

**ASSESSMENT OF THE DETERMINANTS TOWARDS INVENTORY
CONTROL PERFORMANCE IN PUBLIC HOSPITALS IN TANZANIA;A
CASE OF SELECTED PUBLIC HOSPITALS IN DAR ES SALAAM
REGION.**

By

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**A Dissertation submitted in Partial Fulfillment of the Requirement for the
Masters of Science in Procurement and Supply Chain Management
(Msc.PSCM) of Mzumbe University of Tanzania.**

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CERTIFICATION

We, the undersigned, certify that we have read and hereby recommend for acceptance by Mzumbe University, a dissertation entitled, **Assessment of determinants towards inventory control performance in public hospitals in Tanzania; A case of selected public hospitals in Dar es salaam region**, in partial fulfillment of the requirements for the award of the degree of Master of Science in Procurement and Supply Chain Management of Mzumbe University.

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DEDICATION

This dissertation is dedicated to my beloved parents Mr. Shadrack M. Mhagama and Mrs. Nuru C. Msigwa, For your unconditional love and support.

LIST OF ABBREVIATIONS

ARV	Antiretroviral
EOQ	Economic order Quantity
EU	European Union
HIV	Human Immune deficiency Virus
JIT	Just in Time
JICA	Japan International Cooperation Agency
KMO	Kaiser-Meyer-Olkin
MSD	Medical stores Department
MRO	Maintenance, repair and Operation
MoH	Ministry of Health
Msc.PSCM	Masters of Social Science in Procurement and Supply Chain Management
OIG	Office of Inspector General
PCA	Principal Component Analysis
PMU	Procurement Management Unit
RRHs	Region Referral Hospital
SPSS	Statistical Packages for social scientists
TCA	Transaction Cost Analysis
VED	Vital, Essential and Desirable
WHO	world health organization

ABSTRACT

This dissertation was about to analyze the determinants towards inventory control performance in public hospitals in Tanzania. The specific objectives were to examine medical stock storage systems for hospitals and their influence on inventory control performance, to assess the effect of staff competence on inventory control performance, and to establish the suppliers' influence on performance of inventory control. The study was conducted in selected public hospitals located in Dar es Salaam region. From the population of 198 a sample of 99 respondents was obtained. The methods of data collection were questionnaire and interviews the selection techniques of the respondents were purposive sampling and simple random sampling. This study involved mixed strategies which were qualitative and quantitative analysis. From the study, it was observed that the engagement of medical stock storage system which influence inventory control performance were storage location, size of warehouse, warehouse layout. Due to analysis, the researcher found that medical storage systems have significantly influence on inventory control performance. However, the analysis showed that training for incoming employees and development for existing employees are important to any organization. The suppliers which brought about influence on inventory control were capability, and delivery influence. The analysis showed suppliers have insignificantly influence on inventory control performance. The recommendations are management should make sure that they have competent staff and develop them who are in-house so as to help in the running of the system. The public hospital and other organization should take an action to improve communication and information system to assist in monitoring of inventory especially between vendors and public hospitals. Also, Organizations should allow their employees to attend training provided by PSPTB so as to improves their staff professionalism and hence obtain value for money.

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CHAPTER ONE

BACKGROUND OF THE STUDY

1.0 Introduction

This chapter consist the background of the study, statement of the problem, objectives of the study, research hypothesis, significance of the study and organization of the study.

1.1Background of the study

Inventory comprises of products possessed and held for administration conveyance. Inventory may incorporate crude materials in assembling enterprises, restorative supplies in wellbeing offices, goods in-network shops, and numerous others. Stock is a venture yet, in addition, a potential wellspring of misfortune that should be deliberately controlled (Rajab, 2017).

Inventory control is a challenge to many private and public sectors because they must ensure they always have an optimum amount of inventory; not too much and not too little. Too much inventory is not only wastage of money in storing but also in case they are damaged or stolen; too little inventory is a risk as it is more likely that customers will not always be satisfied with the service that is provided and subsequently loose them (Achieng et al., 2018).

In most East African countries, inventory control is critical in public health sector, specifically medical inventory. It is reported that approximately 70% of drugs are procured from overseas using donor funds (Brooks, 2018). Some studies believe that this is a major cause of drugs shortage. Tanzania is one of these countries and regularly face shortage of essential drugs, recent of which being ARV for HIV patients (Otieno, 2018); also a study by (MoH, 2018) suggested that one of the major problem facing RRHs is inadequate medicine and equipment. Moreover, (EU, 2018) says that drugs shortage is the result of unreliable supply system and inefficient stock monitoring system.

Some studies suggests that this is due to the fact that the government relies largely on donor funds for financing drug purchase and long procurement procedures as most of these drugs are ordered from overseas.

However a report by Wales et al. (2014) points out that the problems runs much deeper than only the unpredictability of funds and procurement procedures. It points out that lack of planning and accountability as other associated problems. A report by (Wangwe, 2014) highlighted that medical stocks shortage can also be attributed to delayed orders or the fact that many of these drugs were never ordered in the first place, presumably this can be attributed to poor documentation. Furthermore, a report by OIG (2018) addresses the issues of stock out and expiries of drugs being caused by poor storage and not having enough staff in the health facilities who some of them lack necessary skills for monitoring of medical inventory.

Moreover, Lopez et al. (2014), stresses the fact by pointing out poor record keeping, lack of capability of hospital's staff to correctly order and control medical stocks as contributing factors resulting to medical stock outs or overstocking. This brings to light that, the problem goes beyond financing into Inventory control (in this case medical stock) in the medical warehouses to the supply chain management.

Therefore as highlighted earlier, it can be deduced that the problems starts from aspect of medical inventory control in the warehouses or hospital pharmacies. Poor performance in medical control leads to expiration of drugs, delayed orders, damaged orders or wrong orders. All these will generally result to medicines stock outs or overstocking and thus citizen's dissatisfaction of the service offered by a given health facility and unnecessary costs to hold inventory.

It is the interest of this study to look at the contributing factors to the performance of inventory control, in this particular case medical stock, and to what extent they affect the performance of a health facility in the stock control aspect for public health hospitals in Tanzania, a case study taken being selected public hospitals Dar es Salaam region.

Dar es Salaam region has several public hospitals, notable ones being Mwananyamala, Temeke, Amana and Sinza. This study hopes to collect information from these hospitals and later comes with conclusion and suggestions on determinants towards effective inventory control performance.

1.2 Problem Statement

Despite of inventory being an essential tool for running an organization, still most of public health hospitals in Tanzania fail to find the right balance of inventory level hence resulting to failure in meeting customers' demands and satisfaction, in term of availability of medicines in time, their adequacy and quality (expire date).

Mikkelsen-Lopez et al.(2014), pointed out this has been partly caused by aspects of inventory control like delayed and/or wrong orders, incapability of staff to control inventory in terms of handling, forecasting and records keeping. Moreover (Nallusamy et al. 2018) suggest that one of the most aspects of inventory control is to have the items in stock whenever they are needed. However due to several seasons the above case has not be met by most public hospitals. Thus, this study is determining whether suppliers, storage system and staff competency has influence inventory control performance in public health hospitals.

1.3 Research objectives

1.3.1 General Objective

To assess the determinants towards inventory control in public health hospitals, Tanzania

1.3.2 Specific objectives

- i. To examine medical stock storage systems for hospitals and their influence on inventory control performance.
- ii. To assess the effect of staff competence on inventory control performance.
- iii. To establish the suppliers' influence on performance of inventory control

1.4 Research hypothesis

- i. There is positive relationship between storage systems and inventory control performance.
- ii. There is positive relationship between staff competence and inventory control performance.
- iii. There is positive relationship between suppliers and inventory control performance.

1.5 Significance of the study

From the findings, the researcher hopes the study will help most of the public health facilities in Tanzania to identify key areas in terms of medical stock control that can be improved to enhance the overall performance in the aspects of medical stock cost and efficiency of the services provided by ensuring that all the essential drugs available all the time.

Also this study is expected to come with challenges that affect medical control system in public health facilities and suggest on the best way to improve service delivery within the health facilities. The researcher hopes that such findings help decision makes on the ways of insuring that essential medicine are always available in the hospitals, pharmacies and stores when they are needed but also avoiding unnecessary holding cost.

Moreover this study serves to unveil strengths and weaknesses but also suggest proper approach to medical inventory control. Thus result used by medical stock staff in improving their day to day operations.

Lastly the findings from this study maybe well suited to student and other professionals who may be interested in researching on related study.

1.6 Scope of the Study

The study aimed at assessing medical inventory control performance for public health facilities in Tanzania, a case study of selected public hospitals in Dar es

Salaam region. The study concentrated in the major selected public hospitals in Dar es Salaam, which are Mwananyamala, Temeke, Amana and Sinza. The national hospital, Muhimbili, shall not be part of the study. The study looks at storage systems, staff competence and suppliers as determinants for medical inventory performance.

1.7 Organization of the study

This study is arranged according to the chapter. The first was introduction made up of the background of the study, the statement of the problem, the aims and the objectives of the study, again the research hypothesis, significance of the study, scope of the study and the organization of the study itself. Chapter two was the literature review and in this portion was being analyze how different writers brought to bear some comprehensive piece of others in relevance to the subject, while chapter three was analyze methodology and went more to discuss how raw data, information, and together with the population was used for this study. Chapter four handled the most findings of the study. Chapter five, it provides a detailed analysis and also the responses to the form sent out for the aim of this study. Chapter six that was the conclude chapter offers outline of the findings of the study suggestions, and recommendation.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter provides a thorough definition of terms and concepts used in this study, illuminate the theoretical foundation and put together what other have written about inventory control, Inventory control model and conceptual framework.

2.1 Theoretical literature review

2.1.1. Definition of terms review

2.1.1.1 Meaning of Inventory

Inventory is defined in various ways by different authors and/or researchers depending on the context of their respective researches and studies; Bhandari, (2015) defines Inventory as current assets or in other words they are tangible assets held by organization.

Kant et al. (2015) defines inventory as a detailed itemized list of assets held by an organization or institution like goods in stock, drugs and equipment. Furthermore, he outlines inventory as a method of maintain stock of goods at a level of lowest purchasing and stoking costs without interference with supplies.

Moreover, Rajab (2017) says inventory consists of all goods owned and held for customers' satisfaction. This is to ensure that there are little chances of stock out so that customer's demands are always met.

As highlighted in the definitions above, inventory meaning vary notably depending on the subject discussed, for example, In producing terms, inventory may defined as a stock of raw materials, semi-finished merchandise, and finished merchandise, industrial plant provides and spares. While in cases of business and institutions, stocks may refer to a stock of finished goods waiting to be sold to

customers who are consumers, for examples in hospitals inventory includes Medical equipment and Medicines.

