Department of Accounting and Finance

The effect of inventory management practices on service delivery of Infinity Advanced Technology solutions P.L.C

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MAY, 2021

ADDIS ABABA, ETHIOPIA

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A Thesis Submitted to

Department Accounting and finance

Presented in Partial Fulfilment of Requirements for the Degree of Master of MBA

St. Marry University

Addis Ababa, Ethiopia

May, 2021

DECLARATION

I, Fikirte Kassahun, hereby declare that this thesis entitled, the effect of inventory management practices on service delivery of Infinity Advanced Technology solutions P.L.C is my original work and that sources of materials used in this thesis have been duly acknowledged. I seriously declare that this thesis is not submitted to any other institution anywhere for an academic degree, diploma, or certificate.

Name: Fikirte Kassahun

Signature……

Date.....

Letter of Certification

This is to certify that Fikirte Kassahunhas carried out his thesis on the topic entitled:the effect of inventory management practices on service delivery of Infinity Advanced Technology solutions P.L.C.This work is original in nature and suitable for the award of Masters Business Administration (MBA).

Mohammed Seid (assistant prof.) Signature---------- Date._____

St. Marry University

School of Graduate Studies

I, the undersigned, declare that the thesis prepared by **Fikirte Kassahun**entitled:The effect of inventory management practices on service delivery of Infinity Advanced Technology solutions P.L.C. submitted in partial fulfilment of the requirements for the degree of master of business administration compiles with the regulations of the university and meets accepted standards with respect to originality and quality.

Signed by the Examining Committee:

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External Examiner _____Signature_____Date_____

Internal Examiner_____Signature_____Date_____

Advisor _____Signature_____Date_____

Abstract

The main objective of the study is to examine the effect inventory management practice on service delivery Infinity Advanced Technology solutions private medical equipment supplier in Bole sub-city. To achieve this objective the primary data collected through structured questionnaire from 140 respondents based on census method was used. To do so both descriptive and inferential statistics was used. The estimation result of the model using SPSS 2020 revealed that education level has insignificant effect on effectiveness of service delivery. While inventory management practice, transport distribution and distribution management practice, warehouse practice on medical equipment supply chain, years of experience of employees have statistically positive significant effect on service delivery. On the other hand, procurement of medical equipment has statistically significant effect. It is recommended that improve the management system , appropriate personnel involved in quantified & procurement process ,it need the government to review the public procurement policy for minimize bureaucratic processes in the procurement system, adequate budget should be available because of to prevent stock out of health commodities. In other hand engagement with, NGOs, PFSA and other supplies to work strongly to avail all health commodities required for health commodities and to minimize if possible to avoid stock out.

Key words:*inventory management; service delivery*

Acknowledgment

First of all I would like to thank Almighty God and his mother's Saint Marry forgiving me strength and commitment for the compilation of this thesis and in whole of my life.

I would like to extend my heartfelt gratitude to my adviser **Mohammed Seid**(Ass.Prof) for his unreserved support at each step of this study.

I would also like to extend my special thanks to Infinity Advanced Technology solutions P.L.C. and Staffs for their generous assistance and support.Finally I would like to thank my family and friends who support me in doing this study.

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Acronyms

EOQ Economic Order Quantity model

MOH Ministry of Health

PFSA Pharmaceuticals Fund and Supply Agency

SOP Standard Operating Procedure

USAID United States Agency for International Development

VMI Vendor Managed Inventory

WHO World Health Organization

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the Study

Inventory management focuses on the techniques that will be used to ensure stocks or raw materials and semi-finished goods are kept in a manner that gives the maximum possible service quality with achievable lower cost (Lysons, 2000). Thus effective management of stocks is an important aspect for the effectiveness of an organization and the quality of the service it delivers. World Health Organization (WHO, 2016) indicated that efficient management of laboratory and medical commodities is vital for suppliers to have up-to-date inventory count at all times and it can deliver good customer service with accurate information which in turn improves the images of the organization. Moreover, according to USAID (2016) robust inventory management system allows managers to receive real time information on inventory. This will assist management to accurately made informed decisions, anywhere, anytime and save time and cost used for labour and thus working on inventory management properly. A reliable and consistent supply of these commodities to health facilities at all levels of the health system will determine not only the performance of the organization but also the success of health programme as a whole in the nation (Raja & Mohammad, 2005).

Infinity Advanced Technology solutions P.L.c is one of private medical equipment supplier in Ethiopia located in Bole sub-city and it is established in 2006 G.C. It strives to address the growing demand for quality medical equipment, supplies and services. With a large and undeserved market, the continued growths of the business opportunities are very positive. While the countries current micro-economic environment presents challenges for business development and growth, positive changes are anticipated. This study intends to examine the effect of inventory management on service delivery of Infinity Advanced Technology solutions P.L.c medical equipment supplier.

1.2. Statement of the Problem

To insure regular supply of medical equipment's when it is required inventory is the first solution. As a result firms have to give greater attention for the inventory management

practice. For instance, Sanghvi (1988) pointed out that the reliability and quality of service delivery are key, because the performance of the firm highly dependence on the service it delivers without higher cost. However, the critical issue that most of the medical equipment supplier firms is the demand for medical equipment is not perfectly predicted, which creates the imbalance between demand and supply (supply will be greater than demand). This imbalance creates causes inventory investment will increase and if it takes long time to sell the stored stocks will be worn out and the loss will be higher. However, ineffective management of inventories are the main problems for some organizations, which results wastage and loss of materials. Medical equipment suppliers are also an organization those should manage their inventory effectively (Chopra and Meindl, 2007).

Maintaining appropriate inventory level is crucial to ensure sustainable supply of medical equipment. Too much inventory is difficult because it consumes large physical space, creates financial burden and it results damage and loss. On the other hand too small inventory level will cause the loss of customer loyalty and it negatively affects business operation (Shiau, 2017). The main factors affecting medical equipment supplier inventory management include balancing demand with the supply and balancing costs with the right amount of inventory to sustain quality and timely patient care (Gebicki et. al, 2014). Hence, inventory management affects the supply chain management, as it ensures cost containment, supply chain effectiveness, supply chain efficiencies and customer satisfaction (Toba et.al. 2008).

According to Fariza et.al. (2015) all types of wastage like overstocking and expiry need to be managed efficiently. This wastage reduces the quantity of medical equipment's available to buyers and therefore hinders the quality of health care delivery. On the other hand under stocking, overstocking and expiry of medical equipment's reflect problems within the medical equipment's supply activities which include selection, quantification, procurement, storage, distribution and use. The literature review of most of the studies conducted on medical equipment's inventory management practices and challenges was on cost minimization and reduction of wastages one specific area and only on a single facility only.

Infinity Advanced Technology solutions P.L.C is a service rendering institution and one that keeps stock to facilitate medical equipment supplies. To meet the customer's expectation of medical equipment supply, the institution can think of how to control inventory of medical supplies at the right time and at the right quantity in order to avoid expiry of drugs and misuse of the supplies. In Infinity Advanced Technology solutions P.L.C it is observed that

there are grievances by customers that the drugs are not available to them from the stores services. The focus of this research is to examine and understand inventory management practices of medical equipment's and challenges in Infinity Advanced Technology solutions P.L.C since frequent stock out of drugs, expires of drugs, laboratory reagents, lack of safety stocks of medical equipment are observed as major problems in the Infinity Advanced Technology solutions P.L.C medical equipment inventory management. It has been observed that there are stock depletions and shortages of pharmaceuticals at the service delivery point, and clients complain about the service.

Moreover, there are many studies conducted on inventory management of medical equipment's and other business. For instance, Esther (2015), Liul (2019), Otundo & Bichanga (2015), Oballah (2015), Okiria (2017), Mbiriri & Moronge (2018), Kiiza (2018), and Barasa et.al., (2018) conducted a study on inventory management practice and its effect on service delivery. However, the practice of inventory management is different from institution to institution and the factor affecting inventory management practice and in turn on service delivery of the organization is different. Thus to the best of my knowledge there is no studies conducted on inventory management practice's on service delivery in Infinity Advanced Technology solutions P.L.C. therefore this study will try to examine the effect of inventory management on service delivery.

