EFFECTS OF INVENTORY MANAGEMENT PRACTICES ON SERVICE DELIVERY AT ADULT HOSPITAL-THE CASE STUDY OF UNIVERSITY TEACHING HOSPITAL (UTH)

BY:

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A Dissertation submitted to the Faculty of Business information technology (BIT) of the Cavendish University in partial fulfillment of the requirements for the award of the Degree of Bachelors of Arts in Purchasing and Supply (BPS).

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JUNE, 2020

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DECLARATION

I, CHOOLWE KAILE, do hereby declare that this dissertation is my authentic work, and to the best of my knowledge, information and belief, no similar piece of work has previously been produced at Cavendish University Zambia or any other institution for the award of a Degree’s Bachelor in Purchasing and Supply. All other works in this essay have been duly acknowledged.

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Mr Shadreck Banda
DEDICATION

I dedicate this thesis to my beloved Dad Professor Trevor kaile and my family for their prayers, support, encouragement, love and resources rendered to me throughout my study period in purchasing and supply and during this research.
ACKNOWLEDGEMENTS

Firstly I would want to thank God for being with me throughout this journey, with his undying love and kindness he gave me strength, wisdom and knowledge to undertake this work. Am grateful to him because I was able to complete my work.

Secondly I would like to thank my supervisor for being supportive, understanding and patient in making this research a success. Not forgetting the writers whose work I referenced to and to those who contributed to the success of the work.

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Finally, I wish to thank my family, friends and colleagues for their support and great contribution in the completion of this work.
ABSTRACT

Inventory control is important for any institution. And health institutions are no exception to that fact because without sufficient stock, services to patients will come to a standstill. Inventory Signifies as the largest single investment in assets for most organizations. Health services mostly provide 24 hour services and accordingly, the need to keep stocks of certain medicines and other medical supplies available to do their duties effectively. And from findings it is said that health facilities and delivery of healthcare are affected due to poor stock management. Hence, this study examined the effect of inventory management practices on healthcare delivery using Adult hospital UTH as a case. A sample of 16 staff and 5 patients, was selected for this study. Questionnaires were used as the main tool of data collection. The study revealed that the hospital ensures Agreements with supplier for short cycle deliveries (items which doesn’t take long to deliver), accurate prediction of supplier delivery dates, little or no expediting and Operation of Just-In-time (JIT) purchasing system where no safety stocks are kept. The study also revealed that the hospital ensures Strategic Supplier Partnerships as an Inventory management practice and does not use much of Information Technology in its inventory management practices. The patients were satisfied with the hospital’s reliability of healthcare service (24 hour service and full complement of medical staff), completeness of healthcare service, empathy of healthcare staff and affordability of healthcare service and physical appearance of healthcare service. However, among the challenges the hospital faced with Delays in delivery of drugs leading to insufficient inventories, Use of outdated storage facilities, Use of manual inventory management system/Lack of technology, Bureaucratic process in procurement, Conflict of interest, Weak management system and Insufficient funds for procurement. Hence it was recommended that there is a need for management to emphasize the importance of inventory management and that the hospital should provide a system to keep track of inventory on hand and on order, a reliable forecast of demand that includes an indication of possible forecast error, knowledge of lead time and load time variability, reasonable estimates of inventory holding costs and ordering costs and lastly sufficient funds for procurement.
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ABBREVIATIONS AND ACROYMS

SCM= Supply chain management
UTH= University teaching hospital
SPSS= Statistical package for social sciences
JIT= Just-in-time
VMI= Vendor managed inventory
MRP= Material requirement planning
DRP= Distribution resource planning
EOQ= Economic order Quality
ERP= Enterprise Resource planning
CHAPTER ONE: INTRODUCTION

1.1 Background of the study

With today’s business competition, organisations have to adopt innovative ways of doing business in order to be competitive. Inventory management is important for a business to be successful in their procurement processes, as inventory is one of the most valuable assets to a business, where there is direct link between inventory levels and company profits.

Brigham and Gapenski (2013) argue that inventory management is important because firms will ensure assets and stock are well managed and accurate demand forecasting is maintained to avoid unplanned procurement processes. This will assist the firm in executing successful procurement processes that match demand and supply forces.

Agus and Noor (2010) points out that demand forecasting helps the organization to minimize operational costs, increased efficiency and on time delivery of goods and services. This enables the organization to plan for the future demand by meeting the growing needs of customers. This highly contributes to improved customer satisfaction due to quality of goods and services offered.

Effective inventory practices can improve service delivery by managing customer and vendor relationships is a critical aspect of managing supply chains. In many cases, the collaborative relationship concept has been considered the essence of supply chain management. Bicheno (2011) indicates that a closer examination of supply chain relationships, particularly those involving product flows, reveals that the heart of these relationships is inventory movement and storage. Eckert (2012) argues that much of the activity involved in managing relationships is based on the purchase transfer, or management of inventory.

Inventories are also viewed as a source of near all cash, as the purpose is to achieve efficiencies in areas where costs are involved. Hence there is the need to take measures especially on inventory to deal with Doubts and dynamics on the operational level of the business.

In the healthcare sector, the supply chain can be defined as a complex system that requires the flow of products, and services in order to satisfy the needs of those who serve patients (Schneller and Smeltzer, 2006). Within hospitals, the department responsible for the efficient management
of supplies is often known as material management. Material management functions comprise procurement, distribution, purchasing, and inventory control of supplies with the intention of providing high quality of care at reduced cost.

In the past, healthcare providers were generally focused on providing high quality of care regardless of cost. However, with the skyrocketing cost of materials and the intense competition among healthcare providers, the role of material management has gained great importance for hospitals and healthcare providers.

The healthcare organisation is different from other institutions like others it’s evolved into a highly complex organisation, which brought about an increase in costs in the healthcare sector. This has forced practitioners and academicians to seek ways of solving the problem.

While the costs of healthcare increases, healthcare organisations are required to provide high quality care, this will require the availability of resources are used to provide essentials medications to the ever increasing population. Pharmacy department being the one of the most consumers of the hospital budget and one of the few areas where a large amount of money is spent on buying medicines and drugs. It is therefore important that hospitals ensure smooth supply of the required stock to ensure uninterrupted supply. This calls for the effective and efficient inventory management of pharmacy stock by keeping a close supervision on important drugs, prevention of pilferage, and priority setting in purchase and distribution of drugs.

In summary we find that problems faced by hospitals in relation to stock management are; shortages of items, the holding of excessive stock, large amount of outdated stock and stock losses. Thus the research is aimed at assessing the effect of inventory management practices on healthcare service delivery at adult hospital-the case study of the University Teaching Hospital.

1.2 STATEMENT OF THE PROBLEM

To meet the expectations of the people, one can think of how to control inventory in the Hospitals to ensure availability of medical supplies and to avoid expiry of drugs and misuse of the supplies. The resources are limited and hence the need to find the possible and effective ways of reducing cost of purchase and the cost of holding inventory in health sector.
Public sector in Zambia and across other developing countries mostly leave inventory decision to departments as well as stores management, as a result there are relating problems in terms of high cost of inventory, selection of suppliers, delivery problems, stock obsolescence, stock-out, etc.

Firstly, it’s hard to determine the accurate demand forecast about the patients and their consumption of the drugs. Secondly hospitals tend to hold a large amount of stock due to uncertainty demand; hence they suffer a high operational cost and have to deal with expiry problems. Thirdly, due to strict regulatory requirements medicines can only be selected by physicians on specific patients and reimbursed in whole or in part by third-party insurer or state.

There is no doubt that inventory needs proper control due to it being the largest asset of a business( Singh & Singh 2014) and the balancing of strategy in supply chain, management of inventory and characteristics of the product are highly urgent for the performance operations of an organization (Srinivas, 2013). These issues are in line with the research conducted by (Chalotra 2013) where a greater degree of inventory control is important in hourly basis, as it contributes the organizations performance as the challenge is strong, and daily growth.

Inventory management has now become the major concern of the public sector since inventory is said to be the solid cash of resources being expanded annually without proper accountability. In view of the above, the fundamental question that is addressed by this study is; ‘Does inventory management have an effect on health care delivery’?

1.3 PURPOSE OF THE STUDY

The aim of this study is to determine the effectiveness of inventory management practices on service delivery at UTH. This study will help managers or finances to operate efficiently to meet the supply chain performance and to make sure the patients are receiving good delivery service from the hospital, it also acts as a reference for researchers and it will help the government in the implementation of future plan. Today, healthcare managers and industry experts understand that the efficient management of materials can not only reduce operating cost, but increase the quality of care. While it has been acknowledged that the deployment of better material management practices can represent as much as $23 billion in cost savings (EHCR, 2001), the healthcare sector has seen little improvements in this area. Furthermore, the lack of success in this area can
be attributed, for the most part, to the existence of strong implementation barriers that have hindered the adoption of SCM practices. Thus, there is a strong need to study the challenges embedded in the healthcare sector in order to provide material managers with potential solutions to reduce inefficiencies and achieve supply chain success.

1.4 OBJECTIVES OF THE STUDY

1.4.1 GENERAL OBJECTIVES

To assess the effect of inventory management practices on service delivery at Adult Hospital (UTH)

To improve the management of stocks so that there is no over stocking through the use of led down methodologies.

1.4.2 SPECIFIC OBJECTIVES

1. To examine the inventory management practices of UTH

2. To evaluate the healthcare service delivery level of UTH e.g. E ward.

3. To determine the effect inventory management practices has on the healthcare service Delivery level of the hospital.

4. To determine the challenges with inventory management at UTH

1.5 RESEARCH QUESTION

The following research questions guided the study:

1. What are the inventory management practices at Adult hospital (UTH)?

2. How effective is inventory management to service delivery level at Adult hospital (UTH)?

3. What effect does inventory management practices have on the service delivery level of the Hospital?

4. What are the challenges with inventory management at Adult hospital (UTH)?
1.6 SIGNIFICANCE AND JUSTIFICATION OF THE STUDY

The study hopes to provide sufficient information to Adult hospital (UTH), on better ways of managing their inventory to achieve efficiency in their supply system. Supply chain professionals and finance managers will find this study useful since it will provide information on ways of justifying inventory costs and improving efficiency in the delivery of goods and services.