Generally, inventory can be defined as tangible materials that businesses/industries/institutions holds for production of goods or finished goods for sale to customers in near future. They are essential for holding the production wheels moving to keep the market going and the distribution system intact (Godan and Ngugi, 2014).

2.1.1.2 Inventory control

According to Muiruri and Mwangangi, (2017), inventory control is the liable way in which organizations are figured out how to guarantee clients are fulfilled and organization stays in activity through minimization of low sales. Inventory control is general deals with acquisition, storage, handling and use of inventories so as to ensure the availability of inventory whenever needed, providing cushion for uncertainties thus deriving maximum profit and minimizing wastage and losses (Waters, 2018). Also Nzuza (2015), describes inventory control as the process in which the materials and parts carried stocks are regulated within predetermine limits in accordance with policy of organization. Proper inventory control allows freeing a significant amount of asset which was in form of stock thus increasing the efficiency of resources use (Ziukov, 2015).

2.1.1.3 Inventory control system

Inventory control systems are set of policies that manage and control inventory level and determine what level should be maintained, when stock should be replenished, at what quality and quantity required and when is required, therefore key issues defining the particular inventory control system are timing (when to order?) and quantity (how much to order?). Inventory control systems ensure the organization meets required demands while avoiding costs of overstocking (Mapes, 2015). The following are the inventory control systems.

Single period inventory systems: this is the inventory control systems used for one period. It is especially used for perishable products like foods. Multi-period inventory systems: there are two of them which are; fixed order quantity system; this is the inventory control system where the maximum and minimum inventory levels are fixed. Fixed time period system; this is the inventory control system wherein, orders are periodically placed, but the quantity is different every time.

2.1.2 Why holding inventory

Holding inventory requires space, security, and proper handling. There are costs associated with each of the requirements which can considerably affect the performance of the business or manufacturing entity but it is worthy taking the risk if the inventories are properly managed and controlled. Here are the reasons of holding inventory;

Ensure continuation of production

This suits best in manufacturing industries. If you are a manager you do not want the production to seize just because of stock out of raw materials and/ or production tools, especially when the market for your products is huge because of the fear of losing your potential customers and hence profit. Therefore it is essential that inventories are always available to ensure continuation of production (Mukopi and Iravo, 2015).

Attract discount for large purchase

Some organizations or institutions prefers to purchase products in bulk and keep them as inventories because in doing so there is the huge chance of getting discount from supplier, minimize logistics which will consequently reduce operation costs considerably (Modigliani, 1957).

Fluctuation of market structure

Some organizations/institutions choose to hold inventory so as to avoid the price fluctuation and /or seasonal availability products. This is to ensure that their planned budget is not affected by the variation of price in the market (Vrat, 2014).

Demand variability

Sometimes organization fails to estimate demand correctly or sometimes there are uncertainties of demand in the market, to cater for this additional inventory are required to act as cushion to observe the demand variability. The greater the demand variability or uncertainty the greater the amount of inventory is required (Materials Management, 2014).

2.1.3. Type of inventory

As highlighted in the definitions of inventory, various type of inventory can be derived (Vrat, 2014); these include the following:

Raw materials inventory; this type of inventory is known as input to the manufacturing system. They are basically materials that are converted via the manufacturing process into components and/or products.

Semi-finished goods; these are goods that are stored uncompleted, waiting for final processes that will get them different uses or to customer specifications

Work in progress inventory; these refer to all the materials and/or products in various stages of completion in the manufacturing system. This includes materials from raw materials that have been released for initial processing up to completely process materials waiting to be inspected and accepted as finished goods.

Maintenances repair and operating inventory (MRO) supplies; these includes spare part and indirect materials required for manufacturing system. These products are using in production but do not became part of final product.

Finished goods; these are complete products ready to be distributed to the customers. They are normally stored in the warehouse before they are hauled or shipped.

2.1.4. Cost associated with Inventory

The following are costs that are related to inventory Addy-Tayie (2012);

Holding cost

Holding cost is additionally alluded to as conveying cost. These are costs that are related to putting away stock before they are sold or utilized. These expenses incorporate Capital cost; this incorporates any cost identified with speculation made in stock, Storage space cost; this includes cost related to the place where the inventory is stored. They maybe the cost of the storage facility itself or the cost of renting the facility if it isn't claimed. It likewise incorporates business running cost like electricity and water supply, Service cost; this include cost of hiring personnel for material handling, receiving, storage and issuing of inventory and any other service costs. Risk cost; these are costs associated with obsolesces or shrinkage due to theft, damage, spoilage and devaluation of selling price.

Ordering cost

Ordering costs are cost of replenishing an order. These are general costs that are included each time that you place an order from the supplier. These expenses may include; Cost of preparing purchase order, transportation cost, and cost of findings suppliers.

Cost of shortage

Shortage costs are also referred to as stock out cost. These are cost that are incurred when an organization become out of stock for whatever reason. These costs may include payment for idle workers if the production stops and loss of loyal customers' and reputation.

In the past inventory control was not as important as it is now, excess inventory were considered as a sign of worth but in today world in order to reduce costs and remain competitive in the market, effective inventory control is essential (Closs, 1989). Keeping too much inventory takes a lot of physical space, creates financial burden, spoilage, and increases the possibility of damage and loss (Mbonyane and Ladzani, 2011). In contrary, less inventory usually disturb every day operation of the organization and increases the chances of losing the market due to poor customers services (Rajeev, 2008). Thus the main objective of effective inventory control is to get the right balance between too much and too little inventory (Kanguru, 2016). Properly sound inventory control always has positive influence on organization financial strength and competitive position in the market because it affects the working capital, operations, and customers services (Rajee, 2008).

2.1.6 Inventory control techniques

Different inventory control techniques are normally employed by different organizations so as to ensure they realize their objectives, these techniques include;

Always better control (ABC analysis)

ABC analysis is the technique used to prioritize inventory. Some product needs more attention than others. In this technique one is required to separate products that require a lot of attention from that do not, the product can be classified in the following groups

A-for high value products with low frequency of sales

B-for moderate value products with moderate frequency of sales

C-for low value products with high frequency of sales

Items in class-A require tight inventory control measures because their financial impacts is very high but sales are predictable by contrast items in class- C require

minimum attention because they have small financial impact and their constant sold out. Items in class -B falls somewhere in between class –A and class-C (Campbell, 2017).

Just in time (JIT)

This is technique employed by an organization (especial manufacturing entities) to increase the efficiency of their production at the same time decrease wastage of resources (and so are costs) by receiving products only when there are needed in production process. In other words the manufacturing entities do not have any stock at all (Mckinney, 2017)

VED analysis

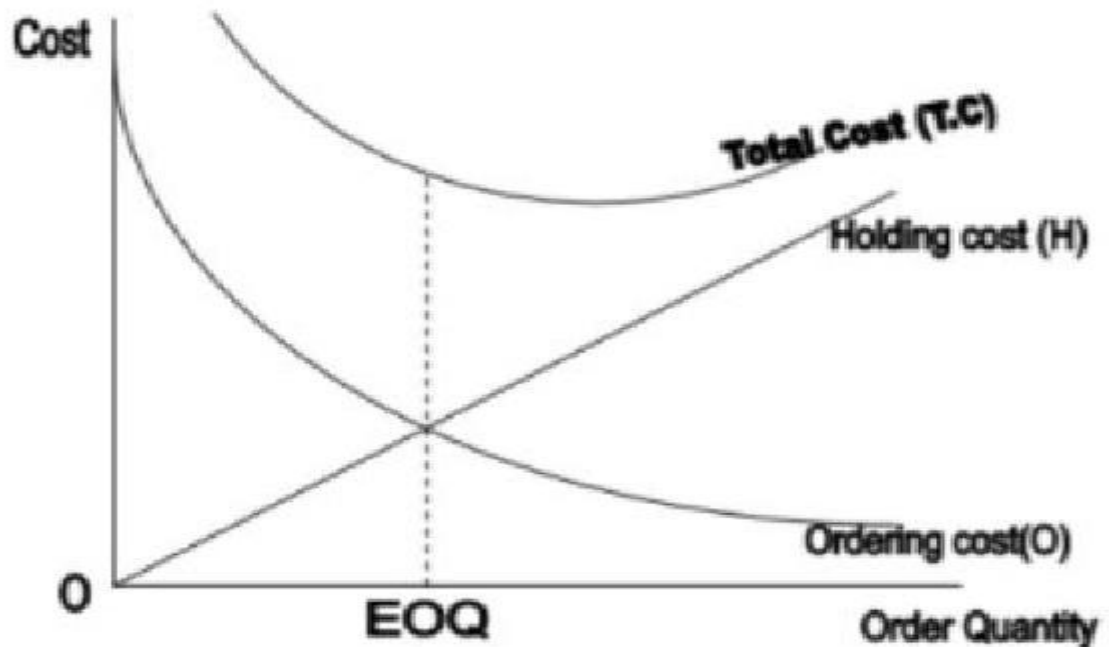
This technique is solely based on criticality of inventories for example in hospitals or pharmacies there are medicine which are critically needed for survivor of patients and must be available at all time. VED techniques divide inventory in to three categories; desirable items, vital items and essential items

Vital commodities are inventory which a business cannot run without; essential items are the inventory which improve quality, and speeds of production; desired items are the inventory which then are unavailability will not affect production or function of the business (Pagare et al. 2016)

Economic order quantity (EOQ)

Economic order quantity is the technique that minimizes the total inventory holding and ordering costs. In this technique; one determines the optimal number of inventory so that he/she minimize the total costs associated with purchases, delivery and storage of inventory(Boundless). It is a mathematical technique to the requesting of inventories, where the consolidated expenses of requesting and holding stock are kept to least. It is the best method for establishing optimum inventory levels as the graph below illustrates;

Figure 2.1 Optimum Inventory level



The right inventory levels (EOQ), occurs where the holding graph and ordering graph meets. At this point ordering cost equals the holding cost (Pasandideh et al. 2011).

2.2 Theoretical argument

This study was located within the content of inventory control theories. This section explores the theories that have been identified as modeling behavior for the problem being tackled by the study and indicating where the study originated. Such theories were Resources based theory and Stock diffusion theory. The theories were selected because they provide a powerful inventory control framework

2.2.1 Resources based theory

Resource based theory state that possession of resources is valuable rare and cannot be replaces. The theory suggest that institutions and organization/or businesses

should look inside the company to find resources that give them the competitive edge through use of their resources.

By having the competitive edge a company can generate sales and/or retain more customers' than their rivals and thus enjoy more profit. The theory stresses that the company competitive edge evolves from the resources that the company has. These resources include tangible resources like facilities, products and equipment and intangible resources like employee skills, customers' loyalty, brand name and reputation (Fredrick 2018). The theory support independent variables (storage system staff competences, and suppliers) by confirming the importance of organization in viewing employees as important competitive resources and how it affects inventory control performance, it should be the company's duty to utilize assets and this principle stipulates how the resources can be used effectively to enhance inventory control.