1.3. Objectives of the study

1.3.1. General Objectives

The main objective of the study is to examine the effect inventory management practice on service delivery Infinity Advanced Technology solutions PLC.

1.3.2. Specific objectives

In order to achieve this general objective, the researcher specified the following specific objectives:

- To assessservice delivery commonly practiced by Infinity Advanced Technology solutions PLC.
- To examine the effect of inventory management practice on effectiveness of service delivery in Infinity Advanced Technology solutions PLC.
- To analyse the effect of procurement practice on effectiveness of service delivery in Infinity Advanced Technology solutions PLC.

- To see the effect of Warehouse Storage Practices on effectiveness of service delivery in Infinity Advanced Technology solutions PLC.
- To determine the effect of transportation practice on the service delivery of Infinity Advanced Technology solutions private medical equipment supplier.

1.4. Research questions

To the end this study will try to answer the following research questions

- What are inventory management techniques commonly practiced by Infinity Advanced Technology solutions private medical equipment supplier?
- What is the effect of inventory management practice on effectiveness of service delivery in Infinity Advanced Technology solutions PLC?
- What is the effect of procurement management practice on effectiveness of service delivery in Infinity Advanced Technology solutions PLC?
- What is the effect of Warehouse Storage Practices on effectiveness of service delivery in Infinity Advanced Technology solutions PLC?
- What is the effect of transportation practice on the service delivery of Infinity Advanced Technology solutions private medical equipment supplier?

1.5. Hypothesis of the Study

The following hypothesis were formulated and tested

H1: inventory management practice has positive significant effect on service delivery

H2: Transportation and distribution management practice and effectiveness of service delivery have positive relationship**.**

H3: procurement management practice has negative significant effect on effectiveness of service delivery.

H4: Warehouse practice on medical equipment supply chain management and effectiveness of servicer delivery has positive significant

1.6. Significance of the Study

The findings of this study will benefit deferent stockholders. Firstly the result and the policy recommendations that will be drawn from this study will benefit Infinity Advanced

Technology solutions private medical equipment supplier to revise the inventory management practice and to boost up the satisfaction of customers. Second it will be used as a reference for future studies on the subject area. Finally, it will be important for other domestic and international business firms operated in medical supply.

1.7. Scope of the Study

Considering all medical equipment suppliers at the national level is difficult from the perspective of data collection and cost of conducting a study. Due to this this study limited only on Infinity Advanced Technology solutions private medical equipment supplier located in Bole sub-city.

1.8. Organizations of the Study

This research paper will be organized into five chapters. In the first chapter all introductory parts of the study like background of the study, problem statement, research question, objective of the study, significant of the study as well as scope of the study are included. The second chapter of the study comprises the theoretical framework, which is a compilation of other author‘s journals and articles, literature about the medical equipment inventory management practices and challenges. This section also includes a review of various empirical studies that have been made on this topic. The methodology part of the proposal is discussed in chapter three and represents the processes to mapping out the study area, research design, target population, method of data collection and research instruments, methods of data analysis and ethical consideration. The fourth chapter will include findings on medical equipment inventory management practices and challenges at Infinity Advanced Technology solutions private medical equipment supplier. The last chapter will cover summary of findings, conclusions and recommendations.

CHAPTER TWO

REVIEW OF RELATED THEORETICAL AND EMPIRICAL LITERATURES

2.1. Definition of Terms

Medical equipment: Medical devices requiring calibration, maintenance, repair, user training, and decommissioning – activities usually managed by clinical engineers. Medical equipment is used for the specific purposes of diagnosis and treatment of disease or rehabilitation following disease or injury; it can be used either alone or in combination with any accessory, consumable, or other piece of medical equipment. Medical equipment excludes implantable, disposable or single-use medical devices World Health Organization (WHO, 2011).

Inventory: Inventory is defined as a stock or store of goods (Stock and Lambert, 2001). Arnorld et al. (2008) defined inventory as the materials and supplies that a business or institution carries either for sale or to provide inputs or supplies to the production process.

2.2. Purposes of inventory/Reasons for Holding Inventory

Inventory is a major use of capital and for this reason; efficient inventory management is to increase organizational profitability, to predict the impact of organizational policies on inventory levels, and to minimize the total cost of logistics activities. An organization incurs costs every time an item is handled. Since handling generally adds no value to a product or service, it should be kept to a lowest minimum. By carefully analysing material flows, inventory management can save an organization significant amount of money (Chopra & Meindl, 2003). They explained that inventory exists in an organizational operation because of the mismatch between supply and demand.

Therefore, inventory's role is to increase the amount of demand that can be satisfied by having the product or service ready and available when the customer wants it. Another important role inventory plays are to reduce cost by exploiting economies of scale that may exist during production and distribution, but managers should use actions that lower the amount of inventory needed without increasing cost. Arnorld et al., (2008) suggests that since inventory plays a significant role in a supply chain's ability to support a firm's competitive strategy and that the firm's competitive strategy requires very high level of responsiveness; a company can achieve this responsiveness by locating large amounts of inventory close to the

customer. Another very important role that inventory plays in an organization is to avoid stock-out costs (the costs of being out of inventory). This is very important to all organizations, especially in the healthcare delivery where delay by a few seconds can cost a life.

2.3. Inventory Costs

Inventory represents an investment in the organization whether as a result of deliberate policy or not. Inventory cost is important for three major reasons. First, inventory cost represents a significant component of total logistics cost in many companies. Second, the inventory levels that a firm maintains at points in its logistic system affect the level of service the firm can provide to its customers. Third, cost trade-off decisions in logistics frequently depend upon and ultimately affect inventory carrying cost (Coyle, et al., 2003). The categories of cost associated with inventory are: costs of holding stock (carrying costs), costs of obtaining stock (ordering cost), stock out costs, and the cost of the stock itself.

2.3.1. Costs of Holding Stock

Costs of Holding Stock, also known as carrying cost, is the variable cost of keeping inventory on hand, and is a combination of the costs associated with opportunity costs, interest on capital invested on the stock, storage charges (rent, lighting etc.), taxes, equipment maintenance and running cost, insurance and security, shrinkage, and other variables. It represents one of the highest costs of logistics.

2.3.2. Costs of Obtaining Stock

This cost is the expense of placing an order for additional inventory and does not include the cost or expense of the product itself. It includes the clerical and administrative costs associated with the purchasing, accounting and goods received departments; transport cost; and set up and tooling costs associated with each production run where goods are manufactured internally.

2.3.3. Stock-out Costs

It is the cost of not having product available when a customer demands or need it. When an item is unavailable for sale, a customer may accept a back order for future availability of the needed product, or perhaps purchase (or substitute) a competitor’s product, directly taking profit from the firm experiencing the stock out. Stock out costs include lost contribution

through the lost sale caused by the stock out, loss of future sales because customers may go elsewhere, cost of production stoppages caused by stock out of work-in-progress and raw materials, and extra costs associated with urgent, often small quantity, replenishment orders.

2.3.4. Cost of the Stock

Cost of the stock also called purchasing cost is the cost of the purchased item itself. These costs are buying in prices or the direct cost of production. These costs are needed to be considered when discount is available for bulk purchases, and when savings in production cost are possible with longer batch runs.

2.4. Inventory Management

Inventory management is the set of policies and controls that monitor levels of inventory and determine what levels should be maintained, when stock should be replenished, and how large orders should be. Inventory management involves ordering, receiving, storing, issuing, and reordering limited items. Firms keep a supply of inventory to maintain independence of operations, meet variation in product demand, and allow flexibility in production scheduling, provide a safeguard for variation in raw material delivery time, take advantage of economic purchase order size and anticipation of price changes. In making any decision that affects inventory size, one must consider inventory holding costs which includes the costs for storage facilities, handling, insurance, pilferage, breakage, obsolescence, depreciation, taxes, and the opportunity cost of capital; Setup (or production change) costs; Ordering costs and Shortage costs (Odinga, 2007).