The findings of this study will be useful to the Ministry of Health since it will shed more light on the inventory management challenges faced by Adult hospital (UTH). This will enable the Ministry of Health to intensify efforts in allocating more resources and facilities to enhance supply chain performance and thus contribute to the achievement of quality health care services.

The study will be important since it will add knowledge in inventory management discipline of procurement and supply chain management. Academicians and scholars will also find this study useful in broadening their knowledge and skills in inventory management.

The benefit of sharing information among researchers is another reason for the study. Thus, the information provided in the study will be useful to researchers who might want to undertake further research into the area of inventory control in the public sector. This study is undertaken to enhance the frontiers of knowledge by adding up to literature on inventory management practices in service industries such as the health sector and its effect on the service that is delivered in the hospital.

Furthermore, the study findings will serve as management policy guide for the Stakeholders in the Health Sector since the study will reveal the state of the hospital’s inventory management practices and how this affects the quality of service delivery to the clients (patients). These policies will help the government policy makers to implement them as a policy in terms of effectiveness and efficiency running of inventory in government stores.

It will help students on the basis on where to refer and it will also act as an ankle for the future prosperity where this study can be acknowledged to have significance in this area.
The reason to justify the study was that after thoroughly research of all written inventory done by other researchers none had written specifically on the topic of inventory on public hospitals. Hence undertaking these tasks to bridge the gap.

1.7 METHODOLOGY

This research is a case study of a service delivering organisation (Adult Hospital-UTH). This was a prospective quantitative and qualitative study in nature, involving collection of primary data through questionnaires administered to patients of the E wards Adult hospital, Sister in charges of the E wards and the heads of the units of the procurement department. Primary data was analysed using the statistical package for social sciences (SPSS). Secondary data was collected from journals, articles and books.

1.8 Outline of the report

The remainder of the report includes literature review with research variables underpinning the study. The other section of the study is research methodology which captures the philosophy, strategy and design, sampling frame, and techniques, and its limitation. Chapter four of the report contains data analysis which involves qualitative data analysis. Chapter five and six contain discussion, and conclusions and recommendations.

1.9 Conclusion

This study provides substantive support for previous findings in the inventory management practices literature and fresh insight about inventory management. This study will investigate the relationship and the ability between inventory management practices towards inventory management performance. Thus, the result of this finding will help an organization in assessing their level of inventory management practices and also will be a guideline on what they need to do in order to outperform their organizational performance by using a proper inventory management practices as a tool. Hopefully this study will be able to fill in the knowledge gap in the area of inventory management, especially the proper technique of inventory management practices in assisting the organizations to outperform their performance and makes them closer towards achieving business excellence.
CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Overview

This chapter reviews relevant literature on inventory and its management in healthcare service delivery. In detail, it captures the meaning of inventory, the inventory management models, inventory management practices, challenges of implementing inventory management practices, the summary of the literature review, the reasons for holding inventory, importance of inventory to an organization, inventory cost, inventory management and inventory management techniques as well as the broad concept of supply chain management.

Inventory management is mostly about specifying the size and placement of stocked goods. Inventory management is required at different locations within a facility or within multiple locations of a supply network to protect the regular and planned course of production against the random disturbance of running out of materials or goods. The scope of inventory management also concerns the fine lines between replenishment lead time, carrying costs of inventory, asset management, inventory forecasting, inventory valuation, inventory visibility, future inventory price forecasting, physical inventory, available physical space for inventory, quality management, replenishment, returns and defective goods and demand forecasting. Balancing these competing requirements leads to optimal inventory levels, which is an on-going process as the business needs shift and react to the wider environment.

An effective and efficient management inventory flow across the value chain is one of the key factors for success of large and small enterprises. The challenge in managing inventory is to balance the trade-off between the supplies of inventory with demand. Ideally a company wants to have enough inventories to satisfy the demands of its customers no lost sales due to inventory stock-outs. On the other hand, the company does not want to have too much inventory staying on hand because of the cost of carrying inventory. Inventory decisions are high risk and high impact for the supply chain management of an organization. According to Dimitrios (2008), inventory management practices have come to be recognized as a vital problem area needing top priority.
Service delivery is a business aspect that defines the interaction between clients and providers where service is offered by the providers, and the clients either loses value or finds value as a result. Good service delivery provides clients with value increase.

2.2. Meaning of Inventory

Inventory is defined as a stock or store of goods (Stock and Lambert, 2001). These goods are maintained on hand at or near a business's location so that the firm may meet demand and fulfill its reason for existence. If the firm is a retail establishment, a customer may look elsewhere to have his or her needs satisfied if the firm does not have the required item in stock when the customer arrives. If the firm is a manufacturer, it must maintain some inventory of raw materials and work-in-process in order to keep the factory running. In addition, it must maintain some supply of finished goods in order to meet demand.

Coyle et al (2003) defines inventory as “raw materials, work-in-progress, finished goods and supplies required for creation of a company’s goods and services”. Davis et al (2003) also defines inventory as “the stock of any item or resource used in an organization”. In a broader context, inventory can include inputs such as financial, energy, human, equipment, and physical items such as raw material; inputs such as parts, components, and finished goods; and interim stages of the process, such as partially finished goods or work-in-progress.

Inventories are the physical resources that a firm holds in stock with the intent of selling it or transforming it into a more valuable state. Inventory represents the largest single investment in assets for most manufacturers, wholesalers and retailers (Stock and Lambert 2001). It is said to be any idle resource held for future use (Dilworth, 1993).

Furthermore according to Stevenson (2010), Inventory Management is defined as a framework employed in firms in controlling its interest in inventory. It includes the recording and observing of stock level, estimating future request, and settling on when and how to arrange (Adeyemi & Salami, 2010). On the other hand, Deveshwar and Dhawal (2013) proposed that inventory management is a method that companies use to organize, store, and replace inventory, to keep an adequate supply of goods at the same time minimizing cost. Choi (2012) indicates that effective inventory management is essential in the operation of any business. Thus, keeping stock is used as an important strategy by companies to meet Customers’ needs without taking the risk of
frequent shortages while maintaining high service level. As Axsäter (2006) describes, inventories make high cost, both in the sense of tied up capital and also operating and administrating the inventory itself. It is argued that time from ordering to delivery of replenishing the inventory, referred to as the lead time, is often long and the demand from customers is almost never completely known according to the writer (Axsäter, 2006). Therefore, managers should consider how to achieve the balance between good customer service and reasonable cost, which is the purpose of inventory management, involving the time and volume of replenishment.

2.3 Elements of Inventory

Inventory is generally made up of three elements such as raw materials, work-in-progress (WIP), and finished goods (Arnold, 2008; Cinnamon, Helweg-Larsen, & Cinnamon, 2010; Gitman, 2009). Raw materials are concerned with the goods that have been delivered by the supplier to purchaser’s warehouse but have not yet been taken into the production area for conversion process (Cinnamon et al., 2010). WIP concerns are when the product has left the raw material storage area, until it is declared for sale and delivery to customers. In this process, the working capital must be considered in terms of reducing the buffer stocks, eliminating the production process, reducing the overall production cycle time. The raw materials and finished goods must be minimized in the production area. WIP must be carefully examined to justify how long it takes for products to be cleared for sale. This stage is normally done by the quality control procedures (Birtet al., 2011; Cinnamon et al., 2010). Finished goods refer to the stock sitting in the warehouse waiting for sale and delivery to customers.

2.4 Types of Inventory

Stock and Lambert (2001) categorized inventories into six main types, namely:

I) **Cycle Stock** is the inventory that results from the replenishment process and is required in order to meet demand under conditions of certainty. That is when the firm can predict demand and replenishment times (lead times) perfectly.

II) **In-Transit Inventory (Pipeline)** is the inventory that is en route from one location to another. It may be considered part of cycle stock even though it is not available for sale and or shipment until after it arrive at the destination.
III) **Safety or Buffer Stock** is the stock held in excess of cycle stock because of uncertainty in demand or lead time. The notion is that a portion of average inventory should be devoted to cover short-range variations in demand and lead time.

IV) **Speculative Stock** is inventory held for reasons other than satisfying current demand. That is inventories purchased as a result of speculations of price hikes.

V) **Seasonal Stock** is a form of speculative stock that involves the accumulative of inventory before a season begins in order to maintain a stable labour force and stable production runs or in the case of agriculture products, inventory accumulated as a result of a growing season that limits availability throughout the year.

VI) **Dead (obsolete) Stock** is the set of items for which no demand has been registered for some specified period of time. They are out of date, deteriorated or no longer useful as a result of advancements in technology.

### 2.5 Inventory Management

Inventory management is the active control program which allows the management of sales, purchases and payments. According to Coyle et al (2003), inventory is a critical factor for success in many companies. Inventory impacts the cost of sales, but it also supports order fulfilment (customer service).

As stated earlier in chapter one, Inventory management is vital for the successful operation of most organizations due to the cost inventory represents. Effective management of inventory is a major concern for firms in all industries (Mentzer, et al., 2007). In order to achieve this, there is therefore the need for firms to effectively and efficiently manage their inventories. There are two main concerns about inventory management. First, inventory management concerns the level of customer service, that is, to have the right goods in sufficient quantities, in the right place and at the right time. Another concern is the cost of ordering and carrying inventories (Stevenson, 2009).
2.6 Inventory Management Techniques

Inventory management relates to the tracking and management of commodities which includes the monitoring of commodities moved into and out of stockroom locations and the reconciling of the inventory balances. Some of the techniques used in managing inventories were discussed below:

2.6.1 ABC Analysis

This technique assigns items to three groups according to the relative impact or values of the items that makes up the group. Those thought to have the greatest impact, or value, for example, constituted the ‘A’ group, while those items thought to have a lesser impact or value were contained in the ‘B’ and ‘C’ groups respectively (Coyle et al., 2003). In many ABC analysis, a common mistake is to think of the ‘B’ and ‘C’ items as being for less important than the ‘A’ items and, subsequently, to focus most or all of management’s attention on the ‘A’ items. A decision might be made to assume very high in-stock levels for the ‘A’ items and little or no availability for the ‘B’ and ‘C’ items. The fallacy here relates to the fact that all items in the A, B and C categories are important to some extent and that strategy to assure availability at an appropriate level of cost. The purpose of this classification is to ensure that purchasing staff use resources to maximum efficiency by concentrating on those items that have the greatest potential savings. Selective control will be more effective than an approach that treats all items identically (Lysons and Gillingham, 2003).