2.2.2 Stock diffusion theory

A stock diffusion theory was pioneered by Braglia, Gabbrielli and Zammori (2013) with an intention to derive the probability distribution of the stock consumption and that of the reorder time. These authors further explained that the importance of stock diffusion theory is to assess and evaluate the required inventory level in theory and practice. There are three consideration of stock diffusion theory, which are; storage space required, how to avoid expiry of inventory and how coupling inventory is sold or used. These considerations can prevent stock out of inventory, unnecessary expenditure on inventory and overstock.

Moreover stock diffusion theory have been approved to have a direct impact on cost savings a resulting from reduction of storage cost and reduction in the numbers of outdated inventory (Nzuza, 2015).

2.3 Empirical Literature Review

In this section several related studies are reviewed so that the researcher gets to know what others have done on the selected title. This give the researcher a chance to

compare and contrast his study to what others have done and thus giving him or her on how to go about with the study.

2.3.1 Inventory position in Public sectors in Tanzania

Across the country most of the public organizations keep inventory in order to guarantee that services they give to general society are not interfered. However, most struggle to control their inventory due to application of improper or unprofessional inventory control practices.

At Urafiki Mills Company limited, raw materials inventory are still being ordered through visual checks of the stock in the warehouse (Mwansele et al. 2011), which is the case for most of public sectors in Tanzania. This is caused primarily by the disappointment of these public organizations to recognize the criticality of inventory for efficiency of the services they provide.

Improper inventory control is one of the key factors that are contributed to citizens (customers) dissatisfaction for most of the services provided by the public sector, that some are willing to go private or seek quality services abroad.

It is obvious to everyone that, nowadays people are willing or wishes to be attended in private hospitals or attend private schools abroad, because of the poor quality the public sector provides. Poor inventory control is one in every of the tributary factors to the current. To solve this problem public sectors needs to start applying professional inventory control techniques to ensure that inventory is kept at optimum levels to meet customers' demands and at the same time reduce cost burden to the government of keeping inventory(Medard, 2013).

According to Kazare (2009), who researched on viability of the stock control process at St, Augustine college effective inventory control in public sectors in Tanzania can be achieved first on the basis that competent and qualified personnel are installed to supervise all the inventory. The study finds that approximately 80% of the personnel at St. Augustine University are procurement professionals and as a result inventory

control is done in professional way through the use of economic order quantity (EOQ) to control their inventory.

2.3.2 Inventory control performance in Public Health sector

Availability and access to medicines is a key determinant to the performance of a health facility and is often regarded as an important element of quality by health service consumers. Stock out of essential medicines deem the health facility not efficient for service delivery to the community(Osei-Mensah, 2016).

A study on the analysis of performance of medical stocks control system at Dodoma Regional hospital examined on factors affecting service delivery at the hospital. The study found out that there are several reasons that led to poor medical stock control;

Firstly, insufficient involvement of stakeholders in the medicine demands forecasts, the study found out that only 50% of the staff in the pharmacies and laboratories were involved in the demands forecast. This is poor practice in inventory control and can lead to placing wrong orders, place less orders or more order than required. It can also lead to ordering less essential drugs than unessential ones. Thus the hospital can incur cost consequences in storing drugs that are not needed for particular time but also offer poor service due to the fact that they do not have enough essential drugs to meet the demands.

Moreover, the study has revealed that almost 86% of healthcare beneficiaries believe that poor storage of medicines which has resulted to either expiry of drugs or damage of drugs is the reason to underperforming of inventory control. 76% of the beneficiaries also believe that poor management follow up and staff competencies to their roles as being major reasons to stock out of essential drugs in public health facilities (Pallangyo, 2014).

2.3.3 Research Gap

The literature reviewed highlights clearly that; public sectors are running short of efficiency in inventory control. This has contributed to dissatisfaction among the

customers (Citizens) regarding public services in Tanzania. One of the sectors that are notably being complained is the health sector through its public hospitals.

As pointed out earlier, among other reasons, customer (patients) satisfaction and attendance in public hospitals relies on availability of medical stock. Therefore, this study tries to establish and investigate on the factors (determinants) that can improve medical stock control in selected public hospitals in Dar es Salaam with the goal of improving medical services to the public hospitals.

2.4 Conceptual Framework

The outcomes to effective inventory performance are reduction of inventory control costs and better health services provision. Effective inventory control performance happens as a result of variables such as efficient staffs, suppliers and storage systems as displayed in the conceptual model below;

Independent variables

Dependent variable

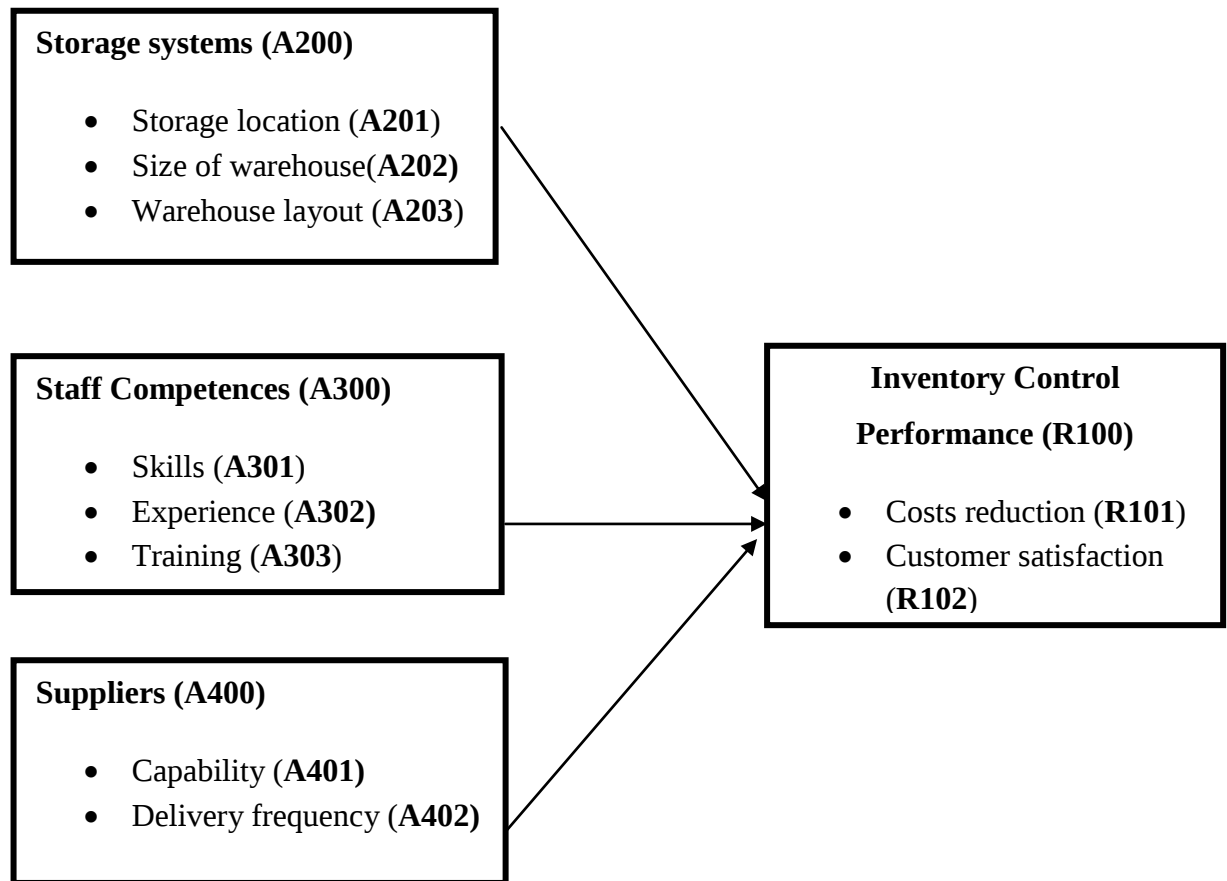


Figure 2.2 Conceptual Framework

Source; Researcher's Construct (2019)

2.4.1Operationalize of variables

2.4.1.1 Medical stock storage systems for hospitals and their influence on inventory control performance;

In inventory management and control storage system mainly involves warehouse management. All activities in the warehouse are aiming of keeping items in good condition for future use, therefore the concept of storage systems is related to warehouse because it refers to the storage all items that are used in daily basis or are intended to be used in the future. Storage is not a static thing but rather a process that includes security measures and maintaining the environment that preserve the integrity and usefulness of the items.

Storage areas ought to be designed to confirm sensible storage conditions. The label ought to specify any special storage conditions needed for the merchandise. Written procedures ought to be offered describing the actions to be taken within the event of temperature excursions outside the labeled storage conditions. All excursions outside the labeled storage conditions should be appropriately investigated and also the disposition of the stock in question should be evidence-based (for example, stability knowledge and technical justification). Stability testing so evaluate the impact of environmental factors on the standard of the drug substance or a developed product that is employed for prediction of its period confirm correct storage conditions and counsel labeling direction (WHO Series No 957, 2010).

Storage area ought to be designed well to make sure acceptable conditions of light, humidity, ventilation, temperature and security. All medicinal products should be keeping in accordance with the manufacturer's directions and inside the terms of product authorizations. Pharmacy stock ought to be keeping beneath appropriate conditions, acceptable to the character and stability of the merchandise involved. Explicit attention ought to be paid to protection from contamination, sunlight, UV rays, moisture, region wetness and extreme temperatures. Throughout storage, medicines ought to be maintained within the manufacturer's original packaging. Sensible storage follow is applicable in all circumstances wherever pharmaceutical product area unit keep throughout distribution process. Pharmaceutical product ought to be packed in a well closed container that protects the contents from contamination by extraneous solids, liquids or vapors and also the loss of the product beneath traditional conditions of handling and storage.

Different pharmaceutical product storage temperature on the basis of stability studies as given below: (WHO Series, No. 957, 2010)

Freezer: an area within which the temperature is maintained thermostatically between -25°C and -10°C (-13°F and -14°F). Cold: Any temperature not prodigious 8°C (46°F) an icebox could be a cold a place within which the temperature is maintained thermostatically between 2°C and 8°C . Cool: Any

temperature between 8° C and 15° C, any pharmaceutical product, that storage in a very cool place directed could, instead, be hold on in a very icebox, unless otherwise per the individual treaties. Smart storage observes is applicable altogether circumstance wherever pharmaceutical product square measure hold on through the distribution process.

According to Kausar (2013), mention Samples of Different pharmaceutical product storage guidelines as given below:

Storage of Tablet: Store in an exceeding cool, shielded from light-weight and wetness. Store in an exceedingly cool and dark place, shielded from light – weight and wetness. Confine a dry dark place store in cool dry and dark place. Storage of Capsule: Store in an exceedingly cool and dry place, shielded from light-weight. Storage of emulsion associate degree emulsion ought to be keep in air tight tool, shielded from light-weight, heat or cooling.