An inventory management system aims to assist in determining when and how much stock to order or issue. Orders that are placed timely allow drugs to be available at the right time. Successful inventory management is based on good record keeping. Paper-based record keeping is found in most drug supply systems, where stock cards or bin cards are used for that purpose. Maintaining enough stock to avoid shortages, to confront fluctuation and to avoid oversupply also constitutes the aim of successful inventory management. Poor inventory management can be inferred from inaccurate stock records, inadequate and unsystematic monitoring of medical stock, and indefinite procedures in terms of frequency and quantity. These incidences can be traced to inadequate know-how of inventory management and its actual management (MSH, 2012).

Inventory control is one of the elements underpinning inventory management; a failure to monitor stock levels regularly could have fatal consequences; disruption of or delay in a course of treatment 16 which may worsen a patient's condition and lead to death if a lifesaving medicine is out of stock. The lack of a standardized inventory control system with procedures for monitoring and managing stock levels of drugs is a challenge to emerging logistic systems; as is the case in Lesotho where stock levels were not monitored, resulting in stock out and over-stocking of certain medicines (Clark & Barraclough, 2010). Inventory control deals with the physical control of product quantities in the store to ensure a balance on hand. It helps to decide what, when and how much to keep in the store to avoid shortages and pilferages and to minimize ineffective stock. Matching the stock on hand with stock keeping records by physically counting the number of each type of product in the store at a given time is required for functioning inventory management. In inventory management, records serve as the basis of the information needed in ordering new stocks of medicines and other supplies, and provide an audit trail. Records are crucial in inventory management as they help in ensuring balanced levels of stock and are the basis for decision-making.

2.5. Inventory Management Practice

Inventory is a very expensive asset that can be replaced with information which is a less expensive asset but to do this, the information has to be accurate, timely, reliable and consistent. When this happens, you carry fewer inventories, reduce cost and get products to customers faster (David, 1996). This therefore implies that inventory management is very important if a company wants to achieve a balance between efficiency and responsiveness. David, (1996) explains the following objectives of inventory management: maximizing customer service, maximizing the efficiency of purchasing and production, maximizing inventory investment and maximizing profit.

Inventory management is a critical management issue for most companies – large companies, medium-sized companies, and small companies. Effective inventory flow management in supply chains is one of the key factors for success. The challenge in managing inventory is to balance the supply of inventory with demand. A company would ideally want to have enough inventories to satisfy the demands of its customers- no lost sales due to inventory stock-outs. On the other hand, the company does not want to have too much inventory staying on hand because of the cost of carrying inventory. Enough but not too much is the ultimate objective (Coyle, Bardi, and Langley, 2003). Inventory plays a significant role in the growth and

survival of an organization in the sense that ineffective and inefficient management of inventory will mean that the organization loses customers and sales will decline. Prudent management of inventory reduces depreciation, pilferage, and wastages while ensuring availability of the materials as at when required (Ogbadu, 2009). Inventory management is critical to an organization's success in today's competitive and dynamic market.

This entails a reduction in the cost of holding stocks by maintaining just enough inventories, in the right place and the right time and cost to make the right amount of needed products. High levels of inventory held in stock affect adversely the procurement performance out of the capital being held which affects cash flow leading to reduced efficiency, effectiveness and distorted functionality (Koin, Cheruiyot , and Mwangangi , 2014).In order to achieve the objectives of minimizing stock related costs, firms should maintain adequate levels of stock in order to enable smooth business operations. A number of practices have therefore been advanced to handle these costs. According to Agus and Noor (2006), the inventory management techniques that are universally adopted by firms include Economic Order Quantity (EOQ) model, ABC model, Vendor Managed Inventory (VMI) and Just-In-Time model, Economic Order Quantity model, Bar-coding, Just-In-Time model, ABC model, and Vendor Managed Inventory (VMI) and Simulation.

2.6. Empirical Literature

Esther (2015) examined the effect of inventory management practices on healthcare delivery using St. Martin's Catholic Hospital, Agroyesum, Amansi-West. A sample of 60 staff and 30 patients was selected for the study. Questionnaires were used as the main instrument of data collection. The study revealed that the hospital ensures agreements with supplier for short cycle deliveries (items which do not take long to deliver), ensures accurate prediction of supplier delivery dates and operate Materials Requirements Planning system (MRP). The study also revealed that the hospital ensures Strategic Supplier Partnerships as an Inventory management practice and strictly uses Information Technology in its inventory management practices. The patients were satisfied with the hospital's reliability of healthcare service (24 hour service and full complement of medical staff), completeness of healthcare service, empathy of healthcare staff and affordability of healthcare service and physical appearance of healthcare service. However, among the challenges the hospital faced with inventory management was poor storage of drugs leading to insufficient inventories, bureaucratic

process in procurement, and loss of drugs through inventory shrinkages, conflict of interest, weak management system and insufficient funds for procurement.

Liul (2019) assessed the effect of inventory management practice on logistics performance in the case of Ethiopian Defence Force Logistics Main Department. This study concerned to assess the inventory management and its effect on logistics management that may be enables the only military organization in the country to improve the quality service rendering to its end users since its mission is very sensitive. The study was employed both descriptive and explanatory research designs to conduct this research. It contained a qualitative and quantities component that enables the researcher to assess the study easily. The study encompasses the main root of the organization's inventory management areas of departments (purchasing, warehouse & finance. The sampling technique of the study was stratified sampling technique. The target population was 150 employees of Ethiopian Defence Force Logistics Department. The sample taken was 109 employees which was 73% of the total population and selected proportionally from each stratum. 4 department heads and 1 head of logistics main department were selected for interview and the remaining 104 members for questionnaire. According to the objectives of the study, the key findings of the study revealed that there is a gap on purchasing department in relation to applying competitive based purchasing practice, lack of information sharing between purchasing and warehouse departments, lack of computerized inventory management system, lack of proper inventory handling and disposal system and lack of on job and of job training programs in relation to inventory management practice. These gaps may highly affect the logistics performance in Ethiopian Defence Force Logistics Main Department in relation to customer satisfaction and delivery performance.

Otundo & Bichanga (2015)evaluateed the effects of inventory management practices on the operational performance of counties with particular interest of operations in Kisii County, Kenya. The specific objectives included establishing the effects of demand forecasting practice, inventory categorization practice; and Vendor managed inventory (VMI) practice on the operational performance of Kisii County, Kenya. The study established that supply dependability affect operational performance to a moderate extent 44.7%, effects of inventory categorization in terms of inventory for customer service is rated as the most influential on operational performance and free flow of order fulfilment of supplies, reduced inventories and timely replenishment of inventory to user departments influenced operational performance.

Oballah (2015)investigated the effect of inventory management practices on organizational performance in public health institutions in Kenya. The specific objectives were to establish: the effect of inventory shrinkage, inventory investment, inventory turnover, and inventory records accuracy on organizational performance of Kenyatta National hospital: A descriptive case study design was used. Statistical analysis was carried out using SPSS. The study revealed that inventory investment and inventory records accuracy have a positive influence on organizational performance while inventory shrinkage have a negative effect on organizational performance of Kenyatta National hospital thus this study recommends that the hospital should ensure that losses resulting to inventory shrinkage related to medicines are reduced. This can be done by ensuring that inventory records are accurately kept. The hospital need to manage its inventory investment by ensuring that the right amount of stock is kept at all times.

Okiria (2017) assessed the relationship between the Inventory management practices and the effectiveness of the downward supply chain of essential medicines in the selected 6 public hospitals in Uganda. A cross sectional descriptive and analytical survey was done with both qualitative and quantitative data collected. Two hospitals were regional referral and the four were general hospitals by level of care. Overall the study found a significant relationship between the level of inventory practices in the hospitals and the effectiveness of the downward supply chain.