The relevance of this theory to this study is that it suggests that though all categories of inventory is important, inventory must be categorized or classified in accordance to their relative impact or value and treated differently.

2.5.1 Economic Order Quantity (EOQ)

Plasecki (2001) defines Economic Order Quantity as an accounting formula that determines the point at which the combination of order costs and inventory costs are the least. Lysons and Gillingham (2003), also defines Economic Order Quantity as the optimal ordering quantity for an item of stock that minimizes cost. According to Lysons and Gillingham (2003), to calculate the Economic Order Quantity, a mathematical model of reality must be constructed.
All mathematical models make assumptions that simplify reality. The model is valid only when the assumptions are true or nearly true. When an assumption is modified or deleted, a new model must be constructed. Economic Order Quantity approaches have proven to be effective inventory management technique when the demand and lead time are relatively stable, as well as when significant variability and uncertainty exist.

This theory is relevant to this study in that it suggests that the appropriate or optimum level of stock or inventory that an organization should keep or store must help to reduce the cost of doing business.

2.5.2 Material Requirement Planning (MRP I)

Ballou (1999), defined material requirement planning as a mechanical method of supply scheduling where the timing of purchase or of production output is synchronizing to meet period by period operations requirement. Ballou (1999), explained further that material requirement planning methods try to avoid carrying more inventory than is needed at a time. Thus the emphasis is on carrying only the quantities of stock needed at any point in time, and this is achieved through precise timing of material flows to meet requirements. Lysons and Gillingham (2003), defined material requirement planning as a product-oriented computerized technique aimed at minimizing inventory and maintaining delivery schedules. It relates the dependent requirements for the materials and components comprising an end product to time periods known as ‘buckets’ over a planned horizon (typically one year) on the basis of forecasts provided by marketing and sales and other input information. Coyle et al. (2003), explained material requirement planning as a set of logically related procedures, decision rules, and records designed to translate a master production schedule into time-phased net inventory requirements for each component item needed to implement this schedule. Lysons and Gillingham (2003), outlined the aims of material requirement planning as follows:

- To synchronize ordering and delivery of materials and components with production requirements.
- To achieve planned and controlled inventories and ensure that required items are available at the time of usage or not much earlier.
• To promote planning between the purchaser and the supplier to the advantage of each.

• To enable rapid action to be taken to overcome material or component shortage due to emergencies, late delivery and so on.

Coyle et al. (2003) also explained the goals of material requirements planning as follows:

Ensure the availability of materials, components and products for planned production and for customer delivery.

I) Maintain the lowest possible inventory level.

II) Plan manufacturing activities delivery schedule, and purchasing activities.

In doing so, the material requirement planning system considers current and planned quantities of parts and inventory products, as well as the time used for planning.

2.5.3 Manufacturing Resource Planning (MRP II)

Manufacturing resource planning (MRP II), has been defined by the American Production and inventory Control Association as a system built around materials requirement planning and also including the additional planning functions of production planning, master production scheduling and capacity requirement planning.

Lysons and Gillingham (2003), explained that, manufacturing resource planning (MRP II) has wider implications than material requirements planning (MRP I).

Stock and Lambert (2001), also explained that, material requirements planning (MRP I) developed into manufacturing resource planning (MRP II) with the addition of financial, marketing and purchasing components.

According to Coyle et al. (2003), manufacturing resource planning (MRP II) allows a firm to integrate financial planning and operations/logistics. They further explained that manufacturing resource planning (MRP II) serves as an excellent planning tool, and it helps describe the likely results of implementing strategies in areas such as logistics, manufacturing, marketing, and
finance. Thus, it helps a firm to conduct “what if? Analysis and to determine appropriate product movement and storage strategies at and between points in the firm’s logistics system. Both material requirements planning (MRP I) and manufacturing resource planning (MRP II) are relevant to this study in that they place emphasis on carrying quantities of stock that is needed at any point in time and avoid unnecessary stock. This therefore helps reduce holding or carrying cost.

2.5.4 Enterprise Resource Planning (ERP)

Stock and Lambert (2001), explained that Enterprise resource planning (ERP) is a system that includes the core accounting functions of accounts payable, accounts receivable, and general ledger, coupled with logistics functions, to manage the organization.

Lysons and Gillingham (2003), defines Enterprise resource planning (ERP) as a business management system that, supported by multi-module application software integrates all the departments of functions of an enterprise.

Lysons and Gillingham (2003) further explained that Enterprise resource planning (ERP) is the latest and possibly the most significant development of material requirement planning (MRP I) and manufacturing resource planning (MRP II). While MRP I and MRP II allowed manufacturers to track supplies, work in progress and the output of finished goods to meet sales orders, ERP is applicable to all organizations and allows managers from all functions or departments to have a consolidated view of what is, or is not taking place throughout the enterprise.

2.5.5 Distribution Resource Planning (DRP)

Lysons and Gillingham (2003) defined Distribution Resource Planning as an inventory control scheduling technique that applies material requirements planning principles to distribution inventories. It may also be regarded as a method of handling stock replenishment in a multi-echelon environment.
Vollman et al. (1997), observed that Distribution resource Planning (DRP) serves a central role in co-coordinating the flow of goods inside the factory with the system modules that place goods in the hands of the customers, and provides the basis for integrating the manufacturing resource planning (MRP II) system from the firm to the field.

According to Coyle et al. (2003), Distribution resource planning is a widely used and potentially powerful technique for outbound logistics systems to help determine the appropriate level of inventory. They further explained that, DRP helps companies to improve customer service (decrease stock out situations), reduce the overall level of finished goods, and improve distribution centre operations. The underlying rationale for Distribution resource planning (DRP) is to more accurately forecast demand and to explode that information back for use in developing production schedules. In that way, a company can minimize inbound inventory by using material requirements planning (MRP) in conjunction with production schedules. Outbound inventory is minimized through the use of Distribution resource planning (MRP) (Coyle et al, 2003).

The relevance of this theory to this study is that it suggests that inventory quantities are determined by comparing inventory status with the total number of items needed to meet the production schedule.

2.5.6 Just-In-Time System (JIT)

Coyle et al. (2003), defined Just-In-Time (JIT) System as an inventory control system that attempts to reduce inventory levels by coordinating demand and supply by the point where the desired item arrives just in time for use. Ideally, products should arrive exactly when a firm needs it, with no tolerance for late or early deliveries.

Lysons and Gillingham (2003), also defined Just-In-Time System as an inventory control philosophy whose goal is to maintain first enough material in just the right place at just the right time to make just the right amount of product.

It is a lean production system used mainly in repetitive manufacturing. The Just-In-Time System suggests that inventories should be available when an organization needs them, not any earlier, nor any later. Stock and Lambert (2001), defined Just-In-Time System as a program which seeks
to eliminate non-value-added activities from any operation with objectives of producing high-quality products, high productivity levels, lower levels of inventory, and developing long-term relationships with channel members. Stock and Lambert (2001), further explained that in Just in time (JIT) System, anything over the minimum amount necessary for a task is considered wasteful. Thus, Just-In-Time (JIT) attempts to minimize inventories through the elimination of safety stock.

This theory is relevant to this study because it focuses on the identification and elimination of manufacturing system. This therefore helps to eliminate unnecessary inventory and reduce cost throughout the entire supply chain system.

Among the techniques of inventory management discussed above, ABC Analysis seek to categorize all inventory in accordance to relative impact and value, so that the more value placed on an item, the more of that particular item held in stock.

The Economic Order Quantity (EOQ), focuses more on minimizing inventory cost rather than minimizing the inventory itself (Stock and Lambert, 2001).

Material Requirement Planning (MRP I), Manufacturing Resource Planning (MRP II) and Enterprise Resource Planning (ERP) try to manage inventory by avoiding unnecessary inventory, and place more emphasis on only needed stock (Stock and Lambert, 2001). Distribution resource planning (DRP) avoids unnecessary inventory and also compare inventory status with the total number of items needed to meet operational schedule (Stock and Lambert, 2001).

The Just-In-Time (JIT) System ties to eliminate waste by maintaining just enough inventories at the right place at the right time to make just the right amount of product.

All these inventory management techniques discussed above reveals that carrying unnecessary stock of goods and materials adds to the operational cost of the organization and therefore reduces its profitability. Therefore, the solution to reducing overall cost of holding inventory lies with adopting the use of efficient procedures to manage and control physical inventory of goods. Thus, the organization must invest thoroughly in ensuring that the right stock is available when
and where it is needed. This helps to reduce the loss of sales opportunities and thereby improve upon the profitability of the organization (Stock and Lambert, 2001).

2.5.7 Vendor Managed Inventory

Management of inventory determines the way an organization will thrust itself to high performance efficiency. Some organizations have resulted to vendor managed inventory (VMI) systems which aid the supplier to monitor customer’s inventory usage. Through this VMI system, customers will avoid stock outs because the suppliers will have already replenished their inventory. The key aspect here is communication which should be well planned from the beginning of business relations between the customer and the supplier (Frahm, 2003). Vendor managed inventory saves an organization immense time and finance since the supplier will be able to monitor its customer’s levels of inventory and make a point of replenishing them. As the customer and supplier interact, the communication channel needs to be clear and fast so that they may avoid instances of stock outs. Where the customer anticipates having an abnormal levels of order they should notify the supplier so that they can adjust their production to cater for the demand.

Moreover, we now have Joint Managed Inventory which is an advance level of vendor managed inventory. It seeks to integrate the supplier more firmly into the customer’s organization by using the point of sale (POS) which allows the supplier to see the real time data of its customer’s inventory (Frahm, 2003).