The emulsions area unit needed to be in cool place. Storage of suspension: Suspension ought to be keeping in an exceedingly cool place, however not be unbroken in exceedingly white goods. Cooling at a really temperature ought to be avoided which can result in aggregation of the suspended particles. Storage on label: store in cool and direct sun light –weight. Confine dry place at a temperature not surpassing 30° C. Keep the bottle tightly closed. Store below 25° c, shielded from wetness. Store at temperature not surpassing 30° C, shielded from light-weight.

Storage of injection: Store below 30 °C, protected from light. Store below 25 °C, protected from light. Drugs products that must be stored under defined conditions require appropriate storage instructions. Unless otherwise specified stated deviation may be tolerated only during short term interruptions, Improper storage of insulin decreases the potency and hence the pharmacological action of insulin.

Patients should be educated on the proper methods of storage. Insulin is one such labile drug, sensitive to extreme temperatures and sunlight and hence needs to be stored under refrigeration between 2- 8°C. The uses of the following labeling

instructions are given: On the label Means Do not store over 30 °C from +2 °C to +30 °C Do not store over 25 °C from +2 °C to +25 °C D Do not store over 15 °C from +2 °C to +15 °C Do not store over 8 °C from +2 °C to +8 °C Do not store below 8 °C from +8 °C to +25 °C Protects from moisture no more than 60% relative humidity in normal storage condition. Protect from light to be stored in light resistant container. The pharmaceutical supply chain is becoming increasingly complex, involving a number of storage and transit locations including airports and docks. At all of these points the shipments are often handled by a number of different parties, across multiple geographies which increase the risk to products integrity.

2.4.1.2 Effect of staff competence on inventory control performance

In recent years organizations have become more aware of the importance of human resource. However a lot of them are yet to know how to use and/or develop the potential possessed by their employees as they are not convinced that employee motivation and commitment could have the direct relation to the overall performance of the organization (Rousku, 2014).

Several researchers emphasize that the performance of any organization hinges on the individual competence of their employees (Savanevičienė et al. 2008). Therefore, it is job of the organizations to work on improving work conditions, motivate their employees and develop their skills so as to exploit employee's potential to the maximum. Kolibáčová (2015) urges that staffs performance mainly depends on their motivation, regardless of their skills and knowledge. Moreover knowledge is widely considered as the key factors towards staff competency and other factors like motivation, training, working environment (Rojíček, 2016).

Inventory control is an art that requires knowledge and competency to perform it at maximum efficiency possible. Therefore, the personnel that are responsible for inventory control they are supposed to possess key knowledge, experience and provided with work environment that fit well with inventory control. In terms of knowledge these personnel should process knowledge on materials management (storage, transportation, handling, safety and security), computer skills and

warehouse management. In terms of working environment, the personnel involved in inventory control should be recognized as professionals and thus they should be provided with things like offices (office equipment and tools), and good salaries. This will enhance their overall efficiency and reduce inventory waste (Melanie, 2018). Several research studies conclude that the performance of inventory control is dependent on the staff ability to handle and manage inventories (Rojíček, 2016)

2.4.1.3 Suppliers' influence on performance of inventory control

Inventory control is one of the components of the supply chain. On the other hand, suppliers play an important role in the supply chain; therefore, inventory control and suppliers are aspects that are related.

In today's competitive environment, businesses are recognizing the importance of collaboration between various links in supply chain, one of the important links being suppliers. Suppliers are now assuming a greater role in the business's supply chain, right from product manufacturing to finished goods. Incorporating business activities with those of the suppliers has become imperative for most of businesses given the ever increasing need to avoid under stocking and overstocking (Inventory control) to meet customer's satisfaction (Inderscience, 2007). Moreover, integration of suppliers enhances the ability of the businesses to quickly respond to demand fluctuations. A well arrangement of inventory helps organizations mitigate costs associated with inventory such as cost of holding inventory, the cost of out of stock, and lead time.

According to Tesha (2012), integration is a tool of inventory management which helps to archive effectiveness. In this, organization can meet with a supplier to share information, which will help the supplier to determine the time that the organization will be out of stock. Though, this will improve the performance of the organization through on time delivery of the products.

Also Kunjan (2008), argue on 40 service firm in Kenya discovers that integration of suppliers enhances the ability of organization to quickly respond to demand fluctuations, also helps organization to improves efficiency and minimize over all costs.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter covers research design, Area of study, target population, sample size and sampling technique, data collection as well as data analysis. Research methodology is defined as a way of systematically solve the research problem. It may be understood as a science of studying how research is done scientifically (Kothari, 1990).

3.2 Research design

This research adapted descriptive cross-sectional research design. Descriptive research aims at gathering information without altering or manipulating the context of the subject that is being studied on. It seeks to describe an existing phenomenon by collecting existing data or information with respect to conditions (variables) of the situation. A descriptive cross section study/ research aims at examining and describing factors at a specific point in time for a defined population(Harrison et al. 2017). This study seeks to determine the existing practice in medical stock control on the grounds of storage systems; staff competence and supplier as a result describe the existing inventory control performance in selected public hospitals in Dar es Salaam region.

This study employed a case study approach. Case study is the category in descriptive research that involves a detailed study of a phenomenon. Case studies are inexpensive and that it simplifies complex concepts and this makes data collection easier (Yin, 2003). The researcher employed a case research design for this study due to fact that the study concentrated only on single sector, public hospitals and also due to limited time and resources allocated to the study. Moreover, this approach is flexible and versatile in terms of data collection methods and interpretation.

3.3 Area of the study

The study was conducted in selected public hospitals in Dar es Salaam. The researcher decided to conduct this study in Dar es Salaam because of availability of data and access to entry in these places as it is among the public sector in Tanzania. However, the researcher decided to choose this area because Dar es Salaam has seven major public hospitals which are Muhimbili hospital, Temeke hospital, Ocean road hospital, Tanzania heart institute, Lugalo military hospital, Amana hospital Mwananyamala hospital. But, this research concentrated on only four hospitals which are: Amana, Temeke, Sinza and Mwananyamala as they receive a huge number of patients and it is clear to point out that inventory control had a considerable effect on operations and service delivery of these hospitals. Moreover, these hospitals serve to represent the final performance of the general public health sector in terms of inventory control.

3.4 Target population

Population is defined as a large gathering of people to whom the consequences of the examination are to be comprehensive (Christensen and Johnson 2010). The target population for this study was 198 staffs of public hospitals include: Amana, Temeke, Sinza and Mwananyamala. The study focused on management, PMU, stores department and user department as the unit of investigation of this study because they are engaged direct in inventory issues which were able to contribute reliable information for this study.

3.5 Sample size and sampling techniques

3.5.1 Sample size

A sample size of 50% of population was taken to give a total sample of 99 staffs of selected public hospitals which are: Amana, Temeke, Sinza, and Mwananyamala. Cooper and Schindler (2008) argue that, for any valid and reliable study to be carried, its sample size shouldn't be less than 30% of its population. As it stands, the sample size of this study was 50% of the population because it was easy for the

researcher to handle them and create a sample from them that was not easy for the researcher to cover the entire population of the organization as well as for the researcher to see that the sample was sufficient to suit the study objective as follows:

Given,

The sample size for this study is as follows;

Target population of the study was 198 staffs

Sample size was 50% of population

Hence,

Sample size $50/100 * 198 = 99$ which was equal to sample size of this study.

3.5.2 Sampling techniques

According to Dawson (2007), there are different ways to choose a sample and the method used depends upon the area of study, research methodology and preference of the researcher. There are two types of sampling techniques, which are probability sampling and non-probability sampling. Non probability sampling techniques are sampling techniques where by the selection of the individuals for the sample does not give all the individuals in the population equal chances of being selected while probability sampling techniques give all the individuals in the population equal chances of being selected. In this study, both probability and non-probability sampling was used because the one filled the strength of the weakness of another technique which implied that when the one of them failed the researcher used another to fill the gap.

3.5.2.1 Non probability sampling

For this sampling technique, purposive technique was used by picking individuals from the population based on the authority and knowledge they had concerning the study. A technique was used because there was some information is required for a certain group of people who had the mandatory in making decision on matters

concerning inventory control. These include management, PMU, stores department, and user department which seem they have ability to give required and vital information for this study. So, the sampling technique was used applied judgmental sampling whereby items of the sample were selected deliberately by the researcher who she believes that information would be obtained, and the researcher chose this technique because it is flexible and easy to collect a sample.

3.5.2.2 Probability sampling

A probability sampling technique is one where the likelihood of choosing any component or individual from the whole populace is known. The key to probability sampling is found in the random selection process. An irregular choice uses possibility and chance alone to figure out which individuals or components of the populace are chosen for consideration in the sample (Janet, 2005). Under this technique, simple random sampling was used. A technique was used because the sampling frame is large therefore the technique was ensured a greater representation of a population. As regards to this study and this method, researcher arranged the names of all seven public hospitals and she wrote in a piece of papers separately and folding. The researcher picked only four pieces of papers from them and then included in the sample.

3.6 Type and source of data

3.6.1 Type of data

Data is the information that is in a form that is ready to be processed. In other words, data is referred to information in a raw or unorganized form (Wikipedia, 2016). In some other literatures it is defined as facts, figures and other relevant material past and present saving as basis for study and analysis (Cooper et al. 2006). There are two type of data; Primary data and Secondary data; these study experts to collect both primary and secondary data from a sample selected. Primary data is fresh as it is one that was collected for the first time. In other cases, it was referred to as first hand data. This type of data is usually collected by means of interviews, observation, and questioners. Secondary data is the data which is obtained from literature sources; that

is, it was collected by other researchers for other purposes. In other word, it is second hand information(Saunders et al. 2007).

3.6.2 Data collection method

As highlighted earlier, primary data was expected to be gathered mainly through interviews and questionnaires; while secondary information were gathered through review from documents. These data collection methods are explained here below;

3.6.2.1 Interview

Interview is the conversation where questions are asked and answers are given (Wikipedia 2016). An interview has two personnel, an interviewer and interviewee. An interviewer is the one that ask questions, in this case is a researcher, and an interviewee is the one that responds to the questions posed. In this method the researcher seek to collect raw information direct from the respondent and had a chance to capture emotion or behavioral information. Unstructured interview style has been employed in this study, especially to those who were busy so as to ensure the researcher gets responses from the same set of questions and so that it is easy to compare and analyze responses from different individuals.

3.6.2.2 Questionnaire

Questionnaires are set of formal questions prepared for the purpose of gathering information from respondents. A questionnaire should be well designed to meet research goals and objectives. The researcher should clearly define the population from which she intends to collect data (Abawi, 2013). Questionnaires employed in this study are attached in appendix 1. This is set of questions that were asked and filled when collecting data.