Mbiriri, E. & Moronge M. (2018) examined the influence of inventory management systems on the service delivery in the public hospitals in Nairobi City County, Kenya. The study used 80 respondents who were involved in the inventory management activities in the public hospitals in Nairobi City County. The study used both descriptive and inferential methods of analysis. The study revealed that there is a positive relationship between service delivery in public hospitals and vender managed inventory systems. It is justified by a correlation coefficient of 0.788. This implied that these variables were very significant therefore needed to be considered in any effort to boost service delivery in the public hospitals in the study area. The study therefore identified the variables as critical factors of inventory management systems to enhance service delivery in the public hospitals in the study area.

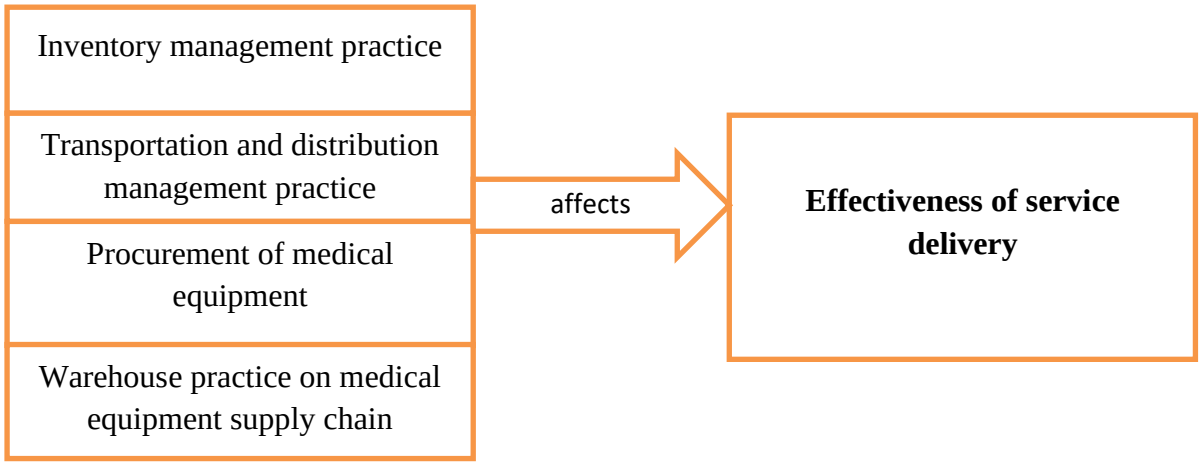
Kiiza (2018) examined the impact of inventory management on service delivery in public health facilities. The objectives of the study were to examine the inventory management techniques, to assess the ways through which inventory management influences service, and

to establish the challenges faced in implementing inventory management techniques employed at Kidera health Centre III. The methodology involved in this study is cross sectional research designs which employed the use of both quantitative and qualitative techniques. The population of study involved a cross section of stores personnel, procurement officers, human resource managers, accountants as well as a wide range of mid-level workers in Kidera health Centre III. Both purposive sampling and simple random sampling techniques were employed to attain responses from the employees in the organization that constituted of 50 respondents. The findings revealed that the challenges faced by Kidera health Centre as far as inventory management is concerned include the high maintenance costs as well as theft and pilferage. The organization has also got limited personnel with the required competence in managing MRP software which limits the applicability of the inventory management systems.

Barasa et.al., (2018) identified the influence of inventory management practices on availability of medicines. Descriptive cross sectional research design was used. They take nine sub-country hospitals were sampled and census method was used for four staffs for each sub-country: the sub county pharmacists, medical superintendents, procurement officers and health administrative officers (36 respondents). In addition, the head of procurement department in the county, the chief officer for health and sanitation and the county pharmacist were sampled, making a total of 39 respondents. Semi structured questionnaires; in-depth interview guides and a checklist were data collection tools. Analysis of data was done using descriptive statistics while Chi square was used as appropriate. The study revealed that the main inventory management challenges identified were lack of a county central store, lack of reliable inventory management system, inadequate pharmaceutical personnel and lack of up to date inventory management guidelines and SOPs. These were noted to have a negative influence on availability of medicines. A majority reported irregular ordering frequencies for medicines (78.1%). Kenya Medical Supplies Authority was said to be the main supplier of medicines by 93.8% of respondents as compared to local suppliers. Proximity to the health facility was a major factor considered in supplier selection and was ranked as important by 46.9% and as extremely important by 25% of all respondents.

2.7. Conceptual Framework

Bradley (2008) defines conceptual framework as a visual or written product that explain either graphically or in a narrative, the key factors and the presumed relationship among them. It is therefore a model used in research to outline possible courses of action or to present a preferred approach to an idea or thought. A conceptual framework is very important in any research study being undertaken. It shows the relationship between the dependent variables and the independent variable. The independent variables are inventory management practice,transportation and distribution management practice, procurement of medical equipment, and warehouse practice on medical equipment supply chain management top management support. The dependent variable is effectivenessof service delivery.



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CHAPTER THREE

METHODOLOGY OF THE STUDY

3.1. INTRODUCTION

In this chapter the research approach and design, the research population and sample, the nature and source of data collected and instrument used for the research. In addition, description of the tests employed to establish reliability and validity of the collected data for further analysis and ethical issues are discussed.

3.2. Research Approach

In this study pragmatic (mixed) research approach, which takes both qualitative and quantitative approach was discussed. Berg and Howard (2012) characterise qualitative research as meanings, a concept, a definition, metaphors, symbols and a description of things. This definition clearly show that qualitative research contains all necessary instruments that can evoke recall which aids problem-solving. Qualitative data instruments such as observation, open-ended questions, in-depth interview, and field notes are used to collect data from participants in their natural settings. Hence, qualitative research approach provides abundant data about real life people and situations (De Vaus, 2014). Secondly, the system through which data are retrieved in qualitative research approach is regarded as being unique. The reliance on the collection of non-numerical primary data such as words and pictures by the researcher who serves as an instrument himself makes qualitative research well-suited for providing factual and descriptive information (Johnson and Christensen, 2012). The emergent of theory from data allows the researcher to construct and reconstruct theories where necessary, based on the data he/she generates, instead of testing data generated elsewhere by other researchers.

In addition to qualitative approach, quantitative approach was also used. The first advantage of this research approach is the use of statistical data as a tool for saving time and resources. (Bryman, 2001) argue that quantitative research approach is the research that places emphasis on numbers and figures in the collection and analysis of data. Imperatively, quantitative research approach can be seen as being scientific in nature. The use of statistical data for the research descriptions and analysis reduces the time and effort which the researcher would have invested in describing the result. Data can be calculated and conducted by a computer

through the use of a statistical package. Secondly, the use of scientific methods for data collection and analysis make generalization possible with this type of approach. However, replicability is another benefit derivable from the use of this research approach. Since the research approach basically relies on hypotheses testing, the researcher need not to do intelligent guesswork, rather he would follow clear guidelines and objectives (Lichtman, 2013). As a result in this study qualitative data was collected by direct observation and face to face interview. And quantitative data will be collected by using structured questionnaire.

3.3. Research Design

To identify any causal links between inventory management and service delivery of the organization cross sectional data collected from primary sources were analysed by both descriptive and inferential statistics will be employed. This is because descriptive method is used to collect detailed description of existing phenomenon with the intent of employing data to justify current conditions and whether and whenever possible to draw conclusion from the facts that the researcher could discovered. The empirical study was used to support the descriptive statistics by statistical evidence.

3.4. Source, types of data, and data collection instruments

According to William, et al., (2010), there are two types of data, primary and secondary data. The primary data are those which are gathered for the first time and afresh and thus collected for the case at hand (Kothari, 2004). Secondary data is defined as data that have been previously collected for some purpose other than the one at hand. For the purpose of this study in order to obtain relevant information only primary data will be used. The primary data will be collected through face to face interview and by distributing structured questionnaire. In this study structured questionnaire which includes both open ended and close ended questions will be used. The reason to use close ended questions is because of it is simple for respondents to answer and for data analysis. If the question is too long respondents boarded and it is because to lose the exact values of the responses. Moreover questionnaires with five likert scale options will be prepared and distributed to respondents. Moreover, questionnaires are advantageous in collecting large number of data from large number of respondents and help respondents to fill the questionnaire at their convenient time without the interviewer bias. And the study also used interview because interview has a higher response rate and it clarify the questions well if the questions are not clear, since questionnaire doesn't.

