creating a system that is weak which ultimately affects everyone in the pharmaceutical supply chain from the producer to the ultimate customer i.e. patients then face numerous problems with regards to their treatments and demands (Vian, 2003). Lack of skilled staff in the supply chain of pharmaceuticals can produce a faulty and weak system design in an area where skill and experience is necessary and therefore lead to theory versus experimental mismatch.

When demand planning data in all stages of the supply chain of pharmaceuticals is not collected in the right format it creates capacity gaps. Lack of adequate staff to gather data affects the capacity to compile data accurately. This then leads to either under stocking or over stocking. People that carry out forecasting and quantification should be capacitated. It aligns with Gibson et al. (2016, p.477), who recommended organisations to increase the competence of their staffs i.e. inventory planners by spending a significant amount of time on this activity.

Pharmaceutical supply chains lack staff with the suitable knowledge and expertise to handle the proper storage and handling of drugs. It is important that companies provide continuous professional development and on-the-job training.

Private hospitals in Malaysia were facing inventory management problems in their logistics and distribution of drugs from wholesalers to clinics (Mustaffa & Potter, 2009). There is a lack of expert human resources within the pharmaceutical supply chain warehouses who are responsible for inventory management. This is because people who are allocated to oversee stocks do not place importance on the management of inventory, for example warehouse managers and qualified personnel place management of inventory at the bottom of their to-do-list. It remains a challenge because some of these workers lack inventory management knowledge. This can be the result of uncoordinated human resources in an organisation whose consequences become visible in pharmaceutical companies, and ultimately throughout the healthcare supply chain (Perron, 2005). There is a need to engage qualified personnel in inventory management.

Financial success is achieved by those organisations that do exceptionally well in their operations within the supply chain. Excellence in the supply chain which improves accuracy of demand forecasts steers profit margins to 5% higher, 15% fewer stock, equal to 17% “flawless order” stronger rankings, plus 35% reduced cycle times of money-to-money (VeriSign Inc., 20 06). As mentioned by Chopra and Mendel (2005), Consumer Products (CP) Industry provides most of these findings; this is where consumer demand is tightly aligned to operations to achieve supply chain excellence and become demand driven.

2.1.13 Inadequate capacity of suppliers/manufacturers

Basu et al. (2012, p.19) have discovered least-developed countries cannot provide health-promoting and lifesaving drugs which are the necessities of their populaces. Southeast Asian countries, or Western countries manufacture most of the specialised and generic drugs. Furthermore, selected countries, including Zimbabwe, rely on imports and donations because they do not have the manufacturing capacity for medicines.

Pharmaceutical companies cannot secure all their drug procurements from local manufacturers because they have inadequate capacity which is a huge barrier. It has been noted that manufacturers and foreign suppliers monopolise the domestic pharmaceutical market because of the inadequate capacity of the local industry. Hence, a suggestion has come through that indigenous pharmaceutical producers must be supported to empower them to manufacture generic drugs. The support that can be given includes funds, stock, duty free and equipment.

2.1.14 Inadequate storage

Storage space that is inadequate is a barrier that has been noted. This might be because of a lack of sufficient financial resources, space, and regulatory requirements. Pharmaceuticals require adequate storage space so that the current and future requirements of the country are met. It has been noted that abundant storage space is required for the movement of materials, packing commodities and warehousing handling equipment for picking not only for storage. Pharmaceutical companies whose warehouses that do not have sufficient space end up piling drugs and damaging some products, while some stocks will expire due crowded spaces and inaccessibility. To meet the current and future needs of customers pharmaceutical companies need to rethink their storage spaces. Pharmaceutical companies keep the same warehouses even though the populace is growing at an annual rate of 3%. There is a need for pharmaceutical companies to seriously modernize and increase their storage space. Expansion of storage spaces can only be made possible if regulatory requirements are accommodating and resources are made available.

2.2 Summary

This chapter covered the literature related to an investigation of the barriers to implementing effective logistics strategies in pharmaceutical companies in Zimbabwe as directed by objectives of the research. The views of other authors on the logistics barriers were covered looking at the areas on which the authorities converge and diverge. In this regard, the chapter looked at logistics barriers in general and SC (supply chain) of pharmaceuticals, and improvement of gaps in the supply chain. The gap between the theory and scholarly literature in the logistics of pharmaceuticals covering pharmaceutical companies particularly in Africa is substantial. A handful of findings have concentrated on the drug supply chain concept, with a significant number of publications discussing enabling technologies and their application in logistics, port logistics and reverse logistics. Journals on Zimbabwean pharmaceutical logistics

are still thought to be narrow and limited. The following chapter covers the research methodology for the study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

The preceding chapter outlined the views of several experts on the objectives associated with this study. This chapter will focus on the methodological procedures of the study which will be outlined along with the methods that will be utilised in managing the study. Related to this, the chapter will also explain the research philosophy and research design that guided the study. The population that is targeted, size of the sample and methods of sampling used to select the study respondents will also be clarified. In addition, this chapter will thoroughly explore data sources, research tools for field data collection, and pilot testing exercises. Before concluding the chapter with a chapter summary, reliability and validity of the study, data presentation, analysis techniques, and ethical considerations identified in the study are presented. Explanations are provided for the choices made by the researcher.

Non-probability sampling is used in the study. Selective or judgmental sampling was used, and it is a technique that relies on the researcher's judgment in choosing who to ask to participate. A representative sample is implicitly chosen by the researcher according to their needs by specifically approaching individuals with characteristics that suit their needs. Judgment sampling is time-and cost-effective to perform and therefore advantageous, at the same time resulting in a variety of responses (particularly important in qualitative research). This will also snowball to other key holders of information. The research protocol and ethical consent followed in the study is clearly detailed.

3.1 Research Design

In terms of design of the research, a cross-sectional approach and a research design that is descriptive was adopted. A research design is a strategy chosen to bring together the various parts of research in a clear and coherent manner to ensure an effective solution to the research problem (Ritchie et.al 2013). Descriptive research is an investigation designed to accurately portray respondents or participants. It provides a description of the prevailing situation so that the investigator has no power to direct the variables under study but can report what has happened or is taking place. The survey used a design that was descriptive because it was appropriate for the current academic work since the investigator intended to explore the barriers to implementing effective logistics strategies in pharmaceutical companies without having to manipulate matters on the ground.

The strategy used in the survey helped ensure that the researcher contacted many research subjects to find out the barriers to implementing effective logistics strategies in pharmaceutical companies. According to Rubin and Babbie (2016), the time horizon of a research makes reference to the time frame the study is intended to be completed. The researcher chooses a

cross-sectional approach because the data for the study will be collected only once without repeating the collection at certain intervals. In this study, therefore, an overview of the barriers to the implementation of effective logistics strategies will be considered.

3.2 Subjects (Population and Sampling)

Population and sampling techniques are covered in this section of the academic work.

3.2.1 Target Population

Smith (2015) defines target population as a homogeneous group of individuals with characteristics that appeal to the researcher. The population that was targeted for this study was 55 as displayed in Table 3.1.

Table 3.1 Target Population

Target Respondents	**Population Size**
Senior Logistics Officers	25
Supply Chain Advisor	20
Logistics Manager	10
Total	**55**

Source: Primary Data 2023

Senior Logistics officers are part of the target population because they are actively involved in the logistics process in pharmaceutical companies and can better understand the obstacles to implementing effective logistics strategies in pharmaceutical companies. Supply chain advisors were also involved as they are closely involved in the organization's pharmaceutical product logistics. Logistics managers were included in the target population to understand potential supply-side bottlenecks that affected pharmaceutical companies after their involvement in logistics.

3.3 Sample Size

Field (2005) defines a sample as a group of individuals that is representative of the entire population and is used to generalize the entire study population. There are many ways to decide on the sample size of a study. The study was guided by the Krejcie & Morgan (1970) model as presented in Appendix III. Due to time constraints and financial issues the size of the sample that was used by the researcher is 48 as displayed in Table 3. 2.

Table 3.2: Sample Size

Target Respondents	Population Size	Sample Size
Senior Logistics Officers	25	20
Supply Chain Advisor	20	20
Logistics Manager	10	8
Total	**55**	**48**

Source: Primary Data 2023

The sample size chosen was guided by the desire to avoid unnecessary wasting of time and resources in contacting all target respondents by making the size of the sample representative of the entire population. In this understanding, the researcher decided for a sample representativeness of 80% for each category of respondents. The researcher thus saved time and money.

3.3.1 Sampling Methods

Sampling is a method of choosing a proportion, subgroup, or portion of a population that is representative of the entire population to add to a study (Holloway & Galvin, 2016). It is consistent with the definition (Smith, 2015) that sampling is a procedure in which a certain percentage of the population is selected to be investigated or analyzed and the conclusions are generalized and extended to the entire group from the subset drawn. Two common sampling methods are probability and non-probability sampling. Greenfield (2016) summarizes that probability sampling occurs when every object of analysis that is selected in the population has a fair chance of being incorporated into the sample of study. In contrast, sampling done using the non-probability method uses the researcher's own decision in choosing research subjects to be used in the study based on their knowledge of the subject under study (Holloway and Galvin, 2016). Probability sampling, Simple random sampling, non-probability sampling and purposive sampling methods were used as described below.

3.3.2 Simple Random Sampling

Senior logistics officers were selected by simple random sampling. Simple random sampling helps ensure that all subjects of analysis from the population have a fair chance of being chosen and be part of the sample (Punch and Oancea, 2014). To eliminate bias, the names of all senior logistics officers and supply chain advisors were listed separately on a Microsoft Excel 2007

sheet without following any order. The rand function in Microsoft Excel 2007 was used to generate random numbers between 0 and 1 against each name in separate lists for logistics officers and supply chain advisors. The researcher would then rank the two lists of names using random numbers in ascending order. The researcher then selected the topmost names in random number order until the required number of respondents was met.

It should be emphasized that sampling bias is eliminated by random selection of names and ensuring that the sample used in the study is a true representation of the population. As stated by Holloway and Galvin (2016), random sampling is used in this study as a selection procedure that would ensure that each subject in the sample has a fair chance of being chosen, thus eliminating bias in the selection by selecting respondents who would satisfy their own opinions or preconceived ideas. The generalizability of the findings was improved by removing bias from the sample of the study population.