2.7 The Role of stock administration on operational performance

There are theories utilized in carrying clarity to the investigation of the role of stock administration on operational performance. The major theories include the theory of Constraints and Lean. Theory to build the critical concerns regarding the impacts of inventory management approaches on the profitability of manufacturing firms.

2.7.1 Theory of constraints

The Theory of Constraints is an administration reasoning that looks to expand manufacturing throughout proficiency evaluated on the bases of recognizable proof of those procedures that are obliging the industrial system. There are various challenges experienced in the application of the.
Theory of Constraints. For instance, there is a long lead time, significant number of unsatisfied requests, irregular state of meaningless inventories or nonexistence of appropriate inventories, wrong materials request, expansive number of crisis requests and endeavor levels, absence of clients engagement, nonattendance of control identified with need orders which suggests on timetable clashes of the assets. The theory focuses on adequately dealing with the limit and ability of these limitations to enhance efficiency and this can be accomplished by manufacturing firms applying fitting inventory control practices. Theory of constraints is an approach whose proposition is connected to generation aimed at achieving a reduction of the organizational inventory (cooper, 2006)

2.7.2 Lean theory

Lean theory is an augmentation of thoughts of JIT. The theory disposes of buffer stock and Minimizes waste in production procedure (Green and Inman 2005). Inventory leanness decidedly influences the productivity of a business firm and is the best inventory control tool. The theory expounds on how manufacturers’ adaptability in their requesting choices diminish the supplies of stock aimed at eliminating costs associated with the transportation of inventory. Feedback presented against the theory insinuates that materials must be available when dealing in long haul cooperation constituting data and information sharing and the exchange of accomplices between firms.

2.8 The Need for Inventory management in Hospitals

Hospitals are complex organisations providing large number of services to patients, physicians and staff. These services include dietary, linen, housekeeping, pharmacy, laboratory, surgery, administration, and others. Each area has specific and unique material and supply need creating a requirement in these facilities for supply management system that can provide the necessary supplies when needed. In the current scenario of increasing health care costs, systems inventory must be optimised without sacrificing the level of service provided.

Good inventory management is essential to the successful operation of any health care organization, for a number of reasons. One of the most important is the proportion of the organizations’ budget that represents money spent for inventory. Although the amounts and dollar values of the inventories carried by different types of health care providers vary widely, in
a typical hospital’s budget 25 to 30 percent goes for medical supplies and their handling. On the national scene, health care supplies constitute 8 to 9 percent of health care expenditures. According to Burns (2002), of supply costs, 15 to 23 percent is for pharmacy, 30 to 50 percent is for medical-surgical supplies, and 11 to 24 percent is for equipment.

Clearly, medical supplies require significant attention in health care budgeting. Furthermore, a widely used measure of managerial performance is the return on investment (ROI), which is profit after taxes, divided by total assets. Because the inventory of medical supplies may comprise a significant portion of a health care organization’s total assets, reducing its inventories significantly raises its ROI, and hence its position in the financial markets. Health care managers must be able to manage the inventory of medical supplies effectively.

2.9 Inventory Management practices and Health Service Delivery

Inventory plays a big role in the supply chain which is to increase the demand that can satisfied by having products available when the customer needs them. A few studies have examined how patients would set priorities, if forced to make choices or tradeoffs between technical and interpersonal quality in the primary care setting (Fletcher et al. 1983; Jung et al. 1998). Quality care must be given on time when required material is accessible in sufficient quality. Administration of stock assumes a critical part in giving proficient human services in connection to three essential parts of medicinal supplies utilized as a part of the wellbeing offices; security, accessibility, and moderateness.

1) Timing; the Most Crucial Aspect.

In healthcare delivery time factor is the most crucial aspect. Life can be lost by just a delay by a few seconds. Therefore, Inventory manager’s huge responsibility is ensuring most diverse healthcare commodities available on time. The expected patients number is unpredictable suppliers are unreliable and costs are rising. Hence making the challenge even greater,

ii) Patient safety; the first priority.

In healthcare delivery the patient wellbeing is the principal need, and critical part is played by directors of stock in ensuring their goal. Stock chief greatest obligation is to guarantee that great
quality items are obtained for clinical utilize. In spite of vital basis in surveying items being cost, clinical viability and wellbeing concerns are organized.

Administrators of stock ought to likewise guarantee that the supplied things are well inside the expiry time frame.

iii) Cost (Affordability); an important variable.

Enormous weight is on stock directors to start cost cutting measures. Colossal number of patients is requesting high quality at sensibly estimated social insurance administrations though the medicinal supply cost has been spiralling up. Inventory managers should continuously ensure they obtain better deals since supplies cost form significant portion of healthcare expense. For vast majority an economical price helps in ensuring affordable healthcare. Because of increased number of patients the healthcare reaps the benefit of increased revenue.

Innovative services and products flood the medical supply industry. Managers of inventory need to persistently scout for alternative competitive item or methods that outcome in better result. Nature of the item should be the essential worry with a specific end goal to guarantee that patient care is not traded off despite the fact that cost is an imperative rule.

2.9.1 Effect of Inventory Management on Healthcare Delivery

Inventory management systems obtain and move supplies and equipment to places where they are needed in a timely manner and at an optimum cost. Supplies and equipment usually cannot go directly from their source to the end user. They frequently must be held in the warehouse at some points along the way. In view of this warehouse of supplies maintained and inventory of supplies and equipment are held at all levels in the Zambian health system.

The inventory management system recognizes that staffs at all levels have a wide range of responsibilities (USAID, 2013). Access to essential medicines and supplies is fundamental to the good performance of the Healthcare facility and is commonly cited as the most important element of quality by healthcare consumers and, the absence of medicines and supplies is a key factor in the underuse of government health services.
2.10 Research gaps (in the literature)

This study is trying to solve the issues concerning service delivery problems at adult hospital UTH, it will tackle just one ward which is the E-Ward. To see if patients are getting the right services from the effective inventory management that the hospital operates on.

2.11 Research variables arising from literature review (brief)

There are two main variables which is independent and dependent variable. An independent variable is one that can be changed or controlled in a research to test the effects on the dependent variable. A dependent variable is the variable being tested and measured in a research.

Figure 2.1: Conceptual framework

From the conceptual framework, healthcare service delivery is the dependent variable which is been predicted by inventory management practices. The extent of this relationship is been tested in the research scope and study area.

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Dependent variable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inventory Management Practices</strong></td>
<td><strong>Healthcare service delivery</strong></td>
</tr>
<tr>
<td>1. Economic Order Quantity</td>
<td></td>
</tr>
<tr>
<td>2. Just-In-Time</td>
<td></td>
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<tr>
<td>3. Material requirement planning (MRP I)</td>
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<tr>
<td>4. Material requirement planning (MRP II)</td>
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<tr>
<td>5. Vendor Managed Inventory</td>
<td></td>
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<tr>
<td>6. ABC Analysis</td>
<td></td>
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<tr>
<td>7. Distribution resource planning (DRP)</td>
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</tbody>
</table>

The topic includes the research design, population under consideration, data collection Methods, research procedures and the methodology that were employed in the study.
2.12 Inventory management and competitiveness

A study conducted in Kenya by Naliaka and Namusonge (2015) identified that inventory management affects competitive advantage of manufacturing firms. The study further concludes that the firm is able to compete based on quality and that it delivers customer orders on time. Competitive advantage comprises capabilities that allow an organization to differentiate itself from its competitors and is an outcome of critical management decisions (Li et al. 2006). Effective inventory management provides opportunities to create sustainable competitive advantage and enhance the competitive position of companies. This entails reduction in cost of holding stocks by maintaining just enough inventories, in the right place and the right time and cost to make the right amount of needed products.

In most cases where inventory management decisions have been effective, inventory planning models have been developed and implemented focusing especially on the twin problems of inventory size and timing. Usually, inventory management models are designed to achieve a balance between the costs of acquiring and holding inventory and in so doing it makes it possible to know whether companies are earning profits or not. Variability of inventory majorly results due to firms not applying the inventory control systems in accordance with the baseline principles. According to Ogbo (2011), the information flow between leaf collection centres and factories is inadequate contributing significantly to high operational costs. Inventory of tea leaves is a requirement for the efficient operational performance; hence, inventory needs proper control as it is one of the largest assets of the factory. To excel in competitive environment, companies have to design and operate materials management and product distribution functions effectively.

2.13 Inventory Management Performance

Improving the performance of inventory management (drug management) in the Malaysian public hospitals require a good indicator to measure and to support a reduction in wastage. This study will look into the following performance indicators:
2.13.1 Operational performance

Saraste (2013) refers operational performance as the strength and swiftness of the logistic chain. One of the characteristics in the operational performance as mentioned by Bowersox, Closs, & Cooper (2002) is speed and the consistency of the supply chain. Handling inventory especially drug in medical store is very crucial due to drug can save lives of many if it is used in a good way, right time, right quantities, right quality and at affordable cost.

Studied done by Kagashe & Massawe (2012) in public hospitals in Tanzania showed that problems of maintaining stocks of drug at the level needs exist in Dar Es Salaam Region hospitals. Among the factors contributing to under stock of drug are lacks of funds, changing treatment guidelines, medicines not commonly used, unexpected increase of patients, small size of warehouse, bureaucracy, not paying supplier on time and procurement procedure too long (Kagashe & Massawe, 2012).

2.13.2 Problem solving performance

Basaran, 2013 states that if the inventory problems can faster be detected, the actions plan for the solution also can quicker be taken. Among the problem solving performance indicators of overcoming the problems as stated by Basaran (2013) are faster determination of the problems, acceptance of it, no hidden agenda, and solving without harm. Thus, ability to solve problems faster in effective and efficient ways is recognized as a performance benchmark before the problems get more and extent all over the whole productions. From the healthcare perspective, due to the hospital pharmacy plays a vital role in patients care, the problem solving performance may become a good indicator for hospitals in general and hospitals pharmacies in reducing operations costs and patient security through inventory management practices towards inventory management performance.