3.5. Target Population of the study

The target population of this study is employees of Infinity Advanced Technology solutions P.L.C medical equipment supplier. It has a total of around 160 employees with both permanent and contractual agreements. But from the total employees only 140 of them are permanent employees. It is too small to draw sample from the given population. Therefore, this study will use census method.

3.6. Methods of Analysis

According to the nature of data which the researcher will collect, both descriptive and econometric techniques will be employed. The descriptive part of the study helps the researcher to describe the effects of inventory management on service delivery. The descriptive statistics that was included in this study are quantitative measures such as mean, standard deviation, tables and supported by qualitative analysis like likert scale frequencies. The study also used econometrics model to show the relationship between service deliveries with explanatory variables particularly with inventory management. The model estimation technique was examined by Ordinary least square (OLS) estimation technique using statistical package for social sciences (SPSS) 2020 software.

3.7. Model specification

Model specification refers the mathematical presentation of the relationship between variables and identifying which variables are independent and which one is dependent. In this study service delivery was used as dependent variable. Independent variable includes demographic characteristics of respondents (education level and experience of respondents in the organization), inventory management practice, procurement practices, warehouse storage practices, and transportation practice. Ordinary least square (OLS) estimation method was employed. Linear least squares regression has earned its place as the primary tool for process modelling because of its effectiveness and completeness (Gujarati, 2004). The general model is specified as follows:

ESD = f (EDU, EXP, IMP, PP, WSP, TPDM)

The specific model for this study is presented as follows:

$$\mathrm{ESD}_i = \beta_0 + \beta_1 \mathrm{EDU}_i + \beta_2 \mathrm{EXP}_i + \beta_3 \mathrm{IMP}_i + \beta_4 \mathrm{PP}_i + \beta_5 \mathrm{WSP}_i + \beta_6 \mathrm{TPDM}_i + \varepsilon_i$$

Where

ESD = Effectiveness of Service Delivery

EDU = Education Level of Respondents

EXP =Years of Experience of Respondents

IMP = Inventory Management Practice

PP = Procurement Practices

WSP = Warehouse Storage Practices, and

TP = Transportation Practice

$\beta_i$and ε_i represents paremeters (coefficiet of variales)and disturbance term respectively.

3.8. Description of variables

Effectiveness of service delivery (ESD): it is the dependents variable measured by using likert scale qualitative data. It has eight items and the response of respondents for each item is averaged and used in the regression.

Education level (EDU): it is an explanatory variable measured as a categorical variable by classifying it as diploma, BSC or BA degree holder, master's degree holder and other.

Years of experience of respondents (EXP): it is also a categorical variable. It takes 1 for employees serving the organization 1 to 5 years, 2 for those who serve the organization from 6 to 10 years, and it takes 3 for those serving the organization from 11 to 15 years and the last is 4 indicating years of experience of more than 15 years.

Inventory Management Practice (IMP): it is an independent variable measured as the average of 12 questions (reported in the appendix) respondents' response. The measurement is similar for procurement management, transportation and distribution management, warehouse practice and supply chain management, and procurement of medical equipment.

3.9. Reliability ad validity of the data used in this study

In this study reliability of the data was determined by Cronbach Alpha. To say the data is reliable,if it produces similar results under consistent conditions, the test statistics value should be greater than 0.6. on the other hand, validity of the data were checked by using pilot methods at which before all questionnaire is printed and distributed only small number of

questionnaires were distributed and based on the feedback that the researcher gets from the pilot survey the questionnaires was modified.

CHAPTER FOUR

RESULT AND DISCUSSION

4.1. Introduction

In this chapter the presentation, interpretation and analysis of the data collected through structured questionnaires. The researcher distributed 140 questionnaires and collected 136 of them which are 97.14 percent of the total sample size. According to Mugeda (2003) response rate of above 70 percent are very appropriate. Here below both descriptive and inferential analysis of the data were discussed.

4.2. Reliability test

Reliability is the degree of consistency of the instruments used to measure the attributes. The most frequently used methods of testing reliability of the data is Cornbrash's Alpha. As jn Cronbach (1951) proposition reliability test statistics of 0.7 and above is considered as acceptable, particularly in social science studies. As can be seen on below table 4.1 all of the variables have a statistics of 0.7 and greater. Thus the data used in this study is appropriate.

Table 4.1: reliability test statistics

Variables	N of items	Cronbach's Alpha
Effectiveness of service delivery	8	0.669
inventory management practices	12	0.903
Transportation and distribution management practice	9	0.841
Procurement of Medical equipment	6	0.792
Warehouse practice on Medical Equipment Supply Chain Management	4	0.848
Overall	39	0.945

Source: survey result, 2021

4.3. Demographic characteristics of respondents

4.3.1. Gender Distribution of Respondents

Among 136 respondents the majority or 100 (73.5%) are male and the remaining 26.5 percent of respondents are females.

Table 4.2: gender distribution of respondents

	Frequency	Percent	Cumulative Percent
Male	100	73.5	73.5
Female	36	26.5	100.0
Total	136	100.0	

Source: survey result, 2021

4.3.2. Marital Status of Respondents

From the total respondents 36 percent are married and 39 percent are single. On the other hand, 8.1 and 16.9 percent are widow/widower and divorced respectively.

Table 4.3: marital status of respondents

	Frequency	Percent	Cumulative Percent
married	49	36.0	36.0
single	53	39.0	75.0
widow	11	8.1	83.1
divorced	23	16.9	100.0
Total	136	100.0	

Source: survey result, 2021

4.3.3. Education level of respondents

As it is shown in the table below, 11 (8.1%) of them have diploma, 72 (52.9%) of them are degree holders and 29 (21.3%) of them has a master's degree and above. The rest 24 (17.6%) of the total respondents are other degree holders. Majority of the respondents are took formal education and certified on inventory management practice. This implies that they were fit to give relevant response to the research questions based on formal knowledge and skill.

Table 4.4: Education level of respondents

	Frequency	Percent	Cumulative Percent
Diploma	11	8.1	8.1
BSC degree	72	52.9	61.0
Master's degree	29	21.3	82.4
other	24	17.6	100.0
Total	136	100.0	

Source: survey result, 2021

4.3.4. Years of experience of respondents

Concerning respondents' work experience, below table shows that 63(46.3%) of the total respondents served 1-5 years, 46(33.8%) of them served 6-10 years, 27(19.9%) of them served above 15 years. This implies that the majority of the respondents have a good experience on inventory management practice and better understanding of the research questions

Table 4.5: Years of experience of respondents

	Frequency	Percent	Cumulative Percent
1-5 years	63	46.3	46.3
6-10 years	46	33.8	80.1
above 15 years	27	19.9	100.0
Total	136	100.0	

Source: survey result, 2021

4.3.5. Current positions of respondents

As it was indicated in the table below, 9 (6.6%) of the total respondents are working on procurement office, 23 (16.9%) of them are forecasting and capacity building, 61 (44.9%) of them storage and distribution, 34 (25%) are working on fund management office and 49 (6.6%) of them working in other departments. This implies that there are enough respondents from each job category that helped the researcher to triangulate the responses collected by different data collecting instruments.