3.3.3 Purposive Sampling

Purposive sampling method was chosen and used to select the pharmaceutical companies. Purposive sampling is a method of selecting research subjects based on the researcher's knowledge of the populations, the type of aims and study objectives, and its elements (Thomas et al, 2015). Another way of saying this is that the selection of respondents for a study is done non-randomly based on characteristics that the researcher recognizes and deems appropriate. In this research, respondents' basic understanding of the barriers to implementing effective logistics strategies in pharmaceutical companies in general will be considered important for participation in the study. Purposive sampling was appropriate for the target pharmaceutical companies as only a small number are to be included in the study to participate in the interviews.

3.4 Data Sources

This study utilised primary and secondary data.

3.4.1 Primary Data

As stated by Greenfield (2016), primary data refers to original information that has been gathered directly from the field by the researcher through surveys, interviews, and experiments to meet precise research objectives. Primary data for this study was collected using the survey method. It helped to gather data from several respondents to determine the barriers to implementing effective logistics strategies in pharmaceutical companies. Primary data is used

in a research study and data is collected using research instruments that meet the research objectives described in Chapter 1. Primary data is data that has not been tempered with by solving other problems outside the focus of this study. So, it is authentic and original data.

3.4.2 Secondary Data

Venkatesh, Brown, and Bala (2013) define secondary data as data collected from other studies or experiments conducted by other people to satisfy other objectives that may be different but applicable to the current focus of the study. Textbooks, journals, surveys, and government publications on barriers to implementing effective logistics strategies will be used as materials of secondary data for this study. Secondary data assists the researcher in understanding the issues related to the barriers to implementing effective logistics strategies in pharmaceutical companies by exploring the opinions of other authors. The secondary data supplemented the primary data and served as a basis for comparison with the findings of the study.

3.5 Research Instruments

This study used structured questionnaires and structured interviews to collect data as explained below.

3.5.1 Questionnaires

Questionnaires were the research instrument that was used to gather information from senior logistics officers, supply chain advisors and logistics managers (see Appendix 1). A questionnaire is an instrument of research that has a list of written questions that are used to collect information from respondents and provide answers to the research problem it is trying to solve (Smith, 2015). Questionnaire design, rationale, administration, and suitability for the study are detailed below.

3.5.2 Questionnaire Design

First, the questionnaires were structured. This was to ensure that the questions were asked in a precise and unchanging order. Such constancy and consistency greatly reduced the impact of contextual effects. Context effects refer to a method where previous questions influence responses to later questions in a study (Rubin and Babbie, 2016). The order in which the questions are arranged in the study is intended to facilitate answering the questions under comparatively similar conditions.

Second, the design of the questionnaire was based on research objectives. Each objective was converted into a sub-heading with specific questions that sought to gather data that would directly provide a solution to the stated objective. This development helps to ensure that the study remains focused on the objectives that were established in the opening chapter of the study. The questionnaire has five (5) sections including demographic data. Section A contains the demographics of the study respondents. Part B contains questions aimed at identifying logistics strategies in pharmaceutical companies. Section C contains questions that identify the effects of logistics strategies on organisational performance. Part D included questions to find out the challenges of implementing logistics strategies. Finally, Section E dealt with questions regarding recommendations on how to enhance organisational performance through logistics strategies in pharmaceutical companies.

Third, the questionnaire also contains closed and open questions. Closed questions have preset answers from which respondents choose the most appropriate answer. This allowed quantitative data to be collected so that descriptive statistics could be generated to determine trends in the data. Likewise, open-ended questions do not provide answer options, but offer respondents the opportunity to further elaborate on issues related to the barriers to implementing effective logistics strategies in pharmaceutical companies. This ensured the collection of qualitative data.

Fourth, a Likert scale with a five-point that ranged from strongly agree to strongly disagree was used for closed questions. The Likert scale shows the degree of agreement or disagreement by the respondents with the statements concerning the obstacles to the implementation of effective logistics strategies in pharmaceutical companies.

3.5.3 Questionnaire Administration

Questionnaires were sent by e-mail to respondents for separate administration. Self-administration was used with respondents who could be physically reached by the researcher. This helps to create a good and favorable relationship between the researcher and the respondents which helps to increase the response rate of the study. Distributed questionnaires were collected from a central location after two (2) business days. This was to give respondents enough time to answer the questions and refer to their internal records if necessary. Respondents are expected to be oblivious to logistics trends, hence the need for internal consultation. Questionnaires were also sent by e-mail to some of the respondents who could not be reached physically due to work responsibilities. The researcher requested their e-mail

addresses and sent electronic copies of the questionnaires, which were returned by e-mail after completion.

3.5.4 Rationale for Questionnaires

The appropriate questionnaires for this study used by the researcher were considered using various factors. First, questionnaires allowed the researcher to interact with senior logistics officers, supply chain advisors and logistics managers in a shorter period. Questionnaires are cost effective. Distribution of the questionnaires to the respondents was done personally and through email quickly by the researcher without taking too much time.

Second, questionnaires offer the flexibility to collect quantitative and qualitative data simultaneously. This is achieved by including both closed and open questions appropriately. This triangulation helps ensure that the weaknesses of the quantitative data are somehow balanced by the strengths of the qualitative data and vice versa.

Third, questionnaires are provided to the respondents to help ensure that they respond in the absence of the researcher to the questions. This minimizes the chances of bias in which respondents would be interested in impressing the researcher by providing positive answers. The researcher does this with the hope of giving the respondents privacy so that they can give truthful answers that are to the best of their knowledge and understanding.

3.6 Interviews

Data from local pharmaceutical companies were collected through in-depth interviews. According to Venkatesh et al, (2013) an interview is a one-on-one structured interview in which the interviewer asks the interviewee a question in which the former elicits information from the latter.

3.6.1 Interview Guide Design

The draft interview guide for academic work followed the study objectives (see Appendix II). The interview guide had four (4) sections namely Section A, B, C, and D. This was done to ensure that the objectives of the study were focused on and that the discussion did not deviate from them. The questions in Part A addressed the identification of logistics strategies used in pharmaceutical companies. Part B included questions that identify the effects of logistics strategies on organisational performance. Section C had questions to find out the challenges in implementing various logistics strategies. Section D will have questions on recommendations on how to enhance organisational performance through logistics strategies. The researcher

included bullet points to allow respondents to further explore details that respondents would not have provided in their responses.

The researcher contacted the target respondents by telephone to arrange meetings at times that were convenient for them. The researcher wanted to avoid interrupting the work activities of the respondents. Interviews lasted a maximum of 15 minutes according to the interview guide used by the researcher.

3.6.2 Rationale for the Interviews

Senior logisticians and supply chain advisors used in the study expressed their views on barriers to implementing effective logistics strategies through interviews. Interviews were used by the researcher as way of ensuring that he gets an opportunity to obtain further clarification of some matters from the respondents. Interviews are an important research tool because they allow the researcher to notice the body language, feelings, and reactions of respondents. According to Taylor et al, (2015), the use of non-verbal communication styles helps to understand the degree to which respondents agree or disagreement with the matter under investigation.

3.6.3 Pilot Testing

The questionnaire and interview guide were pilot tested before full administration, the researcher piloted the questionnaire on three (3) senior logistics officers and two (2) supply chain consultants and the interview guide on two (2) logistics managers. Pilot testing is a study that is done on a small scale in research in order to test, refine, and determine the suitability of a research instrument in collecting data and to ensure that it meets the objectives of the research without violating any rules of best research practice (Zikmund et.al 2013). The researcher explained the objectives of the study to the participants to ensure that they were met and achieved. The pilot exercise is intended to improve the quality of the questionnaire and interview guide. Participants were advised that they could make any improvements they felt were essential. Pilot testing helped to improve the order of the questions as the participating participants suggested that the design of the research instrument follows the research objective. Conducted pilot testing helped to remove duplicates in some collected questions of similar information.

3.7 Reliability and Validity

3.7.1 Reliability

In the opinion of Zikmund et al, (2013), the reliability of a study can be considered reliable if similar results can be found in other studies that follow the same research process and procedures. Reliability helps to ensure consistency from the instrument that is used in the measurement in the study (Sanoff, 2016). This study ensured reliability through the following steps: persistent monitoring of all questionnaires that were distributed to respondents. This helped ensure a higher response rate from respondents. The higher response rate ensured that the generalizability of the study results was improved. Credibility was also enhanced through the collection of credible and reliable secondary data from sources that verified its correctness, accuracy, and integrity before publication.

3.7.2 Validity

Validity with regards to research tells us how well the instrument or study among different participants accurately evaluates what it is intended to measure (Wilson, 2016). Validity tells us to what extent the data is factually correct and logical. Validity refers to the degree to which the results among study participants in a study can be generalized among the same individuals outside the study population (Sanoff, 2016). Validity in this study was guaranteed through the following steps: the researcher used 48 people to guarantee that the size of the sample was high enough so that 80% of the target population used in the study. The use of this sample size meant results obtained from this study were generalizable to the participants outside the study as they were adequately illustrative of the population. The validity of the academic work was strengthened by pilot testing, which helped to ensure that the questionnaire and interview guide were critically examined to verify the extent to which they would produce the expected results. The instruments used in the research were aligned with the research objectives to ensure that they measured or collected data related to the objectives the study planned to achieve.

3.8 Data Presentation and Analysis Procedures

Quantitative data was gathered using questions that are closed-ended from the questionnaires. The Statistical Package for the Social Sciences (SPSS) version 19 was utilised to analyze the questions. SPSS was used to generate statistics that are descriptive such as percentages and frequencies to illustrate or indicate patterns and trends developed from the data. The mean, mode, and median, known as measures of central tendency, were used to link the importance of factors influencing barriers to the implementation of effective logistics strategies. Standard

deviation and variance (measures of variance), where appropriate, were used in the study to help indicate how much the variables of interest deviated from identified means. A chi-square test of independence, a non-parametric inference test, will be conducted to determine whether any relationship exists between barriers to implementing successful logistics plans and SC effectiveness.