This method is preferred in this study because respondents can be comfortable in giving the required information. Also, it is a good method for keeping responses confidential.

3.6.2.3 Documentary source

The researcher also used this method to get secondary data whereby information was obtained from various documents such as other research report on inventory control, internet surfing, literature books review and journals on inventory control.

3.7 Data analysis

The term analysis alludes to the calculation of specific measures alongside scanning for examples of a relationship that exists among information gatherings. In this manner of analysis, relationship or contrasts supporting or clashing with unique or new hypothesis should be subjected to be exposed to the measurable trial of importance to decide with what legitimacy information can be said to demonstrate any ends (Kothari, 1990). A researcher decided to use both qualitative and quantitative method to analyze data in the study because the study becomes valued to everyone who will read it that meant for those who did not understand to interpret the word in numerical form: they can understand in expression form.

3.7.1 Qualitative analysis

This includes the accurate and logical interpretation of the investigation discoveries. Since the investigation is subjective in nature, information assortment was displayed by utilizing a descriptive approach. The researcher used this approach to all objectives in more elaboration of the findings by using descriptive approach with a support of literatures.

3.7.2 Quantitative analysis

This involves the utilization of statistics particularly the use of percentage, tables and frequency. The researcher applied this technique in simple tables. Also, the researcher used this approach in all objectives in explaining findings through tables, frequency and percentages. On the all objective, the researcher used factor analysis through rotation matrix, and KMO and Bartlett's. The researcher also, analyzed the findings through descriptive statistic which includes frequency and percentage. However, the researcher analyzed the relationship between variables in this study

through simple regression analysis on each hypothesis by using SPSS for quantitative approach.

3.8 Reliability and validity of data

3.8.1 Reliability of data

Reliability is characterized as the nature of the consistency or dependability of a study or estimation. Estimating instrument is solid in the event that it provides consistent results (Kothari, 2004). That means if the same or different researcher repeats the study it should produce more or less the same results. Under this study reliability improved by standardizing the conditions under which the measurement took place, thus a researcher expected to minimize external sources of variation such as monotony and fatigue. Furthermore, the researcher focused on reducing variation in measurement from unit to unit, and asking the same question to sampled individuals. The study covers the reliability information due to the criteria of cronbach's Alpha 0.833 as shown in table 3.1 below.

Table 3.1 Reliability statistics

Cronbach's Alpha	N of Items
.833	40

Sources: Field data 2019.

3.8.2 Validity of data

This is the most critical measure and indicates the degree to which an instrument measures what it is supposed to measure (Kothari, 2004). In order to achieve validity the researcher ensured the measuring instrument provide adequate coverage of the topic by contained adequate representative sample of the selected public hospitals.

3.9 Ethic consideration

During data collection from the respondents, confidentiality was observed so as to obtain in depth information on certain phenomena. Also the respondents were participating voluntarily without any object of cohesions or force. The respondents

were made to understand the reasons of conducting the research, the objectives and the importance of the research hence they were motivated in giving more and accurate information.

CHAPTER FOUR

PRESENTATION OF THE FINDINGS

4.1 introductions

This chapter is premised on presenting the findings of the analysis performed on the data as described in the methodology in Chapter three of this study. This chapter is comprised of three main parts, which are characteristic description of the sample, principal components factor analysis and hypothesis testing. For hypothesis testing, the researcher adopted the use of multiple linear regression analysis where some factors were in fact, confirmed and others were not confirmed to have significant influence on the dependent variable.

4.2 Response Rate

The researcher distributed 198 questionnaires to the respondents. However, not all respondents managed to return the questionnaires provided. Upon follow-up, the total number of duly filled and returned questionnaire was 99. This number implies that 50% of the total distributed questionnaires were returned.

4.3 Characteristics of the Sample

This section provides a descriptive analysis of the sample size. The researcher gathered some aspects of attributes related to the study in order to establish a characteristic distribution of the sample. The aspects covered in this section included years of the respondents, education of the respondents, working experience that the respondents have working in the health sector, and finally, positions that the respondents hold in the health institution they work in.

4.3.1 Age group of the Respondents

The respondents were required to indicate which age group they belonged in, among age group categories which were provided in the survey. After the analysis, the findings revealed that 2% of the respondents were less than 20 years of age, 57.6%

were in the age group of 20-30 years, 25.3% were in the age group of 31-40 years; and 11.1% were in the age group of 41-50 years, finally 4% belonged to the age group of above 50 years.

Table 4.1 Age group of the Respondents

	Frequency	Percent
lesser than 20 years	2	2.0
20 to 30 years	57	57.6
31 to 40 years	25	25.3
41 to 50 years	11	11.1
More than 50 years	4	4.0
Total	99	100.0

Source: Study findings (2019)

4.3.2 Education Level of the Respondents

The respondents were required to indicate their level of education. The survey questions provided multiple categories for the respondents to choose from. After the analysis was done, the findings indicated that 9.1% of them had a high school education, 24.2% had a diploma education, 63.6% had a bachelor degree education and 3% had a masters or higher degrees.

Table 4.2 Education Level of the Respondents

	Frequency	Percent
High school or lesser level of education	9	9.1
Diploma	24	24.2
Bachelor's degree	63	63.6
Master's degree and higher	3	3.0
Total	99	100.0

Source: Study findings (2019)

4.3.3 Experience Working in Health Sector

In this case, the respondents were required to indicate their level of education that they at that time had. The survey results after the analysis was done indicated that 28.3% of the respondents had a less than a year's level of education. 27.3% of the respondents had a work experience of 1-2 years, 25.3% of the respondents had a work experience of 3-5 years, 13.1% of the respondents had a work experience of 6-10 years, and finally 6.1% of the respondents had a work experience of more than 10 years.

Table 4.3 Experience Working in Health Sector

	Frequency	Percent
Less than 1 year	28	28.3
Between 1 and 2 years	27	27.3
Between 3 and 5 years	25	25.3
Between 6 and 10 years	13	13.1
More than 10 years	6	6.1
Total	99	100.0

Source: Study findings (2019)

4.3.4 Position Held at Hospital

The researcher was also interested to understand the administrative distribution of the respondents. The results of the analysis had shown that 17.2% of the respondents were doctors, 18.2% of the respondents were pharmacists, and 37.4% of the respondents were nurses. The results of the analysis also indicated that 19.2% of the respondents were procurement officers, and 8.1% of the respondents were store keepers.

Table 4.4 Position Held at Hospital

	Frequency	Percent
Doctor	17	17.2
Pharmacist	18	18.2
Nurse	37	37.4
Procurement officer	19	19.2
Store keeper	8	8.1
Total	99	100.0

Source: Study findings (2019)

4.4 Factor Analysis

This study had the total of eight (8) dependent variables which were identified as factors that influence inventory control performance. In theory, these factors belonged to a respective larger category, i.e. storage system factors, staff competency factors and supplier's factors. There was a need to therefore test whether this theoretical assumption was in fact correct based on the data collected. In order to do so, factor analysis was therefore performed by using principal components analysis (PCA). Factor analysis was therefore carried out independently. This section therefore demonstrates an entire process of how this was done.

4.4.1 Storage Systems Factors

According to the conceptual framework, storage system factors were storage location, size of the warehouse and warehouse layout. Each of these three factors was comprised of three items which were exposed to principal components analysis. Based on the findings of the factor analysis, it was discovered that Bartlett's test of sphericity was significant at $p < 0.001$, whereas KMO was close to 0.8. Varimax rotation results in factor analysis also revealed that all three items of each component loaded adequately well; hence they were retained for further analysis.

Table 4.5 Rotated Component Matrix^a

	Component		
	Storage location (A201)	Size of warehouse (A202)	Warehouse Layout (A2013)
A201a	.903	.185	.100
A201b	.862	.180	.121
A201c	.742	.319	.145
A202a	.420	.712	.048
A202b	.200	.886	.051
A202c	.135	.895	.152
A203a	.226	-.050	.824
A203b	.403	.087	.762
A203c	-.301	.335	.718

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Source: Study findings (2019)

Table 4.6 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.767
Bartlett's Test of Sphericity	Approx. Chi-Square	442.217
	Df	36
	Sig.	.000

Source: Study findings (2019)

4.4.2 Staff Competencies Factors

According to the framework of this study, staff competencies factors were skills, experience and training. Each of these three factors was comprised of three items which were exposed to principal components analysis (PCA). Based on the findings of the factor analysis, it was discovered that Bartlett's test of sphericity was significant at $p < 0.001$, whereas KMO was close to 0.8 (i.e 0.755). Varimax rotation results in factor analysis also revealed that all three items of each component loaded adequately well except for variable A301a which loaded poorly, the remaining factors were retained for further analysis.

Table 4.7 Rotated Component Matrix^a

	Component		
	Skills (301)	Experience (302)	Training (303)
A301a	.109	.715	-.026
A301b	.830	.258	-.064
A301c	.865	.299	-.001
A302a	.406	.760	-.116
A302b	.402	.781	-.010
A302c	.110	.804	.031
A303a	-.208	.144	.711
A303b	-.022	.003	.789
A303c	.152	-.242	.726

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 4 iterations.

Source: Study findings (2019)

Table 4.8 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.755
Bartlett's Test of Sphericity	Approx. Chi-Square	298.717
	Df	36
	Sig.	.000

Source: Study findings (2019)

4.4.3 Suppliers Factors

Supplier-related factors were supplier capability, and delivery frequencies. Each of these two factors was comprised of three items which were exposed to principal components factor analysis (PCA). Based on the findings of the factor analysis, it was discovered that Bartlett's test of sphericity was significant at $p < 0.001$, whereas KMO was close to 0.556. Varimax rotation results in factor analysis also revealed that all three items of each component loaded adequately well; hence they were retained for further analysis.

Table 4.9 Component Matrix^a

Component		
	Supplier capability (A401)	Supplier delivery frequency (A402)
A401a	.818	.118
A401c	.689	.172
A401b	.364	.295
A402a	.032	.754
A402b	.128	.739
A402c	.018	.790

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Source: Study findings (2019)

Table 4.10 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.556
Bartlett's Test of Sphericity	Approx. Chi-Square	61.258
	Df	15
	Sig.	.000

Source: Study findings (2019)

4.5 Variable Transformation

From the factor analysis performed, all independent factors variables were retained except for the variable “A301a” which did not load adequately in its component. After this was determined, the researched transformed these variables by computing their average, the computation made is demonstrated in the table below.