Table 4.6: Current positions of respondents

	Frequency	Percent	Cumulative Percent
Procurement	9	6.6	6.6
Forecasting and Capacity Building	23	16.9	23.5
Storage and Distribution	61	44.9	68.4
Fund Management	34	25.0	93.4
others	9	6.6	100.0
Total	136	100.0	

Source: survey result, 2021

4.4. Descriptive statistics of respondents

4.4.1. Effectiveness of service delivery

As explained by Chih-hui (2011), mean scores are standardized as very low performance (1-1.9), low performance (2 – 2.8), moderate performance (2.9 – 3.4), high performance (3.5 – 3.9), very high performance (4 – 5) (Chih-hui, 2011). As a result the availability of demanded equipment by the customers is the first item used to measure the effectiveness of service delivery and it shows that the mean value of 2.79 indicating low performance of supplying the medical equipment with standard deviation of 1.11 which implies there is higher variation from its mean value. However, the performance of Infinity Advanced Technology solutions private medical equipment supplier on timely delivery of the service is moderate with a mean value of 2.93 and its standard deviation is 1 lower as compared to the standard deviation of the first item. Sometimes organizations allow customers to raise complaints or suggestions. But organizations do not answer the complaints raised quickly. To identify this respondent were asked to answer the timely and clear responses of the organization. The mean of respondents is 3.26which indicate moderate performance of answering the questions and implementing the suggestions raised by the customer and the standard deviation is 0.998.

The other item is that respondents asked was whether the organization conducted customer satisfaction survey on the quality of the medical equipment. Respondents answer shows that the survey is conducted but it is moderate level. That means it needs more investigation of customer satisfaction. On the other hand the operational performance of the organization is low with the mean respondent's response of 2.99 and its standard deviation is 1.158 which

shows higher variation. As can see below inventory items are not purchased based on customers' quality requirements, because the mean value of the respondentsis 3.13 indicating moderate performance.

Table 4.7: Effectiveness of service delivery

		mean	Standard dev.
1	Availability of all demanded medical equipment's by the customers	2.79	1.11
2	On time delivery of the service to the customers	2.93	1
3	On time and clear responses to complaints or suggestions by the customers	3.26	0.998
4	Customers satisfaction (rating) on the quality of the medical equipment	3.26	0.935
5	Operational performance of your organization	2.99	1.158
6	inventory items are purchased based on customers' quality requirements	3.13	1.147
7	customer satisfaction survey was applied to measure customer satisfaction level	3.39	1.027
8	The extent of Customer satisfaction level in terms of delivering the right product with the right quality and quantity at the right time	3.93	0.574

Source: survey result, 2021

4.4.2. Inventory management practices

As the response of respondents indicate that there is available purchasing procedure with the mean and standard deviation of 3.52 and 0.966 respectively. On the other handinventory control system in the organization is not effective to optimize customer service, inventory costs, and operation costs with the mean value of 3.06. Software application and tracking system that help better inventory management decisions and save a significant amount in cost associated with manual inventory counts, administrative errors, and reductions in inventory stock outs. As illustrated below there is no way to find optimal order size in their practice, for this reason, they are under considering holding safety stocks that required to maintain complement to a minimum equipment list of each aircraft. The main reason behind all these is air logistics

supply chain system is designed manually and exposed to administrative errors and reductions in inventory or stock outs.

But they don't have any mechanism knowing operational units individual item forecasted consumption rate and their minimum, reorder, and the maximum level of each item to fulfil before asked by operational units. So that, their inventory management decision is based on guesstimates and limited to use optimal the annual budget and its mean value is 3.93 with the standard deviation of 0.776. The organization does not adhere to its inventory management policies and procedures to protect materials against theft, damage and loss. This is because of the respondent's response with the mean value of 3.13 which shows moderate performance in the organization. But it can indicate that if the organization acts based on inventory management policies and procedures the loss and damages of the stock will be minimized. Despite this the organization has god performance on receiving medical equipment's based on the specifications ordered, quantity and quality standards. For this question the mean value is 3.67.

As indicated on the table below the respondent's response show that proper and effective on job training does given to the professionals that directly involved in pharmaceutical inventory management and the mean value of the answers of respondents is 2.27 which shows low performance on training. But training is indispensable to enable employees in the form of knowing the practice of inventory management and increases efficiency of employees and in turn the service delivers performance of the study. In general, the existence of the indicated responses implies that there is lack of competitive based purchasing policy that gives a chance to all possible suppliers to fairly compete for common benefit of the buyer and suppliers and lack of sharing information between purchasing, and warehouse departments to have a common understanding about the overall status of inventory items and decide what items to be purchased.

Table 4.8: Inventory management practices

	inventory management practices	**mean**	**Standard dev.**
1	Availability of effective purchasing procedure in Your organization	3.52	0.966
2	Inventory control system In the organization is effective to optimize customer service, inventory costs, and operation costs	3.39	1.09
3	Because of too much inventory your organization has been unable to provide better customer service	3.06	1.066
4	Your organization's managers have optimized stock level	3.93	0.776

	techniques that need to be kept in the warehouse (maximum, minimum and safety stock levels)		
5	inventory management systems that provides information regarding each types of medical equipment are fully computerized	3.68	1.017
6	Customer dissatisfaction (if any) is directly related with the poor inventory management practices	3.26	0.935
7	Your organization adheres to its inventory management policies and procedures to protect materials against theft, damage and loss.	3.13	1.024
8	There is insurance coverage for all medical equipment's	3.01	1.099
9	There is a proper quality control check whether the materials received are according to the specification ordered, required quantity and quality standards.	3.67	1.136
10	On Job training is given to the professionals that directly involved in pharmaceutical inventory management	2.27	0.856
11	allocates sufficient budget for the procurement	3.41	1.262
12	Management carry out review the reconciliation of physical inventory counts to the inventory records	3.35	1.201

Source: survey result, 2021

4.4.3. Transportation and distribution management practice

With regarding to the transportation and distribution management practice the first item is whether medicines are transported from the suppliers on time or not. The mean value of respondents answer on this question is 3.14 confirming moderate performance. This indicates that the shipped medical equipment's are not arrived on time and the respondent's response has variation of 1.09 which higher deviation from the mean of responses. However, only important medicines are transported from the supplier with the mean value 3.74 and standard deviation of 1.004. For appropriateness of medicines distributed to the dispensaries the mean values of the respondents response is 3.6 which show higher performance. On the other Hand for the other questions respondent's response ranges from 3.13 to 3.4, this shows moderate performance of transportation and distribution management practice in the organization. This indicates that there is no easy transportation system, no onetime distribution of medical

equipment's; there is no sufficient transportation vehicles for medical equipment, secure safety of equipment protected.

Table 4.9: Transportation and distribution management practice

		mean	Standard dev.
1	Medicines are transported from the suppliers in a timely manner	3.14	1.09
2	Only Important medicines are transported from the supplier	3.74	1.004
3	Appropriate medicines are distributed to the dispensaries	3.6	1.255
4	Medicines are distributed to the dispensaries easily	3.26	0.929
5	Medicines are distributed to the dispensaries timely	3.27	1.00
6	There are enough Vehicles for transportation of medical equipment	3.27	1.00
7	Delivery is done within recommended timelines	3.4	1.021
8	Safety of medical equipment is protected as required during transportation	3.4	0.801
9	Transportation practices of medical equipment are satisfactory	3.13	1.147

Source: survey result, 2021

4.4.4. Procurement of Medical equipment

Below presented mean score, 3.07 of respondent observation indicates that there is a moderate level of procurement of medical equipment with the standard deviation of 1.184, such as items are classified according to their economic value and importance (practicing ABC inventory management model) and their inventory management decisions made based on guesstimates. Mean score of respondents about the delivery of requested medical equipment's on time shows the same result as above i.e. there is moderate performance.

However, as the response of respondents show that there is a series problem on local suppliers and the procurements are not processed based on the plan of procurement. This is characterized by lower mean value of responses which are 2.73 and 2.54 with standard deviation of 0.774 and 1.034 respectively. The last item that respondents asked was

forecasting appropriateness and follow up to procure the medical equipment effectively and efficiently. The result shows moderate performance but here is a problem.