The collected data from the in-depth interviews were analyzed qualitatively. In this regard, a thematic content study was used. The researcher observed and recorded patterns in the data that aligned with Wilson's (2016) views that thematic analysis emphasizes analytical, investigative, and recording of data patterns (themes). The researcher first had to familiarize themself with the interview scripts, generate initial codes, look for emerging themes among the codes, evaluate the themes, and then describe and name the themes based on the collected issues, which were grouped together to come up with themes. Verbatim quotations were used to present some findings from the interview scripts.

Pie charts, bar graphs and tables will be used to display the information gathered. The tables in the study will be used by the researcher for results comparison. Graphs and pie charts were used to enhance the visual appeal of results. This was expected to increase results communication with the person reading.

3.9 Ethical Considerations

The following ethical considerations are likely to be observed by the researcher when conducting academic work.

3.9.1 Informed Consent

The study objectives, advantages, and disadvantages of participating in the study must be explained to the respondents by the researcher in accordance with best practice. This helps participants make an informed decision about whether they should participate in the study. The data gatherer emphasized to participants that it was voluntary to take part in the study and those who agreed to participate in the study were allowed to withdraw from it anytime they wished to. Respondents were also told by the researcher that they could choose whether to answer questions that were found in the questionnaire or interview guide.

3.9.2 Confidentiality and Privacy

Respondents were also formally informed by the researcher about how the information gathered, and results obtained in the study would be used. With regards to this subject, it should

be emphasized that the information gathered would be utilized for educational purposes and data analysis would be done in an aggregated format without reference to the individual participant. Participants were assured of identity protection by the researcher. This was in line with the assertion (Ritchie, 2013) that the personal information of the respondent in the study should be protected.

It was also stressed to participants that strict confidentiality would be maintained regarding their data and that result and that they would not be shared with third parties. The participants were informed by the researcher that the completed questionnaires and interview scripts would be locked in a safe and disposed of after the study was completed.

3.10 Chapter Summary

The research methodology used in conducting the study has been articulated well in this section. Data collection, interpretation, and analysis that guided this study was explained by the research philosophy and research design. This chapter contained provisions on the sample size, population and sampling methods that were utilised in conducting this study. Data sources, study instruments, and pilot testing were also conducted in this chapter. This chapter also addressed issues related to reliability and validity of the research. The data presentation and analysis techniques used in the study were also highlighted. Informed consent, confidentiality and privacy are covered in this chapter through ethical considerations. Presentation of results for this study will be done in the following chapter using information that was gathered from questionnaires that were distributed and interviews that were conducted.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction

The preceding chapter discussed the study procedures and techniques utilised in conducting the study. This section presents and analyzes data on customer/end-user requirements and expectations, supply chain challenges faced by pharmaceutical companies, measures that have been put in place to improve the supply chain of pharmaceutical companies, and recommendations for improving pharmaceutical company supply chains and pharmaceutical products. This is preceded by an analysis of the rate of response and demographic characteristics of the interviewees.

4.1 Response Rate

In this academic work, questionnaires totaling 48 were given to interviewees. After extensive monitoring of the questionnaires sent out, questionnaires totaling 44 were received back successfully. Since all questionnaires received were fully completed, a 91.7% rate of response was achieved by the study as displayed in Table 4.1.

Table 4.1: Response Rate

Population Cluster	**Number Sent**	**Number Received**	**Response Rate**
Senior logistics Officers	20	19	**95%**
Supply chain Advisors	20	18	**90%**
Logistics Advisors	8	7	**87.5%**
Total	**48**	**44**	**91.7%**

Source: Primary Data 2023

As the response rate achieved was above the 70% minimum threshold commonly recommended for studies (Albert, 2013), the findings satisfied the researcher in that the barriers to implementing effective logistics strategies could be generalized to pharmaceutical companies.

4.2 Demographic Characteristics

Gender, position in pharmaceutical companies, highest education, and experience working in pharmaceutical companies of the interviewees are included in this chapter. These personal characteristics were considered important because they had an impact on understanding the barriers to implementing effective logistics strategies.

4.2.1 Gender and Position in Pharmaceutical Companies

The results in Table 4.2 relate to the position of the interviewees and gender in Pharmaceutical Companies.

Table 4.2: Gender and Position Cross Tabulation

			Position				
			Senior Manager	Middle Manager	Supervisor	Non Manager	Total
gender	Male	Count	5	9	4	9	27
		% of Total	11.4%	20.5%	9.1%	20.5%	61.4%
	Female	Count	3	5	3	6	17
		% of Total	6.8%	11.4%	6.8%	13.6%	38.6%
Total		Count	8	14	7	15	44
		% of Total	18.2%	31.8%	15.9%	34.1%	100.0%

Source: Primary Data 2023

Results in Table 4.2 show that from the 44 interviewees, there were 61.4% male and 38.6% female. This study has shown that the targeted departments in the pharmaceutical companies had more males than females. Despite the notable increase in female participation in logistics activities, the findings demonstrate the need for Pharmaceutical Companies to continue to increase the gender representation. With regards to position, the results show that 18.2% were senior managers, 31.8% were middle managers, 15.9% were supervisors and 34.1% were non managers. This meant that respondents who were impacted by barriers to implementing effective logistics strategies at different levels were involved in the study. In other words, respondents in logistics formulation and implementation at Pharmaceutical Companies were included in the study.

4.2.2 Highest Level of Qualification and Work Experience

The results in Table 4.3 refer to the highest level of qualification and working experience which the study respondents had achieved at the period of conducting the research.

Table 4.3: Highest Level of Qualification and Work Experience

			Experience				
			Up to 5 years	6-10 years	11-15 years	Over 15 years	Total
Education	Secondary Education and below	Count	2	1	2	0	5
		% of Total	4.5%	2.3%	4.5%	.0%	11.4%
	Certificate / Diploma	Count	3	6	4	3	16
		% of Total	6.8%	13.6%	9.1%	6.8%	36.4%
	First Degree	Count	0	5	4	1	10
		% of Total	.0%	11.4%	9.1%	2.3%	22.7%
	Postgraduate Degree	Count	1	3	3	1	8
		% of Total	2.3%	6.8%	6.8%	2.3%	18.2%
	Other	Count	2	1	1	1	5
		% of Total	4.5%	2.3%	2.3%	2.3%	11.4%
Total		Count	8	16	14	6	44
		% of Total	18.2%	36.4%	31.8%	13.6%	100.0%

Source: Primary Data 2023

The conclusions in Table 4.3 show that 11.4% of the interviewees had attained secondary education or below, 36.4% had certificates or diplomas, 22.7% had first degrees, 18.2% had postgraduate degrees and the remaining 11.4% had other qualifications. This meant that the respondents had attained acceptable levels of education which would allow them to appreciate matters relating to the barriers to implementing effective logistics strategies in pharmaceutical companies in Zimbabwe. The results also show that 18.2% of the respondents had up to 5 years of experience, as high as 36.4% had an experience of between 6-10 years, 31.8% had experience of between 11-15 years and the remaining 13.6% had over 15 years of experience. This meant that the respondents had adequate experience which would allow them to understand the history relating to the barriers to implementing effective logistics strategies in pharmaceutical companies in Zimbabwe.

4.3 Barriers to implementing effective logistics strategies in pharmaceutical companies in Zimbabwe.

This section covers the various areas impacted by barriers to implementing effective logistics strategies in pharmaceutical companies in Zimbabwe. The study respondents in the study were requested to use the 5-point Likert scale to show the extent they agreed or disagreed. The areas impacted by barriers to implementing effective logistics strategies were procurement, inventory management, transportation, forecasting and quantification and information. Since strongly agreed was represented by 5 while strongly disagreed was represented by 1 in the input to SPSS, a mean rating above 3.000 was deemed to strongly indicate agreement while a mean below 3.000 indicated strong disagreement in relative terms. The standard deviation and mean rating of every area affected are as shown in Table 4.4.

Table 4.4: Descriptive Statistics of areas impacted by barriers to implementing effective logistics strategies.

Areas impacted by barriers to implementing effective logistics strategies	N	Mean	Standard Deviation
Transportation	44	4.849	1.292
Inventory Management	44	3.782	1.279
Forecasting and quantification	44	3.59	1.388

Procurement	44	2.457	1.008
Information	44	2.070	1.108

Source: Primary Data 2023

The findings indicate that there was a strong agreement among the respondents that pharmaceutical companies transportation was most impacted by barriers to effective logistics strategies implementation (mean = 4.849; standard deviation = 1.292). This meant that the Pharmaceutical Companies acquired their stocks from a variety of suppliers.

The results in Table 4.4 further show that the other areas impacted were inventory management (mean = 3.782; standard deviation = 1.279) as well as forecasting and quantification (mean= 3.59; standard deviation = 1.388). As suggested by George (2017), it was explained that the Pharmaceutical Companies had an IT function which provides service to all its units. The interviews also indicated that Pharmaceutical Companies were required to purchase some of its requirements from the local market in compliance with national development initiative such as the Indigenisation and Economic Empowerment Legislation (IEEL), Buy Zimbabwe Campaign (BZC) and the Statutory Instrument No.64 (SI64) which prohibited the importation of certain pharmaceutical products.

On the contrary, Table 4.4 results show that the areas less impacted were information (mean = 2.070; standard deviation = 1.108) and procurement (mean = 2.457; standard deviation = 1.008). It is possible that Pharmaceutical Companies did not extensively apply single sourcing given the need to limit overdependence on one supplier as well as the need to meet a diverse range of drug stocks. It could be difficult for a single supplier to meet such requirements at the right quality and quantities. The findings supported empirical evidence by Estampe et al (2013) who indicated that Rover experienced contractual problems with its only chassis supplier. The limited application of global sourcing could stem from the limited foreign currency resources in the country which would force the organisation to internally acquire its sourcing requirements. These results were in line with Chowa (2013)’s view that global sourcing initiatives are suitable logistics strategies for multinational companies which may also apply to pharmaceutical companies.