Table 4.11 Variable Transformation

	Variable label	Computation
Storage systems factors	A201	$(a + b + c) / 3$
	A202	$(a + b + c) / 3$
	A203	$(a + b + c) / 3$
Staff competence factors	A301	$(b + c) / 2$
	A302	$(a + b + c) / 3$
	A303	$(a + b + c) / 3$
Suppliers factors	A401	$(a + b + c) / 3$
	A402	$(a + b + c) / 3$

Source: Study findings (2019)

4.6 Hypothesis Testing

Chapter two of this study presented a conceptual model that identified multiple factors that influence inventory control performance. This chapter carried out a factor analysis which was inclined at understanding whether the suggested factors fairly loaded within their respective constructs. As expected, the results of the factor analysis which was performed loaded very well with the exception of one factor “variable A302a”, which was also excluded from the final variable computations.

In order to carry on with testing the hypotheses, the researcher considered the use of multiple liner regression analysis because the researcher was interested in understanding the degree through which the independent variables (factors) influenced the changes in the dependent variable (inventory control performance).

Therefore multiple regression analysis enabled the researcher to precisely understand the effects of storage system, staff competencies and supplier-related factors on inventory control performance. In order to carry out the analysis, the researcher used the Statistical Package for Social Sciences (SPSS) software version 23.

4.6.1 Storage Systems Factors

4.6.1.1 Storage Location

The focus of the study was to understand the factors that influence inventory control performance. One of those factors was storage location. When the linear multiple regression analysis was performed, between storage location against cost reduction, it was discovered that storage location significantly influenced inventory control performance in terms of cost reduction, where ($\beta = 0.727$, $R^2 = 0.529$ and p-value < 0.05).

It was also discovered that storage location significantly influenced inventory control performance in terms customer satisfaction, with significance levels, ($\beta = 0.692$, $R^2 = 0.479$ and p-value < 0.05). Based on these findings, the researcher accepted beyond doubt the hypothesis that storage location significantly influences inventory control performance as indicated in the table below.

Table 4.12 Coefficients – Storage Location

Dependent Variable	Independent Variables	Beta Coeff	t- values	Sig.	R ²	Interpretation
Cost reduction	Storage location	.727	10.437	.000	.529	S
Customer satisfaction		.692	9.444	.000	.479	S

Source: Study findings (2019)

4.6.1.2 Size of Warehouse

The focus of the study was to understand the factors that influence inventory control performance. One of those factors was size of the warehouse. When the linear multiple regression analysis was performed, between the variable size of the warehouse against cost reduction, it was discovered that size of the warehouse significantly influenced inventory control performance in terms of cost reduction, where ($\beta = 0.483$, $R^2 = 0.234$ and $p\text{-value} < 0.05$).

It was also discovered that size of the warehouse significantly influenced inventory control performance in terms customer satisfaction, with significance levels, ($\beta = 0.498$, $R^2 = 0.248$ and $p\text{-value} < 0.05$). Based on these findings, the researcher accepted beyond doubt the hypothesis that size of location significantly influences inventory control performance as indicated in the table below.

Table 4.13 Coefficients – Size of the Warehouse

Dependent Variable	Independent Variables	Beta Coeff	t- values	Sig.	R ²	Interpretation
Cost reduction	Size of warehouse	.483	5.437	.000	.234	S
Customer satisfaction		.498	5.654	.000	.248	S

Source: Study findings (2019)

4.6.1.3 Warehouse Layout

The focus of the study was to understand the factors that influence inventory control performance. One of those factors was warehouse layout. When the linear multiple

regression analysis was performed, between warehouse layout against cost reduction, it was discovered that warehouse layout significantly influenced inventory control performance in terms of cost reduction, where ($\beta = 0.253$, $R^2 = 0.064$ and $p\text{-value} < 0.05$).

It was also discovered that warehouse layout significantly influenced inventory control performance in terms customer satisfaction, with significance levels, ($\beta = 0.483$, $R^2 = 0.234$ and $p\text{-value} < 0.05$). Based on these findings, the researcher accepted beyond doubt the hypothesis that warehouse layout significantly influences inventory control performance as indicated in the table below.

Table 4.14 Coefficients – Warehouse Layout

Dependent Variable	Independent Variables	Beta Coeff	t-values	Sig.	R ²	Interpretation
Cost reduction	Warehouse Layout	.253	2.578	.011	.064	S
Customer satisfaction		.483	5.437	.000	.234	S

Source: Study findings (2019)

4.6.2 Staff Competencies Factors

4.6.2.1 Skills

The focus of the study was to understand the factors that influence inventory control performance. One of those factors was staff skills. When the linear multiple regression analysis was performed, between staff skills against cost reduction, it was discovered that staff skills significantly influenced inventory control performance in terms of cost reduction, where($\beta = 0.623$, $R^2 = 0.389$ and $p\text{-value} < 0.05$).

It was also discovered that storage location significantly influenced inventory control performance in terms customer satisfaction, with significance levels, ($\beta = 0.638$, $R^2 = 0.407$ and $p\text{-value} < 0.05$). Based on these findings, the researcher accepted beyond doubt the hypothesis that staff skills significantly influences inventory control performance as indicated in the table below.

Table 4.15 Coefficients – Skills

Dependent Variable	Independent Variables	Beta Coeff	t-values	Sig.	R ²	Interpretation
Cost reduction	Skills	.623	7.851	.000	.389	S
Customer satisfaction		.638	8.159	.000	.407	S

Source: Study findings (2019)

4.6.2.2 Experience

The focus of the study was to understand the factors that influence inventory control performance. One of those factors was staff experience. When the linear multiple regression analysis was performed, between staff experience against cost reduction, it was discovered that staff experience significantly influenced inventory control performance in terms of cost reduction, where ($\beta = 0.749$, $R^2 = 0.561$ and $p\text{-value} < 0.05$).

It was also discovered that staff experience significantly influenced inventory control performance in terms customer satisfaction, with significance levels, ($\beta = 0.8972$, $R^2 = 0.804$ and $p\text{-value} < 0.05$). Based on these findings, the researcher accepted beyond doubt the hypothesis that staff experience significantly influences inventory control performance as indicated in the table below.

Table 4.16 Coefficients – Experience

Dependent Variable	Independent Variables	Beta Coeff	t-values	Sig.	R ²	Interpretation
Cost reduction	Experience	.749	11.133	.000	.561	S
Customer satisfaction		.897	19.937	.000	.804	S

Source: Study findings (2019)

4.6.2.3 Training

The focus of the study was to understand the factors that influence inventory control performance. One of those factors was staff training. When the linear multiple

regression analysis was performed, between staff training against cost reduction, it was discovered that staff training did not significantly influenced inventory control performance in terms of cost reduction, where ($\beta = 0.149$, $R^2 = 0.022$ and $p\text{-value} > 0.05$).

It was also discovered that staff training did not significantly influenced inventory control performance in terms customer satisfaction, with significance levels, ($\beta = 0.583$, $R^2 = 0.004$ and $p\text{-value} > 0.05$). Based on these findings, the researcher accepted beyond doubt the hypothesis that staff training significantly influences inventory control performance as indicated in the table below.

Table 4.17 Coefficients – Training

Dependent Variable	Independent Variables	Beta Coeff	t-values	Sig.	R ²	Interpretation
Cost reduction	Training	-.149	-1.465	.146	.022	NS
Customer satisfaction		-.060	-.583	.561	.004	NS

Source: Study findings (2019)

4.6.3 Supplier Factors

4.6.3.1 Capability

The focus of the study was to understand the factors that influence inventory control performance. One of those factors was supplier capability. When the linear multiple regression analysis was performed, between supplier capability against cost reduction, it was discovered that supplier capability did not significantly influenced inventory control performance in terms of cost reduction, where ($\beta = 0.077$, $R^2 = 0.006$ and $p\text{-value} > 0.05$).

It was also discovered that supplier capability did not significantly influenced inventory control performance in terms customer satisfaction, with significance levels, ($\beta = 0.146$, $R^2 = 0.021$ and $p\text{-value} > 0.05$). Based on these findings, the

researcher accepted beyond doubt the hypothesis that supplier capability significantly influences inventory control performance as indicated in the table below.

Table 4.18 Coefficients – Capability

Dependent Variable	Independent Variables	Beta Coeff	t-values	Sig.	R ²	Interpretation
Cost reduction	Capability	-.077	-.753	.453	.006	NS
Customer satisfaction		-.146	-1.442	.153	.021	NS

Source: Study findings (2019)

4.6.3.2 Delivery Frequency

The focus of the study was to understand the factors that influence inventory control performance. One of those factors was delivery frequency. When the linear multiple regression analysis was performed, between delivery frequency against cost reduction, it was discovered that delivery frequency did not significantly influenced inventory control performance in terms of cost reduction, where ($\beta = 0.005$, $R^2 = 0.00$ and $p\text{-value} > 0.05$). It was also discovered that delivery frequency did not significantly influenced inventory control performance in terms customer satisfaction, with significance levels, ($\beta = 0.064$, $R^2 = 0.004$ and $p\text{-value} > 0.05$). Based on these findings, the researcher accepted beyond doubt the hypothesis that delivery frequency significantly influences inventory control performance as indicated in the table below.

Table 4.19 Coefficients – Delivery Frequency

Dependent Variable	Independent Variables	Beta Coeff	t-values	Sig.	R ²	Interpretation
Cost reduction	Delivery frequency	.005	.049	.961	.000	NS
Customer satisfaction		-.064	-.621	.536	.004	NS

Source: Study findings (2019)

4.7 Summary of Tested Hypotheses – Cost Reduction

This section provides brief summary of all independent variables making up storage systems factors, staff competency factors and supplier-related factors; which were regressed with the dependent variable Cost reduction. As it can be seen in the table below, five hypotheses were accepted, whereas three hypotheses were not accepted.

Table 4.20 Tested Hypotheses – Cost Reduction

Dependent variable	Hypothesis	Independent variable	Significance.	Conclusion.
Cost reduction	H1	Storage location	Significance	Accepted
	H2	Size of the warehouse	Significance	Accepted
	H3	Warehouse layout	Significance	Accepted
	H4	Skills	Significance	Accepted
	H5	Experience	Significance	Accepted
	H6	Training	Insignificance	Rejected
	H7	Capability	Insignificance	Rejected
	H8	Delivery frequency	Insignificance	Rejected

Source: Study findings (2019)

4.8 Summary of Tested Hypotheses – Customer Satisfaction

This section provides brief summary of all independent variables making up storage systems factors, staff competency factors and supplier-related factors; which were regressed with the dependent variable Customer reduction. As it can be seen in the table below, five hypotheses were accepted, whereas three hypotheses were not accepted.