Table 4.10: Procurement of Medical equipment

		mean	Standard dev.
1	Medical equipment requested and delivered timely	3.13	0.806
2	The facility have good working relation with suppliers	3.2	0.98
3	There is ABC/VEN classification of medical equipment for procurement and budget allocation	3.07	1.184
4	Local suppliers‟ services are satisfactory to the facility	2.73	0.774
5	Procurement is being processed based on procurement plan	2.54	1.032
6	There is appropriate forecasting & follow up to procure efficiently and effectively	2.94	1.127

Source: survey result, 2021

4.4.5. Warehouse practice on Medical Equipment Supply Chain Management

The mean value of respondents answer for the availability of appropriate storage space within the facility is 3.14 with the standard deviation of 1.09. So in the organization storage space is moderate. That means there are some problems of providing sufficient space for the storage of medical equipment in the organization. The second item that respondents asked to measure the performance of warehouse practice on medical equipment practice is whether the storage equipment is fully functional or not. The mean value of respondents answer for this question is 3.47 which show that high performance. That means storage equipment is well functional. The result for the question about the checks performed to see the compliance of storage equipment is the same as the above. The last item is whether Infinity Advanced Technology solutions private medical equipment supplier implements standard operating procedures or not. Respondent’s response shows that it has high performance on the implementation of the procedure.

Table 4.11: Warehouse practice on Medical Equipment Supply Chain Management

	Warehouse practice on Medical Equipment Supply Chain Management	**mean**	**Standard dev.**
1	Appropriate storage space is available within the facility	3.14	1.09
2	Storage equipment are Fully functional	3.47	1.088
3	Storage equipment are regularly checked for compliance	3.47	1.088
4	Existing SOP[1]s that are followed to ensure proper storage	3.53	1.025

Source: survey result, 2021

4.5. Econometric analysis

4.5.1. Model summary

On table below the model fitness is discussed. Explained sum of square is 35.14 and the residual sum of square is 6.280. This shows that the total sum of square which is the summation of the two components confirming the included variables are best explained by explicitly listed variables. The F-statistics is 120.31 and probability greater than F-statistics is 0.000. Finally coefficient of determination (R-square) 0.848 which means 84.8 percent of variation of service delivery effectiveness is explained by the variables listed in this model. These variables are inventory management practice, transportation and distribution management practice, procurement of medical equipment, warehouse practice on medical equipment supply chain management, and demographic characteristics of respondents (years of experience in the organization and level of education of respondents).

Table 4.12: Analysis of variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35.142	6	5.857	120.307	.000[b]
	Residual	6.280	129	.049		
	Total	41.422	135			

Source: survey result, 2021

[1]Standard Operating Procedures

Table 4.13: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.921[a]	.848	.841	.22064

a. Predictors: (Constant), Education level, PME, Experiences, TDMP, IMP, WPME

Source: survey result, 2021

4.5.2. Model estimation and interpretation

The inferential statistics is examined by using effectiveness of service delivery in Infinity Advanced Technology solutions private medical equipment supplier in Bole sub-city. All except education level have statistically significant effect on the dependent variable.

Inventory management practice and service delivery: improvement in inventory management through the application of appropriate software, determining the optimal order size using the appropriate model, designing appropriate purchasing procedure, minimizing the cost of purchasing by the customers, providing insurance coverage, on job training to professionals who involved in pharmaceutical inventory management increases the effectiveness of service delivery by 0.366 likert point at 1 percent level of significance.

Transportation and distribution management practice and effectiveness of service delivery: transportation and distribution management practice has statistically significant effect on effectiveness of service delivery at 1 percent level of significance. Improving the management of medical equipment materials transportation and distribution system through supplying to customers and stores on time, allocating sufficient vehicles, protecting the equipment by safety materials increases the service delivery of the organization by 0.283 point.

Procurement of Medicalequipment and effectiveness of service delivery: unlike to other variables procurement of medical equipment has negative significant effect on the performance of service delivery. In this study procurement of medical equipment is measured by like scale and the response of majority of respondents for each item is disagreeing. This confirms that the facility has no good relation with the suppliers, there is no ABC/VEN classification of medical equipment, low performance of the local suppliers, procurements are not processed based on procurement plan, and there is effective and efficient forecasting and

follow-up. Thus this procurement medical equipment in the organization negatively affects effectiveness of service delivery by 0.693 at 1 percent level of precision.

Warehouse practice on medical equipment supply chain management and effectiveness of servicer delivery: thepractice of warehouse medical equipment supply chain has also positive significant effect on service delivery performance of Infinity Advanced Technology solutions private medical equipment supplier. Improving warehouse, and equipment supply chain through appropriate storage store, fully functional storage equipment, regularly checked storage equipment compliance, and following SOPs increases the effectiveness of service delivery by 0.141 likert scale point at 5 percent level of significance.

Experience and effectiveness of service delivery: Employee's years of experience in the organization affects service delivery performance.An increase inyears of experience increases the performance of service delivery by 0.218 at 1 percent level of significance. This may be because as employees stay many years in the organization his/her knowledge and skills on how inventory management is practiced in the organization improves. Moreover employees will adopt the process of medical equipment and will exhibit learning by doing skills.

Table 4.14: regression result of the model

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.083	.191		10.896	.000
	IMP	.366	.060	.481	6.147	.000
	TDMP	.283	.065	.351	4.336	.000
	PME	-.369	.057	-.464	-6.487	.000
	WPME	.141	.064	.227	2.226	.028
	Experiences	.218	.034	.442	6.414	.000
	Educationlevel	.028	.029	.045	.992	.323
a. Dependent Variable: Effectiveness of Service Delivery						

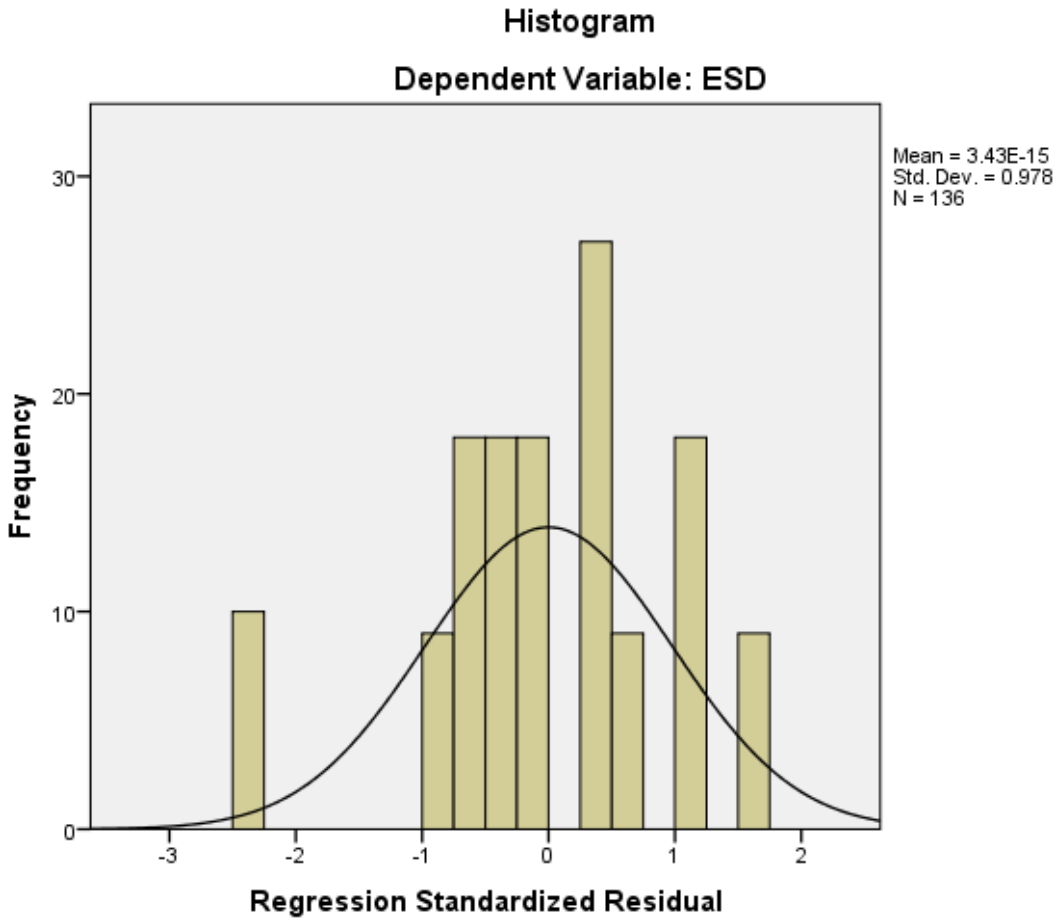
Source: survey result, 2021

4.6. Post estimation test

4.5.1. Test for normality

Normality test is used to determine if the data is well-modelled by a normal distribution and to compute how likely it is random variable is underling the data is set to be normally distributed. In descriptive statistics terms, one measure of goodness of fit a normal model of

the data. The null-hypothesis assumes that error terms are normality distributed. Normality of data is tested by plot against histogram test.As indicated in below graph and visual inspection of the researcher, the assumption of normality has been met because the sample data produced bell-shaped curve having a peak in the middle with a balanced Skewness of 3 and -3. This implies that the data were approximately normally distributed (Asghar, 2012.).