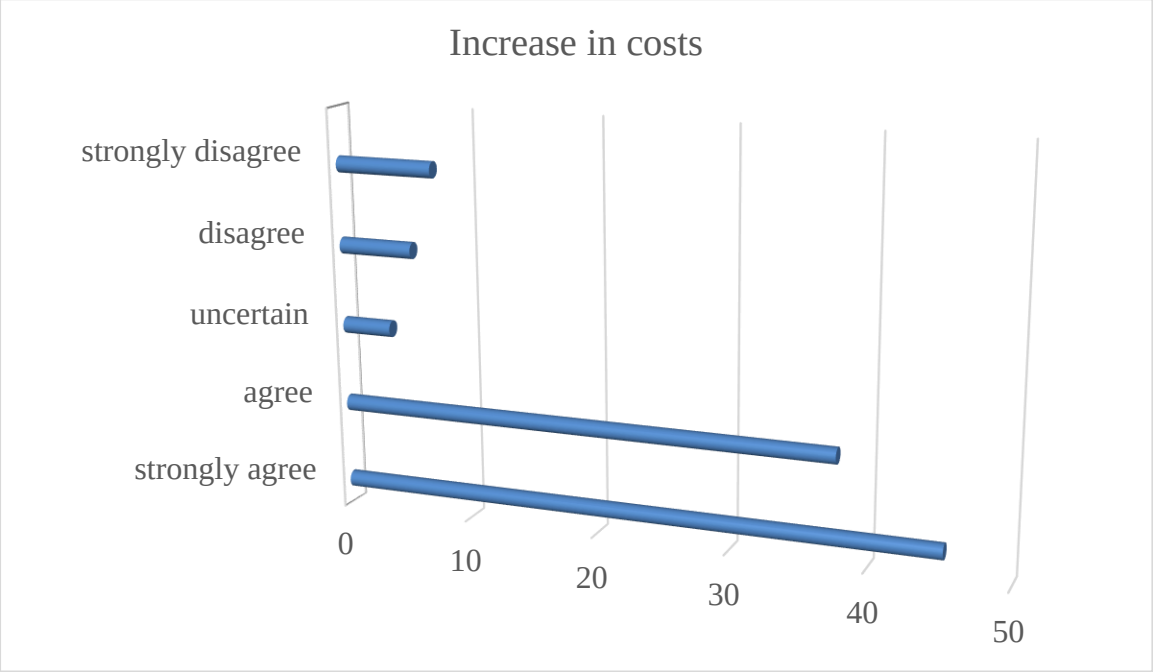
4.4 Factors that impact logistics strategies.

This section presents and analyses data on the factors that impact SC effectiveness in pharmaceutical companies. The level of agreement and disagreement among the study respondents was shown using the 5-point Likert scale with pre-identified effects.

4.4.1 Increase in Costs

The results in Figure 4.5 relate to the effect of how logistics strategies affect organisational performance through increase in costs of doing business.

Figure 4.0: Increase in Costs



Source: Primary Data 2023

These results indicate that as high as 45.3% of the study respondents strongly agreed, 37.7% agreed, those who were uncertain were only 3.8%, 5.7% disagreed and 7.5% strongly disagreed. This means that a cumulative 83% of the respondents agreed that the logistics strategies have implications on the costs of doing business. This was in line with the views of the interviewees who indicated that adopting logistics strategies such as inventory and return management in Zimbabwe might attract higher prices making it difficult for the logistics function to contain costs. The results were in support of the assertions made by Hallikas and Lintukangas (2016) that failure to experience economies of scale increases the average cost of goods and services.

4.4.2 Enhance Collaboration

Table 4.6 below shows results that relate to the thoughts of the study respondents concerning the effect that logistics strategies enhance collaboration.

Table 4.5 Enhance Collaboration

		Percent	Cumulative Percent
Valid	Strongly Disagree	11.3	11.3
	Disagree	7.5	18.8
	Uncertain	5.7	24.5
	Agree	32.1	56.6
	Strongly Agree	43.4	100.0

Source: Primary Data 2023

The above findings indicate that 43.4% of the study respondents strongly agreed, 32.1% agreed, uncertain were 5.7%, 7.5% disagreed and 11.3% strongly disagreed. The results therefore indicate that 75.5% of the respondents agreed that pharmaceutical companies could benefit from improved collaboration. This could probably be explained by the fact that pharmaceutical logistics involves complex and high value technologies which might necessitate the need for win-win collaborations between buyers and sellers to operationalise such processes and activities. These findings confirmed Hallikas and Lintukangas (2016)'s assertions that developed countries occasionally collaborate in medical spending to reduce the cost of acquiring pharmaceutical products.

4.4.3 Improvement in Information Technology

The respondents of the study were also requested to show to what extent they were in agreement or disagreement that the application of logistics strategies improves information technology systems within pharmaceutical companies. Table 4.6 below shows the results that were obtained.

Table 4.6 Improvement in Information Technology

		Percent	Cumulative Percent
Valid	Strongly Disagree	5.7	5.7
	Disagree	13.2	18.9
	Uncertain	3.8	22.6
	Agree	37.7	60.4
	Strongly Agree	39.6	100.0
	Total	100.0	

Source: Primary Data 2023

The above findings indicate that respondents of the study that strongly agree are 39.6%, 37.7% agreed, those that are uncertain are 3.8%, 13.2% disagreed and 5.7% strongly disagreed. A total of 77.3% of the respondents of the study agreed, the results suggested that the respondents of the study felt that there is need to make an investment in better logistics systems that would improve the information technology capabilities of the pharmaceutical companies. This could be accounted for by the possibility that the application of advanced logistics strategies could facilitate the computerisation of the logistics processes and inventory management techniques such as the Economic Order Quantity (EOQ), Just in Time (JIT), Material Requirement Planning (MRP) and the Enterprise Resource Planning (ERP). In addition, the interview results also showed that the pharmaceutical companies might be forced to adopt electronic systems to apply some logistics strategies such as global sourcing. Overall, the results supported the views of Eckerd (2016) that companies invest huge sums of money in information technology to improve their logistical and supply chain systems.

4.4.4 Increase in Lead Times and Frequent Stock Outs

Table 4.7 below shows results of the extent to which the respondents of the study agreed or disagreed that logistics strategies can affect organisational performance in Pharmaceutical Companies through increases in lead times and associated stock out circumstances.

Table 4.7 Increase in Lead Times and Frequent Stock Outs

		Percent	Cumulative Percent
Valid	Strongly Disagree	7.5	7.5
	Disagree	11.3	18.8
	Uncertain	5.7	24.5
	Agree	47.2	71.7
	Strongly Agree	28.3	100.0
	Total	100.0	

Source: Primary Data 2023

Respondents of the study that strongly agreed were 28.3%, as high as 47.2% agreed, 5.7% were uncertain, 11.3% disagreed and the remaining 7.5% strongly disagreed. This meant that a cumulative 75.5% of the respondents agreed that increases in lead times and frequent stock out circumstances affected organisational performance at the Pharmaceutical Companies. The general explanations from the interviewees were that frequent stock outs lead to high purchasing costs associated due to emergency purchases and damage the goodwill and reputation of the pharmaceutical companies as they fail to deliver their constitutional mandate.

4.4.5 Other Effects of Logistics Strategies on Organizational Performance

The study respondents were also asked to indicate other effects which they thought logistics strategies had on organizational performance. The major emerging impact was on the efficient and sustainable utilization of pharmaceutical resources wherein the respondent R41 and R43 felt that all pharmaceutical companies should responsibly allocate funds which they receive from the central government or from their internal projects. Respondent R23 also noted that the logistics function has the responsibility to ensure surpluses from the resources allocated are used well by exercising best logistics practices.

4.5 Challenges of implementing logistics Strategies

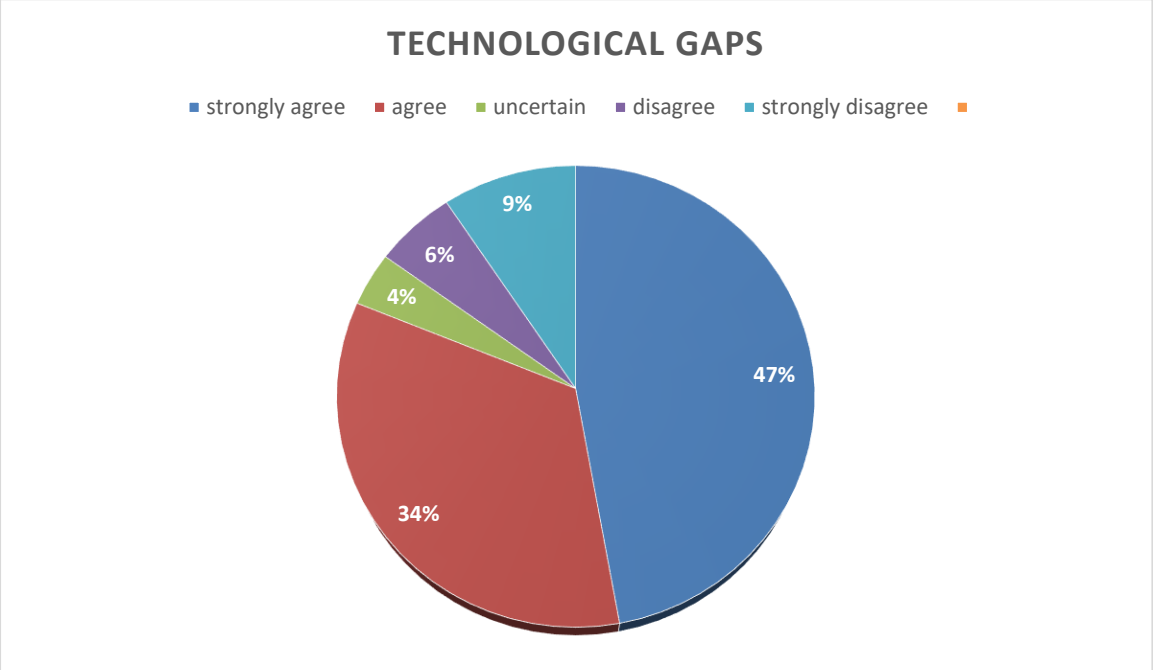
Challenges of implementing logistics strategies were also established in this study with the aim of improving organisational performance of pharmaceutical companies. The specific challenges covered were technological gaps, Customer service, Government and

environmental Regulation, Transportation cost control and Lack of skilled manpower. Respondents of the study were asked to air out their views to show to what level they agreed or disagreement with these challenges.