Table.4.21 Tested Hypotheses – Customer Satisfaction

Dependent variable	Hypothesis	Independent variable	Significance.	Conclusion.
Customer satisfaction	H1	Storage location	Significance	Accepted
	H2	Size of the warehouse	Insignificance	Accepted
	H3	Warehouse layout	Significance	Accepted
	H4	Skills	significance	Accepted
	H5	Experience	significance	Accepted
	H6	Training	Insignificance	Rejected
	H7	Capability	Insignificance	Rejected
	H8	Delivery frequency	Insignificance	Rejected

Source: Study findings (2019)

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.0 Introduction

In this chapter findings from the study were discussed. The main objective of this study was to assess the determinants towards inventory control in public health hospitals in Tanzania and specific objective of the study were;

- i. To examine medical stock storage systems for hospitals and their influence on inventory control performance.
- ii. To assess the effect of staff competence on inventory control performance.
- iii. To establish the suppliers' influence on performance of inventory control

From the study findings medical stock storage system, staff competence and supplier influence were discussed.

5.1 Medical stock storage systems for hospitals and their influence on inventory control performance

A better medical stock storage system for hospital influence inventory control performance. After conducting the analysis it was found that, Storage location, Size of warehouse as well as warehouse layout have tested to be reliable and valid to the explanation of the medical stock storage system and their influence inventory control performance

5.1.1 Storage Location

The intention of the study was to understand the factors that influence inventory control performance. One of those factors was storage location. After linear multiple regression analysis was conducted, between storage locations against cost reduction, the researcher found that, storage location has a significant influence on inventory control performance in terms of cost reduction (see Table 4.12). The finding shows that proper storage location ensures timely deliveries hence keep track on their inventory level as low as possible at minimum cost. This concurs with the findings of

Seungjae et al. (2015) that one vital area determining the efficiency of warehouse is the determination of the proper storage locations for potentially thousands of products in a warehouse. It is efficient to allocate warehouse in a good area to ensure increase in productivity and reduce the operation cost of the warehouse.

However, the researcher observed that at Mwananyamala, Temeke, Amana and Sinza hospitals, the access to the warehouses are not properly controlled and thus giving freedom for other non-technical staff to access the warehouses. This has resulted to misuse of the warehouse, theft and improper organization and storage of medical inventory.

5.1.2 Size of Warehouse

The aim of this study was to understand the factors that influence inventory control performance. One of those factors was size of the warehouse, linear multiple regression analysis was performed between the variable sizes of the warehouse and cost reduction. The study discovered that size of the warehouse significantly influences inventory control performance in terms of cost reduction, moreover, the study found a correlation between customer satisfactions and the size of the warehouse (see Table 4.12). These findings align well with those of Ezekiel et al. (2012) who assert that the availability of drugs in health facilities contribute 68% of customer satisfaction and the ability the facility to perform efficiently.

The researcher observed a lack of storage space at Mwananyamala, Temeke, Amana and Sinza hospitals where some pharmaceuticals e.g. syringes, potassium kits, vacounteners and testestoran were stored on the floor. Moreover, these hospitals do not have a separate arranged place for keeping expired pharmaceuticals and so the tendency is to store (both expired and unexpired) in the same storage space. The result is, expired pharmaceuticals occupied more space and consequentially increased storage costs (WHO Report, 2003).

Lack of space in the warehouses of these hospitals has led to unnecessary stock out due to lack of space to stock-in new pharmaceuticals. This has increased customers' dissatisfaction of the services provided by these hospitals such as delay in surgery,

lack of medicines in hospital's pharmacies and in extreme situation the death of patients (de Vries, 2011).

5.1.3 Warehouse Layout

The aim of this study was to understand the factors that influence inventory control performance. One of those factors was warehouse layout, linear multiple regression analysis was performed between warehouse layout and cost reduction. The results showed that warehouse layout significantly affected inventory control performance in terms of cost reduction. Moreover, it discovered that warehouse layout significantly influenced inventory control performance in terms customer satisfaction (see Table 4.13).

Therefore, having a good warehouse layout can enable the hospital to monitor its inventory level at minimum cost. Ali, (2011) agree that good warehouse layout ensure that, organization have an up to date inventory count at all times, give good service to their customers , give accurate information to their customers and improve image of the organization.

However, the researcher observes that warehouse layout is not satisfactory at Mwananyamala, Temeke, Amana and Sinza hospitals. The warehouse layout is in such a manner that it does not provide sufficient clear space between furniture, fixtures and fittings so that workers can move about freely without strain or injury and also evacuate quickly in case of an emergency. Also, researcher observed that storage of some medicine direct to the dispensing rooms due to the lack of enough storage area in the main drug stores.

5.2 Effect of staff competence on inventory control performance

Through the analysis, the researcher found that most of respondents agreed that the staff competence influence inventory control in public hospital. The researcher observed that some of the factor that impact staff competence included: Skills, experience, and training.

In this study through the opened-question and that one asked to the 30 interviewees as part of sample individual of this study, the researcher found out as follows:

The researcher found that providing training and development of staffs help to improve competence of staff in handling inventory reduce the loss of inventory stock and keeps the staffs aware and updated of the new inventory control systems.

Respondents suggested that, lack of training and development of staff that are responsible for inventory control results to lack of skills and staffs become outdated in terms of new inventory control systems.

Moreover, from findings that researcher got through interview tool, the respondents elucidated that training and development to the organization especially in inventory, warehouses and stores are important for the daily activities like receiving, dispatching and storage. So, absence of training will affect the inventory control. Others suggested that training for incoming employees and development for existing employees are important to any organization especially in inventory control, if it is not considered it may lead to improper use of procedures, policies and rules that govern inventory.

Moreover, training and experience of staffs is very important because it help them to improve their management skills on inventory control which may reduce the risk of loss of inventory or stocks. Training and development is important to all staffs for development of their own professional skills and organization to achieve its goals.

Most of respondents argued that inexperienced staffs led to improper inventory control operations. On another case, some respondents argued that, inventory control in public sector involves a lot of procedure, policies and rules so, inexperienced staffs may fail to comply with inventory procedure and cause inventory not operate well. However, the researcher revealed that responses from the questionnaire and interview guide tool provided the same responses which proved that the study was a meaningful and fit the purpose. Moreover, these findings concurred with some literatures who did research of the same nature, including Kaimenyi, who did research on factors influencing inventory control in organization at Uchumi

Supermarket in March, 2016. He argued that, qualified, competent and skilled staff will help the organization to achieve its goals and objectives by being efficient and effective when carrying out their various activities. For an organization to succeed, qualification is therefore a pre-requisite and must be matched with job requirement, hence the need to hire and develop ambitious personnel.

Stock control is no longer considered a clerical job to be assigned to untrained individuals within a governmental agency (National Institute of Governmental Purchasing, 2001). If staffs involved in stock control are not qualified and competent, then there will be ineffectiveness in inventory control.

Bailey and Farmer, (2002) argue that for Stock control function to achieve a superior performance, it's necessary to recruit, train and develop personnel with the capacity and motivation to do better job. Carter and Price, (2003) indicate that training of staff is vital if full use is to be made of their abilities and talents. Coe, (2009) says that it's important to ensure that sufficient number of staff and of the appropriate caliber is available to the organization in pursuit of its objectives. Incompetent employees can render stock control virtually ineffective. This finding also agrees with Jessop and Morrison, (1994) finding, who suggested that well trained personnel, should be employed in the organization to help in proper stock recording system.

Another literature Ng'ang'a, (2013) in his study entitled factors influence effectiveness of inventory control in Kenya, he revealed that post employment training was not a common means for preparing staff before deployment to inventory control sections. The findings showed that it's only a few percentage of staff involved in inventory control function who have undertaken post-employment training in different aspects of inventory control and when it happens significant number of these trainings does not lead to formal certification despite being reported to be very essential in ensuring efficient and effective performance which is still used as evident to this study on how the training and development affect inventory control.

Research by Lindsey (2013) indicated that inexperienced staff may find it hard to transform theories into practice as well as to use a new technology to facilitate planning programs. Subashini, (2010) confirms that most of the municipalities from 24 developing countries, like South Africa, are experiencing a problem of having less experienced staff. This includes the appointment of inexperienced individuals by the municipalities to handle the resources of the community (Challenges in smaller municipalities, 2013). Mjema, (2009) did his research at Arusha Municipal argues that,“ the means of achieving an effective inventory control in an Organization, depend on different factors like, goals/objectives, size of the business, type of staff held; such as highly skilled or semi-skilled or common men and the experienced staff the business have. On the same note, Moreland et al. (2006) reveal that relevant work experience plays an integral part in developing professional conduct on inventory control. Work experience constitutes certain competencies which can never be obtained without professional training.

5.3 Suppliers’ influence on performance of inventory control

In the study findings of previous chapter, the analysis showed suppliers influence inventory control performance. In this part, the researcher discussed supplier attribute namely: Supplier capability and delivery frequency.

5.3.1 Supplier Capability

The aim of this study was to understand the factors that influence inventory control performance. One of those factors was supplier capability. Linear multiple regression analysis was performed between supplier capabilities and cost reduction and it was discovered that supplier capability did not significantly influenced inventory control performance in terms of cost reduction. Also, it was discovered that supplier capability did not significantly influenced inventory control performance in terms customer satisfaction. The conclusion is surprisingly unlike other findings such as Zinn et al., (2002) who found a significant relationship between supplier capabilities and cost reduction where by capable supplier enable when demand is low, also, capable suppliers ensure timely flow of materials to customer which leads to

customer satisfaction. Also Proctor and Miller, (2005) report that supplier capability of inventory management in hospital allowed employees to specialize in core competencies.

Therefore pharmacy management team should focus on developing effective strategies to obtain capable supplier in order to maximize leverage of drug and human resource cost (Anil et al.2012). Capable supplier guarantee consistence delivery of drugs, ensure managing inventory which help to meet customers demand at the lowest possible cost and with a minimum investment.

5.3.2 Delivery Frequency

The aim of this study was to understand the factors that influence inventory control performance; one of those factors was delivery frequency. Linear multiple regression analysis was performed between delivery frequencies against cost reduction and it was discovered that delivery frequency did not significantly influence inventory control performance in terms of cost reduction, also it was discovered that delivery frequency did not significantly influence inventory control performance in terms customer satisfaction. This result concurs well with the Steinbeck and Kuhn, (2014) who state that, a high delivery frequency corresponds to a rise of the transportation price, due to several visits taken by the trucks or ships.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATION

6.1 Introduction

This chapter explains the conclusion derived from the research problem, research objectives and research questions. Also this chapter also gives recommendations on what should be done so as to benefit more from inventory control and a suggestion on future studies.

6.2 Summary

The general objective of the study was to assess the determinants towards inventory control in public health hospitals in Tanzania. Specific research objectives were; to examine medical stock storage systems for hospitals and their influence on inventory control performance, to assess the effect of staff competence on inventory control performance, and to establish the suppliers' influence on performance of inventory control. The study applied a case study design whereby selected public hospitals in Dar es Salaam region were involved. The study involved a sample of 99 respondents. The researcher used simple random sampling and purposively in selecting sample. In this study, a purposive sampling technique was used to select respondents as sample size from management and pharmacist from each hospital to formulate sample size. Simple random sampling was used to select 99 respondents whereby those had been sampled from selected public hospitals of the study area. As regards to this study and this method, researcher arranged the names of seven public hospital and she wrote in a piece of paper separately and folding. After the arrangement and folding in a piece of papers, the researcher picked only four pieces of paper from them included in the sample. Data collection tools were questionnaire, interview and documentation. The Statistical Package for Social Science (SPSS) was applied to analyze data.