2.13.3 Decision making performance

Decision making related to management of inventory either in public or industries are complicated. Inventory managers are always facing with these situations in their daily operations.
As deciders, there are numerous categories of mutually involved systems that need link one another before deciding any decisions and it is behind intuitive power of inventory managers (Basaran, 2013). Among the indicators under decision making performances are faster, logic, scientific, and compliant when the inventory related decisions are being made. More than that, using of computer support, not conflict with other decisions in the organization and the decisions making have to be inform simultaneously to all departments can more contribute to better decision making (Basaran, 2013). Since medicine represents a critical component of healthcare, been notified as not well managed in hospitals pharmacies (Basaran, 2013) and inventory management has an impact on wastage (Stanger, Wilding, Yates, & Cotton, 2012), these study intended allows better decisions making to be made in leading to an improved practices of inventory management towards inventory management performance.
CHAPTER THREE

3.0 METHODOLOGY AND DESIGN

3.1 Overview

This study will be on quantitative and qualitative conducted at Adult hospital (UTH). It involves collection of data using a self-administered questionnaire on a selected on conveniently sampled number patients, head nurse is in charge of all wards in E ward (4) and all heads of units for the department of procurement.

3.2 Research Philosophy and approach

A conceptual framework was designed with inventory management practices of Adult hospital (UTH) being the centre of the problem analysis diagram. The inventory management practices used at Adult hospital were identified, and the markers of quality service delivery resulting from inventory management were derived. The self-administered questionnaire was developed using specific objectives as reference points.

This study is a mixed methods study, which combines the qualitative and quantitative research methods. Mixed methods research is a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis of data and the mixture of qualitative and quantitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems that either approach alone. It is important to note the difference between mixed methods and multiple methods. The distinction between these is described by Leech et al. as follows:

mixed methodologies is distinguished from multiple methodologies, wherein mixed methodologies refers to approaches in which quantitative and qualitative research techniques are integrated into a single study, whereas multiple methodologies refer to approaches in which more than one research method or data collection and analysis technique (including two or more methods within the same paradigm) is used to address research questions.
The origins of mixed methods lie in the two major research paradigms: quantitative and qualitative. Qualitative studies rely on description and interpretation, instead of making measurements like in quantitative studies. Qualitative purists support a constructivist (construction of a personal reality or realities) or interpretivist (understanding based on interpretation) paradigm. Qualitative research is usually described as allowing a detailed exploration of a topic of interest in which information is collected by a researcher through case studies, survey, interviews, and so on. Quantitative research as a type of research that is explaining phenomena by collecting numerical data that are analysed using mathematically based methods (in particular statistics). Purists call for researchers to “eliminate their biases, remain emotionally detached and uninvolved with the objects of study and test or empirically justify their stated hypotheses” Integral to this approach is the expectation that a researcher will set aside his or her experiences, perceptions, and biases to ensure objectivity in the conduct of the study and the conclusions that are drawn.

The research performed through mixed methods implies the adoption of a strategy that involves more than one research method. Creswell speaks about three types of strategies of mixed methods: sequential mixed methods, concurrent mixed methods and transformative mixed methods. Sequential mixed methods are procedures in which the researcher seeks to elaborate on or expand on the findings of one method with another method. This may involve beginning with a qualitative interview for exploratory purposes and following up with a quantitative, survey method with a large sample so that the researcher can generalize results to a population. Alternatively, the study may begin with a quantitative method in which a theory or concept is tested, followed by a qualitative method involving detailed exploration with a few cases or individuals.

Concurrent mixed methods are procedures in which the researcher merges quantitative and qualitative data in order to provide a comprehensive analysis of the research problem. In this design, the investigator collects both forms of data at the same time and then integrates the information in the interpretation of the overall results. Transformative mixed methods – the researcher uses a theoretical objective as a global perspective in a design that contains both quantitative and qualitative data.
This objective provides a frame for the topic, data collection methods and results anticipated through the study. Such an objective could comprise a method of data collection that involves a sequential or a concurrent approach. For the purposes of this study, the concurrent mixed methods approach will be used to provide a comprehensive analysis of the research problem.

3.3 Research design

Research design is the plan and structure of investigation so conceived as to obtain answers to research questions. A quantitative approach was followed. Burns and Grove (1993) define quantitative research as a formal, objective, systematic process to describe and test relationships and examine cause and effect interactions among variables.

A descriptive survey design was used. A survey is used to collect original data for describing a population too large to observe directly (Mouton, 1996). A survey obtains information from a sample of people by means of self-report, that is, the people respond to a series of questions posed by the investigator (Polit and Hungler, 1993). In this study the information was collected through self-administered questionnaires distributed personally to the subjects by the researcher. This was prospective cross-sectional study conducted at Adult hospital (UTH) from 5 of June 2020.

3.4 Research strategy

The strategy in this study was focused on Adult hospital (UTH) which was selected based on being a busy medical wards at UTH, with high patient input and output hence providing a good study. A case study of inventory management due to the high volumes of consumable requirement, hence this study is qualitative and quantitative in nature, in that not only does it involve the collection of numeric data but also a questionnaire and survey is conducted.

3.5 Research choice

This research was carried out to further understand how the public institution inventory management practices are done.
3.6 Time Horizon

Data will be collected over a period of one month from July 2020 – August 2020.

3.7 Conceptual model, and operationalization of research variables

Mathematical model was used for our conceptual framework. Research variables were categorized as independent or dependent variables.

3.8 Source of data

Raw data was collected from the patients, ward managers and from head of units in the procurement department. Supplementary data was collected from desk review of journal articles and books.

3.9 Primary Data

Primary data refers to the information collected by the researcher who will also examine that data. Researchers collect primary data through interviews, questionnaires, focus groups, observation, the examination of primary sources such as writings or speeches, or a variety of other collection methods. For purposes of this study, a self-administered Questionnaire and one on one interview with various organizations were used to collect primary data.

3.10 Secondary Data

Secondary data in this study, referrers and information collected in the past for other uses by a party which is not related to this study, but is beneficial to a researcher. These sources may include, books, journal articles, internal records etc. For purposes of this study, literature review was the main source of secondary data from books, journals, reports, ICC statutes, and international instruments.

3.11 Sampling frame

Convenient sampling method was used to select patients from each of the six wards, the ward managers of the six wards and heads of units of the procurement department. A sampling frame is any material or device used to obtain observational access to the finite population of interest.
A population is a complete set of all items and possible observations of the type that is being investigated, such as among others, individuals, institutions, households or items from which a sample is taken. A sample is the actual group selected for a study using any appropriate sampling techniques and, it must be of sufficient size to allow the research have confidence in the inference, while the sampling technique is the process of drawing a sample from the population.

3.12 Sample size

There are six E wards and one procurement department for the Adult department. There are six nurses in-charge for such ward and all report to one overall head (n=1) and heads of units (n=15). Five patients were selected at random using numbers 1-10.

3.13 Sampling techniques (discuss the techniques)

Convenience sampling involves participants being selected based on availability and willingness to take part. Useful results can be obtained, but the results are prone to significant bias, because those who volunteer to take part may be different from those who choose not to (volunteer bias), and the sample may not be representative of other characteristics, such as age or sex. Simple random sampling involves that any individual can be chosen entirely by chance and each member of the population has an equal chance, or probability, of being selected. And in this case E Wards was selected among the wards at UTH for this research.

The two sampling techniques were applied to the members of the population in this study.

3.14 Purposive Sampling

In purposive sampling (sometimes called judgmental sampling), the researcher specifies the characteristics of a population of interest and then tries to locate the individuals who have those characteristics. Once the group is located, the researcher asks those who meet the inclusion criteria to participate in the research study. In short, purposive sampling is a non-random sampling technique in which the researcher solicits persons with specific characteristics to participate in a research study.

In this study, the characteristics of the population of interest comprises of UTH employees and Patients.
3.15 Dimensional Sampling

This is the type of selection where various factors assumed to be of importance in a survey are incorporated by the researcher into the sampling procedure in a manner that allows at least one representative of every possible combination of these factors to be included.

3.16 Data collection techniques

Self-administered questionnaire was used to collect data from patients, ward managers and heads of units as well as Interviews.

3.17 Questionnaire

A questionnaire is a set of questions that are asked as a basic way of getting information on a topic of interest. Questionnaires are doubtless one of the primary sources of obtaining data in any research endeavour. However, the critical point is that when designing a questionnaire, the researcher should ensure that it is “valid, reliable and unambiguous” Both generic and specific closed-ended and open-ended questions were covered in the questionnaire. Specifically, the three questionnaires were administered to serve the purpose of extracting generic and specific information concerning the objectives of this research.

A number of people were interviewed in this study, these include, UTH employees and Patients as well as other people with knowledge prior to this research.

3.18 Interviews

The third main type of data collection method used in this research is the interview contends that “Interviews are a popular and widely used means of collecting qualitative data.” To this end, the researcher wants to get first-hand information directly from some knowledgeable informants.

There are many types of interviews, the common being structured interview, unstructured interview, and semi-structured interview. Structured interview consist of a series of pre-determined questions that all interviewees answer in the same order. Unstructured interview is the opposite, in that the flexibility of this type is wide open. Interviewees can elaborate, leading in unpredictable directions. In this type of interview the order of the questions can be changed depending on the direction of the interview.
This research adopted a semi-structured interview approach. This type is a mix of the two types mentioned above, where the questions are pre-planned prior to the interview but the interviewer gives the interviewee the chance to elaborate and explain particular issues through the use of open-ended questions.

A number of people were interviewed in this study, these include, UTH employees and Patients as well as other people with knowledge prior to this research.

3.19 Reliability & Validity

Piloting of self-administered was done on patients, ward managers and heads of units to determine reliability and validity of the data collected. Reliability and Validity are important concepts in research as they are used for enhancing the accuracy of the assessment and evaluation of a research work. They have different meanings under the different types of research i.e. quantitative and qualitative research, Creswell. Under quantitative research, reliability refers to the consistency, stability and repeatability of results i.e. the result of a researcher is considered reliable if consistent results have been obtained in identical situations but different circumstances.