4.5.1 Technological Gaps

The results in Figure 4.1 illustrate the level of agreement or disagreement with the existence of technological gaps as challenges in the application of logistics strategies to improve organizational performance in pharmaceutical companies.

Figure 4.1: Technological Gaps



Source: Primary data 2023

Respondents of the study that strongly agreed were 47% and 34% were in agreement therefore giving a total of 81% respondents of the study who were in agreement. On the contrary, 9% strongly disagreed and 6% disagreed giving a cumulative 15%. The remaining 4% were uncertain. There is unanimous agreement (81%) among the respondents on the existence of technological challenges in pharmaceutical companies. This was further substantiated by interviewees who indicated that logistics functions often fail to meet the technological requirements of the evolving pharmaceutical landscape. These results supported Gunasekaran et al (2005)'s views that pharmaceutical logistics in developing countries is negatively affected by technological gaps. An explanation of the Technological gaps in the majority of the pharmaceutical companies in Zimbabwe can be made clear by the fact that they are unable to

meet the technologically relevant and advanced equipment which is required in modern day pharmaceutical companies.

4.5.2 Customer service

Table 4.8 illustrates how the respondents agreed or disagreed concerning the challenge that there is a general lack of good customer service among stakeholders in the pharmaceutical supply chain.

Table 4.8: Customer Service

		Percent	Cumulative Percent
Valid	Strongly Disagree	44.7	44.7
	Disagree	25.5	70.2
	Uncertain	12.8	83.0
	Agree	6.4	89.4
	Strongly Agree	10.6	100.0
	Total	100.0	

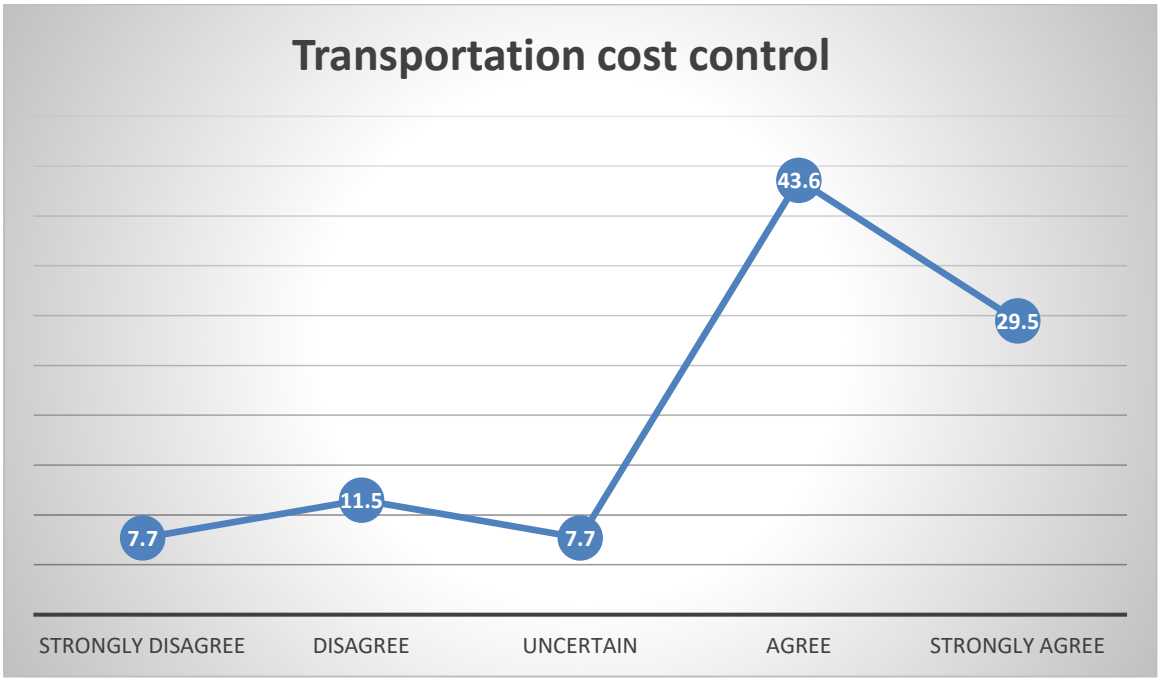
Source: Primary Data 2023

As indicated by the results above 44.7% of the respondents strongly disagreed, 25.5% disagreed, 12.8% were uncertain, only 6.4% agreed and 10.6% strongly agreed. Given that as high as 70.2% of the respondents were in disagreement, the results seemed to suggest that customer service was not a challenge for the logistics processes in pharmaceutical companies. It could be possible that the pharmaceutical companies had managed to make its staff and supply chain actors appreciate the importance of customer service that should be observed when dealing with logistics issues. The interviewees also cited that the public in Zimbabwe is increasingly appreciating the role which the pharmaceutical companies play in ensuring customer service. These findings contradicted Maestrini et al (2017)’s assertions that pharmaceutical logistics has often received negative remarks in public opinion mainly due to the lack of customer service among non-pharmaceutical personnel in most countries.

4.5.3 Transportation cost control

Figure 4.2 illustrates findings related to the failure to meet Transportation cost control in pharmaceutical companies.

Figure 4.2: Transportation cost control



Source: Primary Data 2023

Results above clearly show 29.5% of the respondents of the study strongly agreed and as high as 43.6% agreed therefore giving a cumulative total of 73.1%. In addition, those that were uncertain 7.7%, 11.5% were in disagreement and the remaining balance of 7.7% strongly disagreed. Considering that the bulk (73.1%) of the respondents of the study agreed, these results suggested that failure to control transport costs was indeed a challenge. This could arise from the domestic logistics strategy in which the production capacities of the local manufacturers fail to meet the quantity requirements of pharmaceutical products resulting in pharmaceutical companies engaging global suppliers. These results generally confirmed the findings made by Arnaboldi *et al* (2015) that unreliable suppliers result in difficulties in achieving optimum quantities of stock that consider the carrying and ordering costs.

4.5.4 Government and environmental Regulation

Results of the extent to which respondents of the study agreed or disagreed that pharmaceutical companies face significant government and environmental regulation in their logistics supply chain are shown in Table 4.9.

Table 4.9: Government and environmental Regulation

		Percent	**Cumulative Percent**
Valid	Strongly Disagree	9.4	9.4
	Disagree	15.1	24.6

	Uncertain	5.7	30.3
	Agree	30.2	60.5
	Strongly agree	39.6	100.0
	Total	100.0	

Source: Primary Data 2023

There's an indication in the above table that 39.6% of the respondents of the study strongly agreed, 30.2% were in agreement, 5.7% respondents felt uncertain, 15.1% were in disagreement and the remaining 9.4% strongly disagreed. The findings show that the bulk (69.7%) of the respondents of the study agreed that pharmaceutical companies faced significant government .and environmental regulation. It came out from the respondents of the study that pharmaceutical companies faced several government and environmental regulation including registration of drugs and import permits on the back of struggling local suppliers. It was further noted that global sourcing had also been negatively affected by transportation in the country as well as the impact of sanctions on supplies from countries hostile to Zimbabwe.

4.5.5 Lack of skilled manpower

Table 4.10: Lack of skilled manpower

		Percent	Cumulative Percent
Valid	Strongly Disagree	18.8	18.8
	Disagree	17.0	35.8
	Uncertain	5.7	41.5
	Agree	26.4	67.9
	Strongly Agree	32.1	100.0
	Total	100.0	

Source: Primary Data 2023

The above table shows that 32.1% respondents of the study strongly agreed and those that agreed were 26.4%. This translated into a 58.5% total of study respondents that were in agreement. On the contrary, respondents that strongly disagreed were 18.8% and those that were in disagreement were 17% giving a total of 35.8% of respondents that were in

disagreement. The results also show that only 5.7% of the respondents were uncertain. Considering that the bulk (58.5%) of the study respondents agreed, these results suggest a general feeling among the respondents that the supply chain actors failed to engage skilled manpower for their pharmaceutical logistics supply chain. The interviews indicated that most of the pharmaceutical companies could not meet the quality, dependability, cost, service, and delivery standards set by the regulatory body. These results therefore were in support of Zinyama et al (2015) who suggested that competitive quality is a key consideration that buyers make in selecting the best supplier of goods, services and works.

4.5.6 Other Challenges of Implementing logistics Strategies.

With regards to other challenges, it came out that pharmaceutical companies at times experience financial challenges in line with the foreign currency shortages in the country. This leads to a failure to update its logistics systems as most of the equipment and stocks would require being imported. A sizeable number of the respondents also indicated that pharmaceutical companies experience shortages of technical staff in logistics in circumstances in which detailed technical specifications are required. As a result, external consultancy is occasionally sought to provide the services.

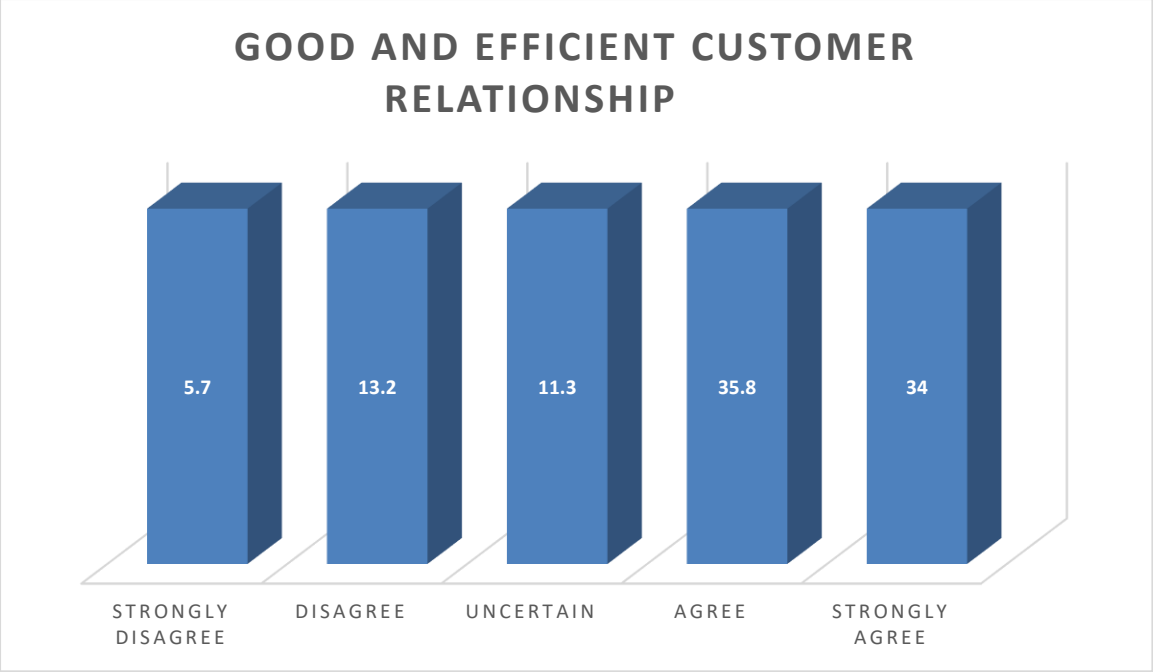
4.6 Ways of Improving Organizational Performance through logistics Strategies

This section looks at the ways which can be adopted to improve organisational performance through various logistics strategies. Respondents in the study were requested to show their level at which they agreed or disagreed using pre-established strategies.