6.3 Conclusion

This study serves to assess the determinants towards inventory control in public health hospitals in Tanzania. The researcher comes up with conclusion regarding to her objectives as follows:

6.3.1 Medical stock storage systems on inventory control performance

In conclusion, it was found out that the medical stock storage system for hospital and their influence on inventory control performance were storage location, size of the warehouse and warehouse layout. From analysis, it was discovered that storage location significantly influenced inventory control performance in terms of cost reduction, and it was also discovered that storage location significantly influenced inventory control performance in terms customer satisfaction. Based on these findings, the researcher accepts beyond doubt that, the hypothesis that storage location significantly influences inventory control performance is true.

When the linear multiple regression analysis was performed between the variable size of the warehouse against cost reduction, it was discovered that size of the warehouse significantly influenced inventory control performance in terms of cost reduction, and it was also discovered that size of the warehouse significantly influenced inventory control performance in terms customer satisfaction. Therefore, the researcher accepted beyond doubt the hypothesis that size of location significantly influences inventory control performance.

When the linear multiple regression analysis was performed, between warehouse layout against cost reduction, it was discovered that warehouse layout significantly influenced inventory control performance, and it was also discovered that warehouse layout significantly influenced inventory control performance in terms customer satisfaction. However, the researcher accepts beyond doubt the hypothesis that warehouse layout significantly influences inventory control performance.

6.3.2 Staff competence on inventory control performance

In conclusion, it was found out that, staff competence on inventory control performance was influenced by skills, experience and training. When linear multiple regression analysis was performed between staff skills against cost reduction, it was discovered that staff skills significantly influenced inventory control performance, based on these findings, the researcher accepts beyond doubt the hypothesis that staff skills significantly influence inventory control performance.

When the linear multiple regression analysis was performed, between staff experience against cost reduction, it was discovered that staff experience significantly influenced inventory control performance, and it was also discovered that staff experience significantly influenced inventory control performance in terms customer satisfaction. Therefore, based on these findings, the researcher accepts beyond doubt the hypothesis that staff experience significantly influences inventory control performance.

When the linear multiple regression analysis was performed, between staff training against cost reduction, it was discovered that staff training did not significantly influenced inventory control performance, and it was also discovered that staff training did not significantly influence inventory control performance in term of customer satisfaction. Hence the hypothesis was rejected.

6.3.3 Supplier on inventory control performance

In conclusion, it was found out that the effect of supplier on inventory control performance is influenced by capability, and delivery frequency. From analysis, it was discovered that supplier capability did not significantly influenced inventory control performance, and it was also discovered that supplier capability did not significantly influenced inventory control performance in terms customer satisfaction. Based on these findings, the researcher rejects the hypothesis.

When the linear multiple regression analysis was performed, between delivery frequencies against cost reduction, it was discovered that delivery frequency did not

significantly influence inventory control performance in terms of cost reduction, and it was also discovered that delivery frequency did not significantly influenced inventory control performance in terms customer satisfaction. Based on these findings, the researcher rejects the hypothesis.

6.4 Recommendation

The recommendations are formulated basing on research findings in the previous sections of the study and on literature review. The following recommendations were made by the researcher;

Public hospital management should ensure that they have competent staff and trained in-house staff so as to increase their efficiency. It is crucial to have competent staff who can easily attend to the systems in case of errors or malfunctions. This will ensure that the operations run smoothly, the customers are timely served and the systems are not rendered useless.

The layout of work areas should be redesigned to provide sufficient clear space between furniture, fixtures and fittings so that workers can move about freely without strain or injury and also evacuate quickly in case of an emergency. Space for aisles, passages and access to other areas is needed in addition to the space around drug stores.

The public hospitals and other organization should take an action to improve communication and information system to assist in monitoring of inventory especially between vendors and public hospitals.

Organizations should allow their employees to attend training provided by PSPTB so as to improves their staff professionalism and hence obtain value for money.

6.5 Future Studies

This study was conducted to analyze the determinants towards inventory control performance in public hospitals in Tanzania. In this study, the researcher focused on factors that include medical stock storage system, staff competence, and supplier's

factor. A future study can be conducted focusing on each factor's effect on inventory control performance in public hospitals. Furthermore, as a result of limit time and funding, the researcher focused on selected public hospitals located in Dar es Salaam region hence is an opportunity for other researchers to perform this analysis on public hospitals in the rest of regions in Tanzania.

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APPENDIX 1; QUESTIONNAIRE

Researcher name; Judith Shadrack

Contacts; 0744812659/0714011291

Shadrackjudith17@mustudent.ac.tz

Dear respondent,

I am Judith Shadrack, a student from Mzumbe University pursuing Master degree in Procurement and supply chain management (Msc.PSCM).

This questionnaire serves to assess on the determinants towards inventory control performance for public hospitals in Tanzania, case study of selected public hospitals in Dar es Salaam region (Mwananyamala, Temeke, Sinza and Amana). Basing on honest and trustworthy responses that shall be obtained through this questionnaire, I hope to come up with thorough conclusion and recommendations on inventory control performance for Public hospitals in Tanzania.

Please note that all the responses given in this questionnaire will be kept confident and therefore you're requested to be as honest as possible

Appendix A: Questionnaires

Section A: General information (A100)

Please (✓) on the correct answer

A101: What is your gender?

Male

Female

A102: What Age group do you belong?

Lesser than 20 years

20 to 30 years

31 to 40 years

41 to 50 years

More than 50 years

A103: What your level of education?

High school or lesser level of education

Diploma

Bachelor's degree

Master's degree and higher

A104: For how long you have worked in your present hospital?

Less than 1 year

Between 1 and 2 years

Between 3 and 5 years

Between 6 and 10 years

More than 10 year

A105: What position are you holding at the hospital?

Doctor

Pharmacist

Nurse

Procurement officer

Store keeper

Others (specify).....

Section B: Specific Objectives

A200: Storage systems

(Please circle the number on the scale against each of the following statements)

(1) Strongly agree (2) Agree (3) Neutral (4) Disagree (5) Strongly disagree

A201	Storage location					
A201a	Access to warehouse is restricted to authorized staff only.	1	2	3	4	5
A201b	Warehouse is located in area with effective transport, communication lines	1	2	3	4	5
A201c	We use a shared warehouse with other health facilities	1	2	3	4	5

A201d	It is easy to control stock when the warehouse is near the hospital	1	2	3	4	5
A201e	Our warehouse is located in a secure environment	1	2	3	4	5
A202	Size of warehouse					
A202a	Our warehouse is enough to accommodate all our medical inventory	1	2	3	4	5
A202b	The bigger the warehouse the lower the chance of experiencing stock outs	1	2	3	4	5
A202c	There is a need to increase the size of the warehouse/store	1	2	3	4	5
A202d	We do not need drugs warehouse at all	1	2	3	4	5
A202e	Our warehouse has enough space available for loading, unloading of stock	1	2	3	4	5
A203	Warehouse layout					
A203a	There is a need to improve our warehouse layout	1	2	3	4	5
A203b	Proper warehouse layout makes control of drugs inventory easier	1	2	3	4	5
A203c	Our warehouse layout is Un-optimized	1	2	3	4	5
A203d	Our warehouse has designed racking system for storage of drugs	1	2	3	4	5

A203e	We have an established system that organizes drugs in a defined order that makes control easier	1	2	3	4	5
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A300: Staff Competence

(Please circle the number on the scale against each of the following statements)

(1)Strongly agree (2) Agree (3) Neutral (4) Disagree (5) strongly disagree

A301	Skills					
A301a	Qualified staff helps to minimize cost of inventory control	1	2	3	4	5
A301b	Knowledge of inventory control is inevitable for store staff	1	2	3	4	5
A301c	Store staff should possess organizational, communication and Problem-solving skills	1	2	3	4	5
A301d	Store staff should possess computer skills	1	2	3	4	5
A301e	Management staff have knowledge of inventory control	1	2	3	4	5
302	Training					
A302a	Inadequate trained staff in the inventory control section contribute greatly in poor performance of the hospital	1	2	3	4	5
A302b	Our organization has regular meetings,	1	2	3	4	5

	training sessions and conference for knowledge sharing and transfer.					
A302c	Training of staff is vital if full use of their abilities is to be made possible	1	2	3	4	5
A302d	Our warehouse staff regularly undergo a thorough safety training	1	2	3	4	5
A302e	Training is provided as an incentive for increased work performance	1	2	3	4	5
303	Experience					
A303a	As the result of experience, staff make informed inventory control decisions	1	2	3	4	5
A303b	Number of years in services affects performance in inventory control	1	2	3	4	5
A303c	Most of our warehouse staff have more than 3 years working experience	1	2	3	4	5
A303d	Warehouse staff know their working roles	1	2	3	4	5

(Please fill the blank in the following questions)

What techniques do you employ to control your medical stock?

.....

Do you usually keep medical stock to cover for emergency?

.....

...

A400: Suppliers

(Please circle the number on the scale against each of the following statements)

(1) Strongly Agree (2) Agree (3) Neutral (4) Disagree (5) Strongly disagree

A401	Capability					
A401a	We receive our stock from our suppliers without even placing order	1	2	3	4	5
A401b	When we place an order, we receive our stock without delay	1	2	3	4	5
A402c	The supplier(s) always deliver in accordance to our requirements	1	2	3	4	5
A402d	Suppliers are often capable of abiding to delivery schedule (without delays)	1	2	3	4	5
A402e	Our suppliers are financially strong	1	2	3	4	5
A402	Delivery frequency					
A402a	Our suppliers supply a fixed quantity of stock periodically	1	2	3	4	5
A402b	Our suppliers are contacted immediately when there is the need of replenishment	1	2	3	4	5
A402c	We decide when the supplier to deliver stock to our warehouse	1	2	3	4	5

A402d	Our suppliers supply in one trip	1	2	3	4	5
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(Please fill the blank in the following questions)

How many medical stock suppliers do you have?

.....

What do you do when your suppliers fail to meet demands?

.....

What criteria do you use when selecting the medical stock suppliers?

.....

R100: Inventory control performance

(Please indicate the degree to which you agree or disagree with the following statements concerning your inventory control performance)

(1) Strongly agree (2) Agree (3) Neutral (4) Disagree (5) Strongly disagree

R101	Inventory control helps to reduce costs associated with inventory	1	2	3	4	5
R102	Our inventory control ensures high level of customer's satisfaction.	1	2	3	4	5