4.5.2. Test for multicollinearity

Multicollinearity refers to the condition that independent variables are inter-correlated and it is the future of sampler not for the population. The classical linear regression model assumes that there in multicollinearity among the explanatory variables are indeterminate and there standard errors are infinite. On the other hand if multicollinearity is less than perfect, the regression coefficient, although determinate, have larger standard error (in relation to the coefficient themselves) which means the coefficient cannot be estimated with greater precision or accuracy.

Variance inflated factor (VIF) is used to determine whether there exist the problem of multicollinearity in making inferences. When VIF>10, there is the problem of

multicollinearity and hence we cannot reject the hypothesis of no correlation among explanatory variables. There are some remedial measure suggested to the problem of multicollinearity such as priori information from previous empirical works, combining both cross section and time series data. One of the simplest things to do is dropping the variables which are highly correlated and specification bias. The variables should also be transformed when they tend to move in the same direction (Gujarati, 2004). The variance inflation factor value of each variable is less than 10 whichconfirming explanatory variables have no perfect correlation or there is no problem multicollinearity among independent variables.

Table 14.5: multicollinearity test

	Tolerance	VIF
IMP	.283	3.530
TDMP	.257	3.886
PME	.331	3.020
WPME	.177	5.644
Experiences	.358	2.794
Education level	.594	1.684

Source: survey result, 2021

4.5.3. Test of autocorrelation

The correlation between residuals is called autocorrelation which is induced by the transformation of the original data and manipulation of the data through interpretation and extrapolation. The simplest and most widely used model is one where the error term u and ut-1 have a correlation ρ. For this model one can think of testing hypothesis about ρ on the base of estimated correlation coefficient between the residuals. A commonly used statistic for this purpose is the Durban-Watson (DW) statistic which is denoted by dw. When DW statistic is zero (d=0) the estimated correlation coefficient is 1 and d=4 when the correlation coefficient which is estimated is -1. If d is closer to 0 or 4, then the residual are highly correlated. The standard d statistic that serves as a rule of thumb is d =2 which indicates that the estimated correlation coefficient is 0 and hence the residual are not correlated. For this study the test statistics is 2 which confirm that there is no problem of autocorrelation.

Table 4.16: test of autocorrelation

Durbin-Watson
1.927

Source: survey result, 2021

4.5.4. Hypothesis Tests

The regression result shows that all of the coefficients of the independents are in line with the hypothesis formulated. For instance, it was hypothesized that inventory management practice, transportation and distribution management practice, and warehouse practice on medical equipment supply chain management have positive significant effect and the result as reported on the above table 4.14 confirms this hypothesis. Finally procurement management has negative effect, which is also similar with the hypothesis.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1. Major Findings

Before using the data the researcher checked the reliability of the data using Cronbach's Alpha and the result confirms the appropriateness of the data for this study by having test coefficient of greater than 0.7. From 136 respondents the majority (73.5%) are male and 36% are married with the majority of respondents (39%) are single. The highest proportion of the respondents is BSC/BA degree holder and the least percent of the respondents (8.1%) are diploma holder. The highest proportion of the respondents served the organization for 1 to 5 years followed by employees (33.8%) serving the organization from 6 to 10 years.

The dependent variable (effectiveness of the service delivery) has 8 items. Among this for the availability of all demanded medical equipment's by the customers, the mean value of respondent's response is 2.79, which is low performance according Chih-hui (2011) classification. While the other items mean value of respondents response shows that it is greater than 2.9 which show moderate performance. While for inventory management practice there were 12 items. Among this on the job training provided to professionals mean value are 2.27 with standard deviation of 0.856. While the remaining items have a mean value ranges from 2.93 to 3.93 indicating under inventory management there is good practices and very good performance for different items.

In the organization transportation and distribution management practice has very good performance. This is because for all items the mean value of respondent's response is greater than 3. The same result is found under warehouse practice and medical equipment supply chain management. On the other hand for procurement and medical equipment respondent observation indicates that there is a moderate level of procurement of medical equipment with the mean of 3.07 of and standard deviation of 1.184. However, as the response of respondents show that there is a series problem on local suppliers and the procurements are not processed based on the plan of procurement.

5.2. Conclusions

In this study the effect of inventory management practices on service delivery of Infinity Advanced Technology solutions private medical equipment supplier.Based on the findings of the study the researcher concludes the following points:

In the organization the service delivery of medical equipment are affected by many factors and its overall performance is moderate, though for some items the problem is sever. For instance, availability of all demanded medical equipment's by the customers is the major problems. However, inventory management practice has good performance for all items in in general and for each item in general. The other variable used in this study is procurement of medical equipment. For this variable the overall practice in a good performance. However, local supplier's services are satisfactory to the facility and procurement does not processed based on procurement plan. We I see the transportation and distribution management practice of the organization; its overall performance is good, but for two items in transporting important medicines and distributing it to dispensaries the organization has very good performance. Finally, warehouse practice on medical equipment supply chain management and for all of its items the mean value of respondent's response has moderate performance.

In addition to descriptive statistics multiple linear regression analysis was conducted by using SPSS 2020. The result revealed that effectiveness of service delivery is significantly affected by inventory management practice, transportation and distribution management practice, warehouse practice on medical equipment supply chain management, procurement of medical equipment, and years of experience of employees.

Thus practiced physical inventory management in the organizationwere, obsolete, expired, or damaged inventories properly identified, management have review the reconciliation of physical inventory counts to the inventory records, keep one location in the same health commodity item and inventory records reconciled (and differences explained) to advantage reports on a regular basis (Current inventory is adjusted at year-end by fiscal yearend physical counts but, the hospital uses Electronic Data Interchange Technology (EDI) and the hospital uses automatic stock tracking not practiced in the organization.

Other challenges faced , weak management system, lack of proper training of inventory management, insufficient funds for procurement, experience for stock out of health commodities, the length of bureaucratic processes in the procurement system and lack of

funds to procure the health commodities, lack of technology in inventory management is also another challenge. In general the consequences of the above were occurred high level of stock out which might have leaded to services interruptions in the organizations medical commodities.

5.3. Recommendation

It is recommended that improve the management system , appropriate personnel involved in quantified & procurement process ,it need the government to review the public procurement policy for minimize bureaucratic processes in the procurement system, adequate budget should be available because of to prevent stock out of health commodities. In other hand engagement with, NGOs, PFSA and other supplies to work strongly to avail all health commodities required for health commodities and to minimize if possible to avoid stock out.

Finally, using software technology for keeping records instead of manual methods can help in improving inventory management and using stock cards and updated bin cards should beregularly used for all products to track the level of stock and prevent stock outs to minimize services interruptions for all health commodities stores .It is also recommended that all stores should be adopted good inventory management practices by NGOs supported for program store. In addition to that members of staff should have been trained in inventory management. These had inventory management knowledge which improves the availability and the quality of services in the organization.

5.4. Suggestions for Further Study

As indicated by predictive power of the model, there are factors which have not been properly accounted by this study due to its scope. It is therefore suggested that further research should be done to further explore other factors which can influence inventory management such as the recording practice, and others. It is imperative also to study the inventory management practice at all levels of healthcare supply chain.

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