4.6.1 Good and efficient customer relationships

The findings in Figure 4.3 relate to the extent of agreement or disagreement that respondents in the study have that building good and efficient customer relationships between buyers and suppliers could positively influence the logistics system and improve organisational performance.

Figure 4.3: Good and efficient customer relationships



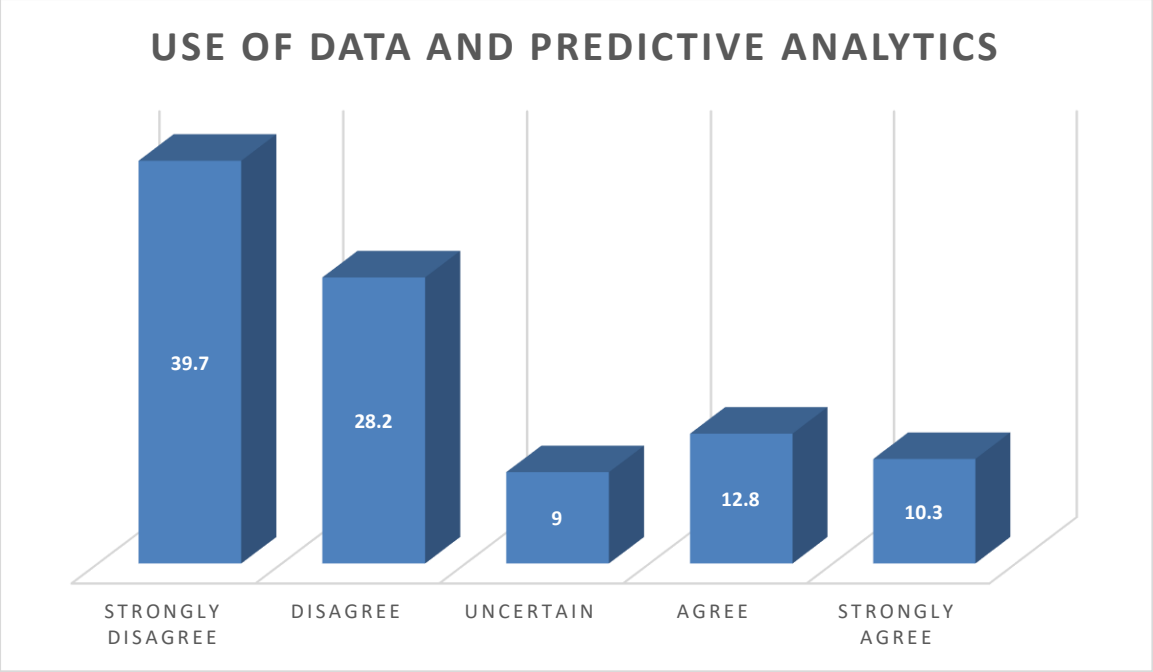
Source: Primary data 2023

From the above results it is clearly indicated that study respondents that strongly agreed were 34%, 35.8% agreed, uncertain were 11.3%, 13.2% were in disagreement and the remaining 5.7% strongly disagreed. This meant that the sum of those respondents that agreed was 69.8%, that good and efficient customer relationships between buyers and suppliers could improve logistics processes and organisational performance. The possible explanation could be that the organisations would be able to meet the costs to be incurred in the purchase of high value stocks or would be able to combine knowledge and industry expertise. The results were therefore in line with the assertions made by CIPS (2010) that cooperative or collaborative relationships benefit the supply chain actors through shared services and synergies.

4.6.2 Use of data and predictive analytics

Figure 4.4 illustrates the extent to which respondents agree or disagree with regards to the use of data and predictive analytics as a way of improving their supply capabilities.

Figure 4.4: Use of data and predictive analytics



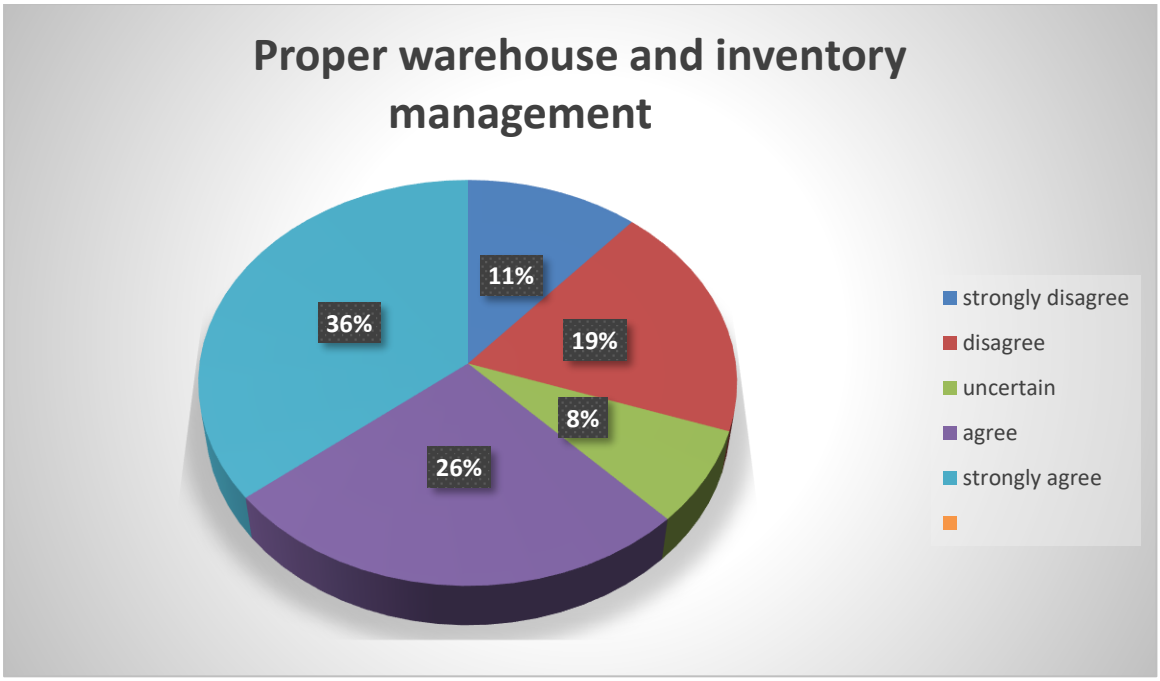
Source: Primary Data 2023

It is clearly indicated from the above diagram that 39.7% respondents of the study strongly disagreed and an additional 28.2% disagreed. This worked out to a cumulative 67.9% of study respondents that were in disagreement. On the other hand, 10.3% strongly agreed, 12.8% agreed giving a sum of 23.1%. The rest of the 9% were uncertain. The general disagreement among the respondents could be explained by the fact that big data sets are hard to come by and even if they have sufficient data, they may fail to consider the variables that might influence the logistics strategies. A thorough understanding of predictive analytics could assist in forecasting and inventory management.

4.6.3 Proper warehouse and inventory management

The study respondents were also asked to indicate whether they agreed or disagreed that the use of proper warehouse and inventory management would improve logistics systems and in turn improve organisational performance. The views of the respondents were as indicated in Figure 4.5.

Figure 4.5: Proper warehouse and inventory management



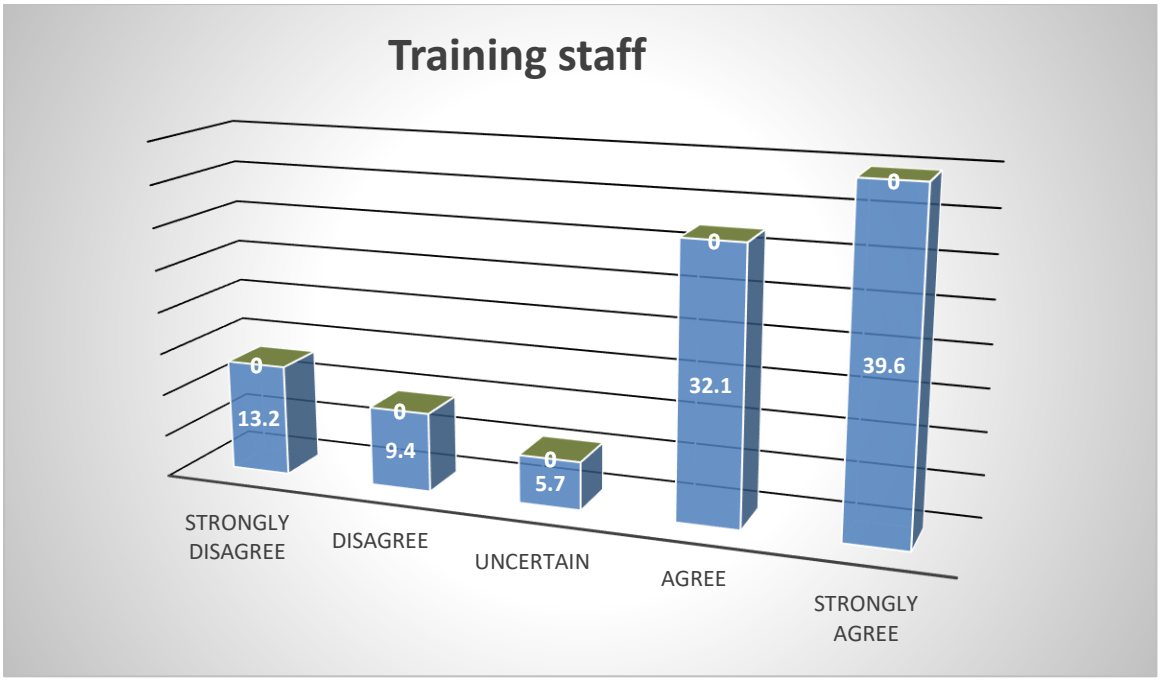
Source: Primary Data 2023

The results indicate 35.8% respondents of the study strongly agreed, 26.4% agreed, 7.5% were uncertain, 18.9% disagreed and 11.3% strongly disagreed. This meant a cumulative 62.2% of the respondents were in agreement that proper warehouse and inventory management could improve the logistics processes and organisational performance.