Validity is the extent to which any measuring instrument measures what it is intended to measure. It is possible for a measurement to be reliable but invalid; however, if a measurement is unreliable, then it cannot be valid. Under qualitative research, reliability is referred to as when a researcher’s approach is consistent across different researchers and different projects. Validity is when a researcher uses certain procedures to check for the accuracy of the research findings. In order to strengthen the validity of the research data and instruments, the researcher applied the method of triangulation. This involves the process of collecting data through several sources: questionnaires, interviews and classroom observations etc. Gathering data through one technique can be questionable, biased and weak. However, collecting information from a variety of sources and with a variety of techniques can confirm findings. Therefore, if the researcher obtains the same results, he/she can become sure that the data is valid. Certainly, through triangulation we can gain qualitative and quantitative data in order to corroborate our findings. This study adopted two data collection methods, namely; interviews and self-administered questionnaire.
3.20 Ethical considerations

The proposal to carry out the study was submitted to the dean for clearance and approval was granted. Making sure that there is total confidentiality and the information obtained will be for academic use. The people interviewed were informed in advance of the research and what it sought to achieve. Confidentiality of information was emphasized to the respondents to do away with the fears of victimization to allow free disclosure of information.

The researcher communicated the ethical issues to the various respondents and made an effort to create a climate of comfort for the respondents; letting the respondent know that participation is voluntary.

The respondents were assured that their responses were treated as confidential and used only for academic purposes in this study. A letter of introduction from, Cavendish University Zambia was presented together with the questionnaire and before the start of any interview to all respondents to ensure that they participate in the study voluntarily and from an informed point of view.

3.21 Limitation of study

The limitations are that data was collected from only one section of the UTH hospitals which may not be representative of all the different wards at the hospital at UTH who may have very diverse needs and requirements.

3.22 Conclusion

In conclusion Chapter three has discussed the methodology used in conducting this research. Which adopted a mixed method research where both qualitative and quantitative data was collected to make a comprehensive analysis of the research findings? The research used purposive and dimensional sampling techniques and adopted the following data collection methods: Questionnaire, and Interviews. The research further discussed ethical considerations, which is one of the most important parts of the study.

While the researcher did their level best to get the required information in order to identify the challenges faced by the adult hospital patients in terms of service delivery, little came out of the
patients due to fear. And this led other questionnaires not to be collected due to the outbreak of the corona virus.
CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction
This chapter focuses on presentation and analysis of data based on existing documents, reviews and research objectives. The main themes in this case on which data shall be presented and analyzed shall be the established research objectives.

4.2 Insight On the Framework and Interpretation of the Questionnaire
A self-administered questionnaire was used in this study. The main purpose for using a questionnaire was to collect primary data that would complement data collected through document review technique.

4.3 Presentation, Analysis and Interpretation of the Questionnaire
A total of 16 questionnaires were distributed to respondents at the Adult hospital UTH which is considered to be key in this research field. The questioner comprises of four parts which are; Firstly the Background of the Respondents, secondly Inventory Management Practices, thirdly effect of inventory management on healthcare service delivery and fourthly challenges of inventory management at UTH.

4.4 INVENTORY MANAGEMENT SURVEY QUESTIONNAIRE FOR STAFF RESPONDENTS AT ADULT HOSPITAL UTH

Table 4.1: Part 1: Background Data

<table>
<thead>
<tr>
<th>DEMOGRAPHY</th>
<th>CHARACTERISTICS</th>
<th>FREQUENCY</th>
<th>FREQUENCY (PERCENTAGE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENDER</td>
<td>FEMALE</td>
<td>9</td>
<td>56%</td>
</tr>
<tr>
<td></td>
<td>MALE</td>
<td>7</td>
<td>44%</td>
</tr>
<tr>
<td>AGE</td>
<td>20-30</td>
<td>4</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>8</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>4</td>
<td>25%</td>
</tr>
</tbody>
</table>
This study is determining the different demographic characteristics of respondents by trying to conclude on their understanding and knowledge of the questions that were given to them in the questionnaire. As can be seen in Table 4.1, 9 (56%) (n=16) of the participants were females and 7 (44%) (n=16) were males from whom the responses were gathered. And the age ranges, it’s seen that 25% were between 20 to 30, followed by about 50% who were between the age of 31 to 40 years. And lastly 25% were the age of 41 to 50 years. On their educational background, it is seen that (19%; n=16) of them are HND certificate or equivalent. And about 13% are 1st degree holders, 13% master’s degree, nursing certificate at 13% and lastly other qualifications 44%. The respondents were from different units of the hospital which included E-ward 13%, laboratory
stores 13%, medical & surgical stores 13%, pharmacy stores 13%, general stores 6% and lastly the purchasing department with 44% responses. It was found that most respondents were from the senior staff with 75%, and 25% were junior staff. About 31% respondents have worked in the hospital for less than 1 year, whereas about 25% have worked between 1 to 3 years and lastly 13% and 31% have worked in the hospital for 7 to 9 years and 10 and above years.

4.5 INVENTORY MANAGEMENT PRACTICES OF ADULT HOSPITAL UTH

Through observations during this research, additional findings were realized that total inventory held at Adult hospital are mostly medical consumables that includes drugs, medical and surgical items, laboratory equipment as well as office consumables such printing stationery, fuel and lubricants, safety gadgets, first aid materials, batteries and toner, etc. Some of the respondents agreed that inventory management policies do exist. These policies indicate how stock is replenished and are done manually. Stocktaking is only done when necessary. They do not use inventory models but bin cards and requisitions forms to control inventory.

The respondents were asked to indicate at which level do they agree with the statement in relation to inventory management practices at Adult hospital UTH and they responded from different parts under the variable five-point Likert scale (1=Agree, 2=Indifferent and 3=Disagree). The research findings are as indicated in Table 4.5 below showing the percentages on the respondent’s view.

**Table 4.5a: lean inventory system of Adult hospital**

<table>
<thead>
<tr>
<th>Variable</th>
<th>AGREE</th>
<th>DISAGREE</th>
<th>INDEFFERENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lean Inventory System</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respondents</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation of Just-In-time (JIT) purchasing system where no safety stocks are kept</td>
<td><strong>7</strong></td>
<td><strong>44 %</strong></td>
<td><strong>5</strong></td>
</tr>
<tr>
<td><strong>Agreements with supplier for short cycle deliveries (items which doesn’t take long to</strong></td>
<td><strong>5</strong></td>
<td><strong>31 %</strong></td>
<td><strong>6</strong></td>
</tr>
<tr>
<td><strong>Respondent</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>38 %</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Accurate prediction of supplier delivery dates  | 7  | 44% | 6  | 38% | 3  | 19%  
Operation of materials Requirements planning system (MRP) – where bills of materials are 100% accurate  | 5  | 31% | 6  | 38% | 5  | 31%  
Little or no expediting  | 8  | 50% | 8  | 50% | 0  | 0%  

It is indicated in Table 4.5 that Adult hospital UTH ensures that lean inventory system (LIS) as an inventory management practice has shown that (44%;n=16) Agree to the fact that “the operation of just-in-time (JIT) purchasing system-where no safety stocks are kept” is practiced. (31%;n=16) Disagree and (38%; n=16) felt indifferent. “Agreements with supplier for short cycle deliveries (items which doesn’t take long to deliver)”, (31%; n=16) Agree, (38%; n=16) Disagree and indifferent (31%; n=16). LIS as inventory management ensures that “Accurate prediction of supplier delivery dates” is practiced and that majority of the respondents (44%; n=16) have Agreed, (38%;n=16) Disagree and (19%;n=16) Indifferent. “Operation of materials Requirements planning system (MRP) – where bills of materials are 100% accurate” (31%; n=16) agreed, (38%; n=16) Disagreed and (31%; n=16) Indifferent. And “lastly Little or no expediting” (50%; n=16) agreed, (50%; n=16) disagree and (0%) indifferent.

This implies that LIS as inventory management practice at adult hospital UTH ensures that Agreements with supplier for short cycle deliveries (items which doesn’t take long to deliver), Accurate prediction of supplier delivery dates, Little or no expediting and Operation of Just-In-time (JIT) purchasing system where no safety stocks are kept. And this is supported by other studies like (Stock and Lambert, 2001).

<table>
<thead>
<tr>
<th>Table 4.5b: strategic partnerships of Adult hospital UTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>STRATEGIC SUPPLIER PARTNERSHIPS</td>
</tr>
<tr>
<td>Involving suppliers early in product design process</td>
</tr>
<tr>
<td>Use of suppliers to manage inventory on behalf of the hospital (Vendor managed Inventory)</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Use of fewer suppliers as opposed to many suppliers.</td>
</tr>
<tr>
<td>Frequent meetings between hospital’s inventory staff and the suppliers</td>
</tr>
<tr>
<td>Complete information sharing between the hospital and its suppliers</td>
</tr>
<tr>
<td>Proper communication between the hospital and suppliers</td>
</tr>
<tr>
<td>Long – term agreements between the hospital and its suppliers</td>
</tr>
</tbody>
</table>

It is seen from Table 4.5b that Adult hospital UTH ensures that strategic supplier partnership (SSP) as an inventory management practice 7 questions were asked to measure the SSP, and from what can be seen in the table “Complete information sharing between the hospital and its suppliers” was the most agreed with (56%;n=16) Agree, (44%;n=16) and (0%;n=16), as seen in the table “Proper communication between the hospital and suppliers” had the highest response with (81%;n=16) Agree, (19%;n=16) Disagree and (0%;n=16) indifferent. “Long – term agreements between the hospital and its suppliers” with (56%;n=16), (31%;n=16) disagree and (13%;n=16) indifferent.

Others with the least response that was measured in percentage include “Involving suppliers early in product design process” with (19%;n=16) Agree, (50%;n=16) Disagree and (31%;n=16) Indifferent.
“Use of suppliers to manage inventory on behalf of the hospital (Vendor managed Inventory)” with (19%n=16) Agree, (75%; n=16) Disagree and (6%; n=16). “Use of fewer suppliers as opposed to many suppliers” with (44%; n=16) Agree, (56%; n=16). And lastly “Frequent meetings between hospital’s inventory staff and the suppliers” with (19%; n=16) Agree, (75%; n=16) Disagree and (6%; n=16).