4.6.4 Training staff

The results in Figure 4.6 refer to the level at which the respondents were in agreement or disagreement that the provision of training and development programmes on logistics could improve organisational performance.

Figure 4.6: Training of staff



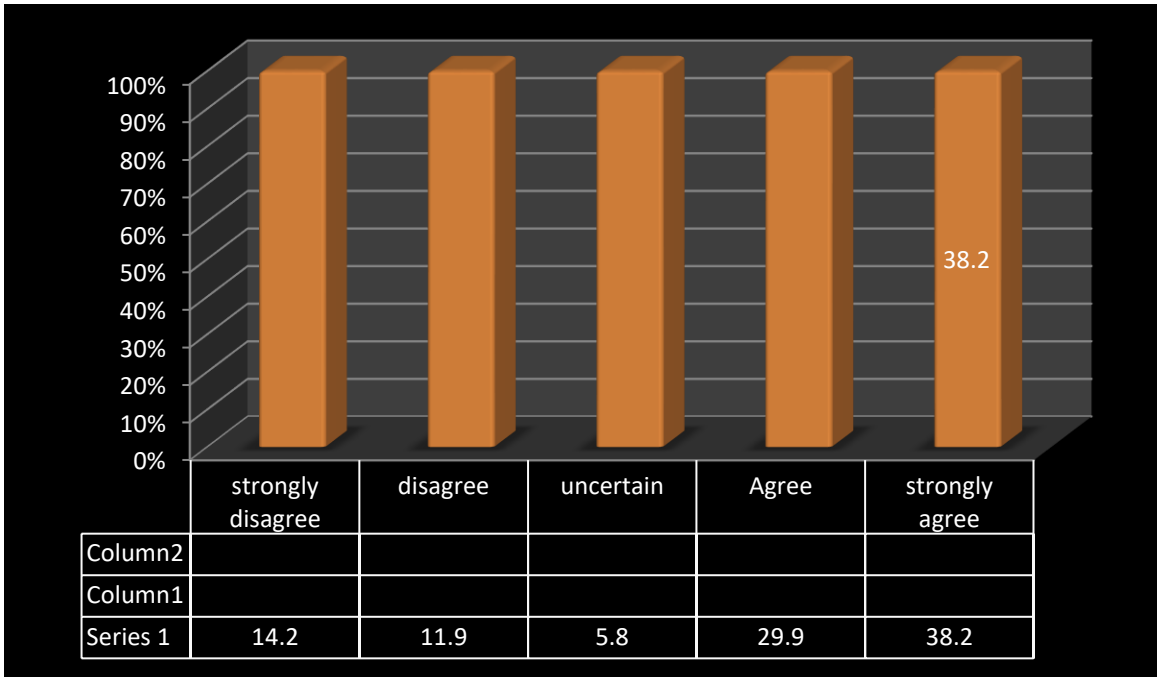
Source: Primary Data 2023

Figure 4.6 shows results that 39.6% respondents from the study strongly agreed, 32.1% agreed, 5.7% were uncertain, 9.4% disagreed and 13.2% strongly disagreed. Given that as high as 71.7% of the respondents were in agreement, this suggested that the general feeling among the respondents was training, and development programmes would be effective in enhancing logistics strategies in pharmaceutical companies. The explanation could be that supply chain actors would improve their customer care capabilities, knowledge of the logistics process, quality standards and general management of businesses. The results supported the assertions made by Gobbi and Hsuan (2015) that training, and development programmes ensure that buyers and sellers keep pace with changing logistics strategies for better organisational performance.

4.6.5 Adoption of Technology

Results from Figure 4.7 refer to the extent to which the study respondents agreed or disagreed that the adoption of technology in logistics could improve organisational performance.

Figure 4.7: Adoption of Technology



Source: Primary Data 2023

The findings in Figure 4.7 indicate 38.2% of respondents from the study strongly agreed, 29.9% agreed, 5.8% were uncertain, 11.9% disagreed and 14.2% strongly disagreed. Given that as high as 68.1% of the respondents were in agreement, this suggested that there was a common feeling among the study respondents that adoption of technology would be effective in enhancing logistics strategies in pharmaceutical companies. The explanation could be that the role of technology in logistics is to speed up business processes and prevent bottlenecks through faster data flow, a comprehensive distribution system and improved collaboration with e-commerce, results in increased revenue. Technology also allows pharmaceutical companies to meet their customers' needs and maintain customer loyalty.

4.7 Interview Results

This section covers the major themes which emerged from the interviews.

4.7.1 Logistics Strategies Used in Pharmaceutical Companies

With regards to the logistics strategies used by pharmaceutical companies, interviewees indicated that inventory and return management, efficient transportation through digitisation, warehouse management, dependable suppliers and operating expenses control were mainly used. Interviewees indicated that pharmaceutical companies would stand to benefit from inventory and return management because keeping maximum inventory even through fluctuating demand periods creates a supply chain that is cost-effective which in turn improves

prices and quality of the products and services. It is essential to track all returns so that refurbishment and reprocessing of the product is efficient. Supply chain discrepancies can be recognised and corrected when using a management system that is efficient.

Domestic sourcing was adopted in line with the need to comply with local legislation and national development strategies. It was also indicated that pharmaceutical companies adopted efficient transportation through digitisation in order to: (i) find the most secure, direct, and perfect route for quicker delivery (ii) find cost effective, enhanced packaging which doesn't add more weight and/or volume. This helps to build better customer relationships, add reliability across the whole supply chain and minimise the need for excess inventory.

4.7.2 Effects of logistics Strategies on Organisational Performance

It was generally agreed that adopting logistics strategies such as adoption of technology in Zimbabwe will increase the costs of doing business making it difficult for the logistics function to contain costs. Pharmaceutical companies were also able to get into collaborations and partnerships with suppliers and customers. Most of the interviewees also said that pharmaceutical companies might be forced to adopt electronic systems to apply some logistics strategies such as global sourcing. This would lead to improved information technology.

4.7.3 Challenges of implementing various logistics Strategies

The major challenge which was cited by the interviewees was the technological differences or gaps when compared to counterparts or suppliers in the region and beyond. It was indicated by a sizeable number of the respondents that most of the local suppliers are not able to supply the right machinery and equipment that matches the changing technologies. The local suppliers were generally found to be unreliable and thus led to supply shocks, stock outs and longer lead times.

4.7.4 Recommendations to Enhance Organisational Performance through logistics Strategies.

The major themes which emerged from the interview results were that pharmaceutical companies should enter collaborative relationships between buyer and supplier so that the organisation is guaranteed a good supply of its requirements. The interviewees also called for more training and development so that the staff members would be more knowledgeable about their duties and responsibilities in logistics.

4.8 Chapter Summary

This chapter displayed and examined the data on logistics strategies used by pharmaceutical companies, effects of logistics strategies on organisational performance, challenges of implementing logistics strategies in pharmaceutical companies and possible strategies by which organisational performance can be enhanced using various logistics strategies in pharmaceutical companies. The following chapter will cover the recommendations and conclusions of the research.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

Results of this study will be summarised in this chapter. Conclusions which will be based on key results will follow. Recommendations for the study will also be made in this chapter. Finally, areas of further study on the barriers to implementing effective logistics strategies in pharmaceutical companies in Zimbabwe are suggested.

5.2 Summary of Findings

This research examined the barriers to implementing effective logistics strategies in pharmaceutical companies in Zimbabwe. The study objectives were to identify requirements and expectations of customers/end users of pharmaceutical products, to identify supply chain challenges encountered by pharmaceutical companies, to find out measures that have been put in place to improve the movement and distribution of pharmaceuticals by pharmaceutical companies and to come up with recommendations for improving the supply chain of pharmaceutical products. Related literature was reviewed in line with these objectives. The research design that was adopted by the study is the descriptive survey. Questionnaires that were structured and in-depth interviews were also used. The data analysis revealed the following key findings.

5.2.1 Logistics Strategies Used in Pharmaceutical Companies

With regards to the logistics strategies used by pharmaceutical companies, the study found out that Inventory and return management, efficient transportation through digitisation and dependable suppliers were the main logistics strategies adopted. These logistics strategies were supported by higher mean ratings of 4.849, 3.782 and 3.590 respectively which all confirmed stronger levels of agreement among the study respondents. The Pharmaceutical Companies needed to improve technology adoption along the supply as well as comply with national development initiatives such IEEL, BZC and SI64.

5.2.2 Effects of logistics Strategies on Organisational Performance

Logistics strategies have effects on organisational performance; the study established that strategies in logistics have implications on costs of doing business if economies of scale are not realized. This was indicated by a total of 83% of the respondents. A cumulative 75.5% of

the respondents felt that ineffective logistics strategies lead to increased lead times and associated frequent stock out circumstances which dent the ability of the Pharmaceutical Companies to meet its constitutional mandate as well as damage the goodwill and reputation of the Pharmaceutical Companies. It was also revealed that the adoption of logistics strategies positively enhances collaboration with other countries or suppliers as well as enhances the information technology needs of Pharmaceutical Companies. Respondents of the study that were in agreement were 75.5% and 77.3% respectively. Collaboration would be necessitated by the need to procure high value logistics technologies while some logistics strategies would require an overhaul of the existing information technology systems.

5.2.3 Challenges of Pharmaceutical Companies logistics Strategies

Concerning the challenges, the study noted that Pharmaceutical Companies experienced technological gaps as local suppliers failed to supply the technologically relevant and advanced equipment. This was supported by a total of 68.1% of the respondents. It further came out that most of the suppliers did not meet the quantity, quality, dependability, cost, service, and delivery standards set by Pharmaceutical Companies. It was also agreed that Pharmaceutical Companies were exposed to logistics risks arising from possible supply shocks from unreliable local suppliers and foreign currency shortages needed for critical imports.

5.2.4 Possible Ways of improving logistics Strategies for Better Organisational Performance

Pertaining to possible ways of improving logistics strategies for better organisational performance, the study found out that Use of data and predictive analytics, Proper warehouse and inventory management and Adoption of technology would be effective in enhancing logistics strategies in pharmaceutical companies. These strategies received support from a total of 23.1%, 62.2% and 68.1% of the respondents who were in agreement that they are workable solutions for better supply chain processes and associated organisational performance. Based on these key findings, the following conclusions were drawn.

5.3 Conclusions

The key findings above brought about the conclusions below.

5.3.1 Logistics Strategies Used by Pharmaceutical Companies

The study concluded that Pharmaceutical Companies used Inventory and returns management, Warehouse management and Dependable suppliers as logistics strategies. This was driven by the need to promote collaborative relationships and the need to support national economic development.

5.3.2 Effects of logistics Strategies on Organisational Performance

It was concluded in the study that logistics strategies affected organisational performance through impacting the cost of doing business, increased lead times and associated frequent stock out circumstances. The study further noted that the organisation could benefit from collaborations and improvements in information technology in line with potential adoption of sophisticated logistics strategies.

5.3.3 Challenges in implementing logistics strategies.

The study concluded that pharmaceutical companies faced technological gaps as local suppliers failed to supply the technologically relevant and advanced equipment needed. The study concluded that pharmaceutical companies did not meet the quantity, quality, dependability, cost, service, and delivery standards set by the government. The pharmaceutical companies also experienced supply shocks on the importation of critical supplies due to the scarcity of foreign currencies.

5.3.4 Strategies to Improve Logistics Strategies and Organisational Performance

The study concluded that building Good and efficient customer relationship with supply chain stakeholders, Proper warehouse and inventory management and Adoption of technology on supply chain would improve organisational in pharmaceutical companies. This would enhance professionalism and knowledge of logistics strategies and how they affect organisational performance.

5.4 Recommendations

The recommendations that came from the above conclusions are as follows.

5.4.1 Proper planning and setting goals of logistics Strategies.

The study recommended that pharmaceutical companies should plan the whole logistics procedure. This could be achieved through reviewing its logistics strategies on a case-by-case

basis. The pharmaceutical companies would therefore be able to balance the need to support national economic objectives as well as ensuring that suppliers have adequate capacity to supply its critical needs.

5.4.2 Seek Win-Win Strategic Partnerships

Given the material impact of logistics strategies on organisational performance, the study recommended that pharmaceutical companies should seek win-win partnerships that are strategic with players that are key to its supply chain. This could include collaborating with stakeholders who can bring in opportunities for improved information technology, better technological advances in pharmaceutical procurement, and supply assurance so that the risk of increased lead times and stock outs circumstances would be minimised. Such relationships could be established with countries which are friendly to Zimbabwe including those in the East such as China and India.

5.4.3 Review Supplier Registration Requirements

The study recommended that pharmaceutical companies review their supplier registration requirements. This could give the organisation an opportunity to specify its new quantity, quality, dependability, cost, service, and delivery standards with suppliers, including the locals that they should abide by. This could reduce incidences in which the requirements of the pharmaceutical companies are not met in the context of these specifications.

5.4.4 Increase Training and Development

The study recommended that pharmaceutical companies increase their training and development programmes on logistics. Such training could be done on-the-job or by sending staff members to colleges and universities. The training programmes could cover the pharmaceutical regulation, cold chain, handling of drugs, professionalism, and knowledge of logistics strategies to enhance organisational performance.

5.5 Areas for Further Study

This academic work was restricted to pharmaceutical companies in and around the Harare region and employed a sample size of 48. This was due to time and resource constraints. For the purpose of enhancing the generalisability of the outcomes of the study, it was recommended that a further study with a bigger sample size and covering other areas outside Harare be conducted in the future.

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APPENDICES

Appendix 1: Questionnaire

My name is Faith Lydia Manhanga. I am studying towards the attainment of a Masters in Purchasing and Supply Chain Management. As part of the requirements of the degree, I am conducting a study titled **"An investigation of the barriers to implementing effective logistics strategies in pharmaceutical companies in Zimbabwe."**

I am kindly requesting that you assist me in my studies by completing this questionnaire. Kindly note that information obtained from this questionnaire will be confidential and the results will be used in an aggregate form without reference to individual answers. Participation in this study is voluntary and you may decide to exit at any point. I greatly appreciate the time you will take in responding to the questions. If there are some important aspects or areas of

interest that you think have been left out, kindly add your comments at the end of the questionnaire.

SECTION A: DEMOGRAPHIC INFORMATION

1. Gender

Male ☐

Female ☐

2. Position in the Organisation

Senior Manager ☐

Middle Manager ☐

Supervisor ☐

Non-Manager ☐

3. Highest Level of Qualification

Secondary Education and below ☐

Certificate / Diploma ☐

First Degree ☐

Post Graduate Degree ☐

Other (Please specify) ……...

4. Work Experience in Procurement/ Finance/Company

Up to 5 years ☐

6-10 years ☐

11-15 years ☐

Over 15 years ☐

SECTION B: LOGISTICS STRATEGIES USED IN PHARMACEUTICAL COMPANIES.

5. Drawing from your experience, do you agree or disagree that pharmaceutical companies use various logistics strategies in the supply chain? *[1–Strongly disagree, 2–Disagree, 3 – Uncertain, 4 – Agree, 5 - Strongly Agree].*

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐

6. Show your level of agreement or disagreement with respect to the following statements relating to how pharmaceutical companies use the following logistics strategies. *[1–Strongly disagree, 2–Disagree, 3 –Uncertain, 4 – Agree, 5 - Strongly Agree]*

Logistics Strategies	**1**	**2**	**3**	**4**	**5**
Inventory and return management					
Efficient transportation through digitisation					
Warehouse management					
Dependable suppliers					
Operating expenses control					

SECTION C: EFFECTS OF LOGISTICS STRATEGIES ON ORGANISATIONAL PERFORMANCE.

7. Show your level of agreement or disagreement with the extent to which the following logistics strategies affect organisational performance. *[1–Strongly disagree, 2–Disagree, 3 –Uncertain, 4 – Agree, 5 - Strongly Agree]*

Effects of logistics strategies on organisational performance	**1**	**2**	**3**	**4**	**5**
Increase in costs					
Enhance collaboration					
Improvement in information technology					
Frequent stock outs					
Increase in lead times					

8.What supply chain factors do you think affect organisation performance of pharmaceutical companies?

……

……

……

SECTION D: CHALLENGES OF IMPLEMENTING VARIOUS LOGISTICS STRATEGIES

9. Show your level of agreement or disagreement with the extent to which the following challenges affect pharmaceutical companies' organisational performance. *[1–Strongly disagree, 2–Disagree, 3 –Uncertain, 4 – Agree, 5 - Strongly Agree]*

Challenges of implementing various logistics strategies	**1**	**2**	**3**	**4**	**5**
Technological gaps					
Customer service					

Transportation cost control					
Government and environmental Regulation					
Lack of skilled manpower					

10. What do you think are the other challenges of implementing various logistics strategies in pharmaceutical companies?

……

……

……

SECTION E: RECOMMENDATIONS ON HOW TO ENHANCE ORGANISATIONAL PERFORMANCE THROUGH LOGISTICS STRATEGIES.

12. Show your level of agreement or disagreement with respect to the suitability of the following ways of improving organisational performance through various sourcing strategies. *[1–Strongly disagree, 2–Disagree, 3 –Uncertain, 4 – Agree, 5 - Strongly Agree]*.

Ways of improving organisational performance through logistics strategies	**1**	**2**	**3**	**4**	**5**
Good and efficient customer relationships					
Use of data and predictive analytics					
Proper warehouse and inventory management					
Adoption of technology					
Training of staff					

End

Thank you for taking part in the study.

Appendix 2

Interview guide

The following questions will be used in the interview sessions. The bullet points will be used as checklists to ensure that the required areas are covered and to prompt the respondents.

Interview Questions
SECTION A: LOGISTICS STRATEGIES USED IN PHARMACEUTICAL COMPANIES. • Please tell me about your thoughts on the various logistics strategies used by pharmaceutical companies.

- Comment on the applicability of the logistics strategies used. Are they in line with best practice requirement and are they being conducted in line with the Procurement Regulatory Act of Zimbabwe.
- Do you agree or disagree that pharmaceutical companies use all the possible logistics strategies to their advantages?
- Why do you think so?

SECTION B: EFFECTS OF LOGISTICS STRATEGIES ON ORGANISATIONAL PERFORMANCE.

- What do you think are the effects of the various logistics strategies on organisational performance? Please explain.
- How do you think logistics strategies affect costs, collaboration, lead times, information technology and inventory management?

SECTION C: CHALLENGES OF IMPLEMENTING VARIOUS LOGISTICS STRATEGIES

- What do you think are the challenges of implementing the various logistics strategies on organisational performance? Please explain.
- Please explain the challenges on security, technological gaps and on meeting large orders.

SECTION D: RECOMMENDATIONS ON HOW TO ENHANCE ORGANISATIONAL PERFORMANCE THROUGH LOGISTICS SOURCING STRATEGIES.

- In your opinion, how do you think Pharmaceutical companies can successfully implement logistics strategies to enhance organisational performance?
- Can you explain how you think the following can improve the operations of pharmaceutical companies' logistics strategies.
- Good and efficient customer relationship.
- Use of data and predictive analytics.

- Proper warehouse and inventory management.
- Adoption of technology.
- Training of staff.

Appendix 3
Krejcie and Morgan Model (1970) Sample Size Determination

N	***S***	***N***	***S***	***N***	***S***
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327

60	**52**	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note: N is population size, S is sample size.