This implies that Adult hospital UTH ensures strategic supplier partnership as inventory management practice as indicated and is supported by other studies like Stock and Lambert, 2001) and (Frahm, 2003).

Table 4.5c Information Technology of Adult hospital UTH

<table>
<thead>
<tr>
<th>INFORMATION TECHNOLOGY</th>
<th>7</th>
<th>44%</th>
<th>9</th>
<th>56%</th>
<th>0</th>
<th>0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>The hospital has computerized all inventory management systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The hospital’s computers are linked with those of suppliers in a real time environment</td>
<td>4</td>
<td>25%</td>
<td>11</td>
<td>69%</td>
<td>1</td>
<td>6%</td>
</tr>
<tr>
<td>The hospital uses Electronic Data Interchange Technology (EDI)</td>
<td>5</td>
<td>31%</td>
<td>10</td>
<td>63%</td>
<td>1</td>
<td>6%</td>
</tr>
</tbody>
</table>

Table 4.5c indicates that Adult hospital UTH ensures information technology (IT) as an inventory management practice as it shows that majority disagree. Like item 1 “The hospital has computerized all inventory management systems” with (44%; n=16) agree, (56%; n=16) disagree and indifferent. Item 2 “The hospital’s computers are linked with those of suppliers in a real time environment” with (24%; n=16), (69%; n=16) disagree, (6%; n=16) indifferent. And lastly “The hospital uses Electronic Data Interchange Technology (EDI)” with (31%; n=16) agree, (63%; n=16) disagree and (6%; n=16). This implies that Adult hospital does not use much of information technology as inventory management practice as indicated.
4.6 PART 3: EFFECT OF INVENTORY MANAGEMENT PRACTICES ON HEALTHCARE SERVICE DELIVERY

This is the third objective of the study which is to determine the effect of inventory management practices has on the healthcare service delivery level of the hospital. For this to be achieved staff respondents were given questions to determine their level of agreement. A 3 point scale was employed, measuring “1 Agree, 2 Disagree and 3 indifferent was used to measure the effect. The responses to this are as displayed in Table 4.6 below.

Table 4.6 Effect of inventory management practices has on healthcare service delivery level

<table>
<thead>
<tr>
<th>Variable</th>
<th>AGREE</th>
<th>DISAGREE</th>
<th>INDIFFERENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Respondents</td>
<td>%</td>
<td>Respondents</td>
</tr>
<tr>
<td>Inventory Management practices contribute greatly to the healthcare service delivery of UTH</td>
<td>15</td>
<td>94%</td>
<td>1</td>
</tr>
<tr>
<td>Inventory Management practices helps in inventory planning and scheduling in UTH</td>
<td>15</td>
<td>94%</td>
<td>1</td>
</tr>
<tr>
<td>Long Procurement procedures affect inventory management and healthcare service delivery of UTH</td>
<td>16</td>
<td>100%</td>
<td>0</td>
</tr>
<tr>
<td>Insufficient funds towards Inventories contribute greatly to the poor healthcare service delivery of UTH</td>
<td>16</td>
<td>100%</td>
<td>0</td>
</tr>
</tbody>
</table>
Inadequately trained staff in the inventory management section at UTH contributes greatly to the poor healthcare service delivery of UTH.

<table>
<thead>
<tr>
<th>Question</th>
<th>Agree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequately trained staff in the inventory management section at UTH contributes greatly to the poor healthcare service delivery of UTH.</td>
<td>9</td>
<td>0%</td>
</tr>
<tr>
<td>Improved customer service can be realized with proper inventory management at UTH.</td>
<td>13</td>
<td>13%</td>
</tr>
</tbody>
</table>

The staff respondents agree with all the questions to measure the effect of inventory management practices on healthcare service delivery of Adult hospital UTH. It is seen from Table 4.6 that all the six questions were agreed to be true from the respondents that the effect of inventory management practices does make an impact on service delivery. The effect that received the highest response was “Long Procurement procedures affect inventory management and healthcare service delivery of UTH” with (100%; n=16) Agreed and “Insufficient funds towards Inventories contribute greatly to the poor healthcare service delivery of UTH” with (100%; n=16).

Other effects that had a positive response were “Inventory Management practices contribute greatly to the healthcare service delivery of UTH” with (94%; n=16) Agreed and (6%; n=16) disagree “Inventory Management practices helps in inventory planning and scheduling in UTH” with (94%; n=16) and (6%; n=16). “Inadequately trained staff in the inventory management section at UTH contributes greatly to the poor healthcare service delivery Of UTH” with (56%; n=16) Agreed and (44%; n=16) Disagree. “Improved customer service can be realized with proper inventory management at UTH” with (81%; n=16) and (6%; n=16).

This implies that inventory management practices of Adult hospital UTH has an effect on their healthcare service delivery level which includes inventory planning and scheduling improved customer service.
4.7 CHALLENGES OF INVENTORY MANAGEMENT AT ADULT UTH

The last objective of the study is to determine the inventory management practices on Adult hospital UTH. For this to be achieved, questions on challenges that can ease against inventory management practices at Adult hospital UTH were given to the staff respondents to determine their level of agreement. A 3 point scale was employed, measuring 1 Agree, 2 Disagree and 3 Indifferent were used to determine the challenges. The responses to this are as displayed in Table 4.7 below.

Table 4.7 Challenges of inventory management practices at Adult hospital UTH

<table>
<thead>
<tr>
<th>Variable</th>
<th>AGREE</th>
<th>DISAGREE</th>
<th>INDEFFERENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Respondents</td>
<td>%</td>
<td>Respondents</td>
</tr>
<tr>
<td>Delays in delivery of drugs leading to insufficient inventories</td>
<td>16</td>
<td>100%</td>
<td>0</td>
</tr>
<tr>
<td>Use of outdated storage facilities</td>
<td>12</td>
<td>75%</td>
<td>4</td>
</tr>
<tr>
<td>Use of manual inventory management system/Lack of technology</td>
<td>16</td>
<td>100%</td>
<td>0</td>
</tr>
<tr>
<td>Lack of training</td>
<td>7</td>
<td>44%</td>
<td>8</td>
</tr>
<tr>
<td>Holding too much/too little inventory</td>
<td>8</td>
<td>50%</td>
<td>6</td>
</tr>
<tr>
<td>Bureaucratic process in procurement</td>
<td>12</td>
<td>75%</td>
<td>2</td>
</tr>
<tr>
<td>Loss of drugs through inventory shrinkages</td>
<td>9</td>
<td>56%</td>
<td>7</td>
</tr>
<tr>
<td>Conflict of interest</td>
<td>10</td>
<td>63%</td>
<td>6</td>
</tr>
</tbody>
</table>
From the data collected to determine the challenges of inventory management at Adult hospital UTH, the respondents gave significant response to the questions asked. From Table 4.7 the findings show that all the questions were attended to with regards to whether they agreed or felt indifferent to the challenges. The challenges that received the highest positive response was: “Delays in delivery of drugs leading to insufficient inventories”, “Use of manual inventory management system/Lack of technology”, “Insufficient funds for procurement” with 100% agreement to the challenge.

Other challenges that staff respondents agreed that indeed the effect of inventory management practices at Adult hospital includes “Conflict of interest” with 63% agreed, 38% disagreed, “Weak management system” with 63% agree, 31% disagree and 6% felt indifferent, “Use of outdated storage facilities” with 75% agree, 25% disagree, “Bureaucratic process in procurement” with 75% agree, 13% disagree and 13% felt indifferent.

The challenges with the lest response were; “Loss of drugs through inventory shrinkages” 56% agree, 44% disagree, “Purchase of drugs with a near expiration date” with 19% agree, 81% disagree, “Overstocking/under stocking” with 44% agree, 31% Disagree and 25% felt indifferent, “Lack of training” with 44% agree, 50% disagree and 6% felt indifferent, “Holding too much/too little inventory” with 50% agree, 38% disagree and 13% felt indifferent.

This implies that Adult hospital UTH is faced by some challenges that mitigate against their inventory management practices including Delays in delivery of drugs leading to insufficient inventories, Use of outdated storage facilities, Use of manual inventory management
system/Lack of technology, Bureaucratic process in procurement, Conflict of interest, Weak management system and Insufficient funds for procurement.

4.8 Health service delivery level of Adult hospital UTH

This is the second objective of the study which is to evaluate the service delivery level of the Adult hospital UTH. In order for this to happen, questions were asked to random patients (as the end users) at E-ward of the hospital to help assess the healthcare delivery of the hospital using some parameters. Using a 3-point Likert Scale, patients were asked to rate the level of satisfaction to parameters with a satisfied, dissatisfied and neither. Table 4.8 shows the responses of the patients in assessing the healthcare delivery of Adult hospital UTH.

Table 4.8 Health service delivery level of Adult hospital UTH

<table>
<thead>
<tr>
<th>Service delivery items</th>
<th>Satisfied</th>
<th>Dissatisfied</th>
<th>Neither</th>
</tr>
</thead>
<tbody>
<tr>
<td>respondents</td>
<td>%</td>
<td>Respondents</td>
<td>%</td>
</tr>
<tr>
<td>Reliability of Healthcare Service (24 hour service and full complement of Medical Staff)</td>
<td>5</td>
<td>100%</td>
<td>0</td>
</tr>
<tr>
<td>Completeness of Healthcare Service</td>
<td>4</td>
<td>80%</td>
<td>1</td>
</tr>
<tr>
<td>Empathy of Healthcare Staff</td>
<td>5</td>
<td>100%</td>
<td>0</td>
</tr>
<tr>
<td>Affordability of Healthcare Service (Payment)</td>
<td>5</td>
<td>100%</td>
<td>0</td>
</tr>
<tr>
<td>Aesthetics (Physical Appearance of Healthcare Service)</td>
<td>5</td>
<td>100%</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 4.8 illustrates that the patients agreed to all the questions used to measure service delivery level at Adult hospital UTH. It could be seen from this that the patients were highly satisfied with all the questions used to measure the perception on service delivery.

The patients were more satisfied with the following; “Reliability of Healthcare Service (24 hour service and full complement of Medical Staff)”, “Completeness of Healthcare Service”,

44
“Empathy of Healthcare Staff”, “Affordability of Healthcare Service (Payment)” and “Aesthetics (Physical Appearance of Healthcare Service)”. With 100% response.

This implies that inventory management practice do have an impact on service delivery at Adult hospital UTH and is supported with other studies like (Hu, Cheng and Hong, 2011) and (Hollis, 2006) who talked about service quality and its importance.

4.9 Interviews

The research could not get the required additional information from the patients due fear of intimidation and reprimand.
CHAPTER FIVE

DISCUSSION OF THE FINDINGS

5.0 Introduction

This chapter will give a summary of the findings of the study; these findings are the objectives of the research that has been answered.

5.1 Summary of the findings

To ensure the achievement of the study objectives, the summary of the findings are presented in relation to the objectives of the study. The following are the main findings from the previous chapter.

5.1.1 Inventory management practices at Adult hospital UTH

It’s the first objective of the study which was to determine the inventory management practices at Adult hospital UTH. The study revealed that total inventory is medical consumables. From observations it was realized that inventory management policy were practiced. Stock is replenished manually and stocktaking has no agreed time but done when necessary. The respondents seemed not used to inventory models but preferred using bin cards and requisitions to manage inventory.

For ensuring lean inventory system as inventory management practice, Adult hospital ensures Agreements with supplier for short cycle deliveries (items which doesn’t take long to deliver), Accurate prediction of supplier delivery dates, Little or no expediting and Operation of Just-In-time (JIT) purchasing system where no safety stocks are kept.

Adult hospital ensures that strategic supplier partnerships as inventory management practice as responses indicated from the previous chapter. The findings revealed that Adult hospital does not use much of information technology as inventory management practice as indicated.
5.1.2 Health service delivery level of Adult hospital UTH

This is the second objective of the study was to evaluate the service delivery level of the Adult hospital UTH. This study shown that inventory management has huge impact on service delivery and Adult hospital benefits from it. It was seen that the patient respondents agreed to all the questions used to measure service delivery of Adult hospital. It was viewed that the responses in E-wards was satisfied with almost all the questions that the researcher used to measure patients perception of service delivery. However, the measures that patients thought to be more satisfying includes “Completeness of Healthcare Service”, “Empathy of Healthcare Staff”, “Reliability of Healthcare Service (24 hour service and full complement of Medical Staff)”, “Affordability of Healthcare Service (Payment)” and “Aesthetics (Physical Appearance of Healthcare Service)”.

5.1.3 Effect of inventory management practices on service delivery level of the hospital.

This is the third objective of the study was to determine the effect of inventory management practice on service delivery level of the hospital. It was viewed that respondents highly agreed to the questions asked to measure the effect of inventory management practices on health care service delivery of Adult hospital UTH. This implies that inventory management practices of Adult hospital UTH has an effect on their healthcare service delivery level which includes inventory planning and scheduling improved customer service.

5.1.4 Challenges of inventory management at Adult hospital UTH

The last objective of the study was to identify the challenges faced Adult hospital in what hinders the implementation of the practices and inventory control polices. It was revealed that challenges which hinder effective and efficient types of inventory that they hold. The study also revealed some of these challenges which include Delays in delivery of drugs leading to insufficient inventories, Use of outdated storage facilities, Use of manual inventory management system/Lack of technology, Bureaucratic process in procurement, Conflict of interest, Weak
management system and Insufficient funds for procurement, which was indicated as major problems or threats on the implementation of effective inventory control practices.

5.1.5 Interview

This study had also undertaken an interview to evaluate the healthcare service levels at Adult hospital UTH. And unfortunately could not the information required from the E-ward patients due to fear of intimidation and reprimand.
CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter gives a final summary of the findings of the study, the conclusion and the recommendation for stakeholders that will ensure effective and efficient management of inventory in healthcare institutions.

6.2 Conclusion

Effective inventory management is upheld to be a potential driver for enhancing profit margins. Minimizing total inventory of cost through identifying an optimum level of inventory that an organization holds is the way forward. A well-functioning inventories management will bring both economic benefit in terms of profitability and bring good image to the company. It will enable the company to undertake projects on time and bring out quality finished products of the company. When a company implements effective inventories management systems, the firm’s efficiency is enhanced. This has an impact on the level of performance in terms of turnover, growth, management and ultimately profitability as supported by previous studies by Oballah et al. (2015), Anichebe and Agu (2013) and Ogbo et al. (2014).

This study required to investigate the inventory management practices on healthcare service delivery. It can be determined from the study that Adult hospital has been practicing inventory management. But, its effectiveness and how those practices were followed by the management and staff were somehow with some challenges. Therefore, practical measures should be put in place to reduce such challenges to achieve effective and efficient inventory control in healthcare institutions.

There is need to ensure that all the inventory management plans and policies are being followed, and how the use of effective efficient monitoring system is important. This will need recruitment of well qualified employees to management the inventory system and by setting up functioning information systems which will be used to manage the system. And staff should learn to understand the importance of inventory management.
6.3 Recommendations

Due to challenges of inventory management revealed in the study, the researcher recommends the following guidelines to necessary to enhance efficiency in the current practices adopted by the company in management its inventory:

From observation there is need to emphasize the importance of inventory management to the management, not only should staff from management know the importance but each person in the hospital in the hospital should know the importance of inventory control and other processes that include avoidance of people storing items where there are not supposed to be and learning to keep track of inventory movements.

Erratic funding to the institution has led to a lot of planned actives not being undertaken. The institution should make sure that all funds are split according to the class of items that needs more spending or not to avoid overshadowing other planned actives. Locally generated funds can be prudently used for the fulfillment of the procurement plan according to the needs of the user department and inventory reorder point system can be supported. Hence the government should generate enough funds to avoid setbacks.

By computerizing an inventory management system, having sufficient funds towards inventory management and having shorter procurement procedures to award end users waiting for too long.

Inventory control can be done properly if the funds are available and this can only happen if the hospital attends tenders using ministry of health, they have to go for big tenders sign by ministry of health.

A system to keep track of inventory on hand and on order, a reliable forecast of demand that includes an indication of possible forecast error, knowledge of lead time and load time variability, reasonable estimates of inventory holding costs and ordering costs and lastly sufficient funds for procurement.

The need for trained personnel and in house training should also one the issues that should be taken to consideration.
A LIST OF REFERENCES


Ballou, R.H. (2004), Business Logistics/Supply Chain Management: Planning,


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Appendix I

CAVENDISH UNIVERSITY ZAMBIA SCHOOL OF BUSINESS AND INFORMATION TECHNOLOGY

INVENTORY MANAGEMENT SURVEY QUESTIONNAIRE (Administered to UTH Staff)

This questionnaire is part of a project work required by the Cavendish University School of business and Information Technology as a partial requirement for the award of a Degree in purchasing and supply. The questionnaire is designed to ask you of your independent views on “the effect of inventory management practices on service delivery at adult hospital, UTH”. All information provided shall be treated as confidential and used strictly for Academic purpose. Please answer the following questions by ticking [√] from the scale to 1-7 freely without indicating your name.

<table>
<thead>
<tr>
<th>Part 1: Background Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Your Gender?</td>
</tr>
<tr>
<td>Male [ ] Female [ ]</td>
</tr>
<tr>
<td>2. What is your age?</td>
</tr>
<tr>
<td>Less than 20 [ ] 20-30 years [ ] 31-40 years [ ] 41-50 years [ ] 51 and above [ ]</td>
</tr>
<tr>
<td>3. Which unit of the hospital do you work?</td>
</tr>
<tr>
<td>E Wards (male or female) [ ] procurement department [ ]</td>
</tr>
<tr>
<td>4. How long have worked for the hospital?</td>
</tr>
<tr>
<td>Less than 1 year [ ] 1-3 years [ ] 4-6 years [ ] 7-9 years [ ] 10 years and above [ ]</td>
</tr>
<tr>
<td>5. What is your level of education?</td>
</tr>
<tr>
<td>JHS/SHS [ ] HND/Equivalents [ ] 1st Degree [ ] Master’s degree [ ] Nursing Cert [ ] other, specify………………………………………………………………………………</td>
</tr>
<tr>
<td>6. What category of staff are you?</td>
</tr>
<tr>
<td>Management [ ] senior staff [ ] junior staff [ ]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part 2: INVENTORY MANAGEMENT PRACTICES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>Please the extent to which you agree with the following as practised at UTH………</td>
</tr>
<tr>
<td>Lean Inventory System</td>
</tr>
<tr>
<td>Operation of Just-In-time (JIT) purchasing system – where no safety stocks are kept</td>
</tr>
<tr>
<td>Agreements with supplier for short cycle deliveries (items which doesn’t take long to deliver)</td>
</tr>
<tr>
<td>Accurate prediction of supplier delivery dates</td>
</tr>
<tr>
<td>Operation of materials Requirements planning system (MRP) – where bills of materials are</td>
</tr>
<tr>
<td>100% accurate</td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td>Little or no expediting</td>
</tr>
<tr>
<td>Agreements with supplier for short cycle deliveries (items which doesn’t take long to deliver)</td>
</tr>
<tr>
<td><strong>Strategic Supplier Partnerships</strong></td>
</tr>
<tr>
<td>Involving suppliers early in product design process</td>
</tr>
<tr>
<td>Use of suppliers to manage inventory on behalf of the hospital (Vendor managed Inventory)</td>
</tr>
<tr>
<td>Use of fewer suppliers as opposed to many suppliers.</td>
</tr>
<tr>
<td>Frequent meetings between hospital’s inventory staff and the suppliers</td>
</tr>
<tr>
<td>Complete information sharing between the hospital and its suppliers</td>
</tr>
<tr>
<td>Proper communication between the hospital and suppliers</td>
</tr>
<tr>
<td>Long – term agreements between the hospital and its suppliers</td>
</tr>
<tr>
<td><strong>Information Technology</strong></td>
</tr>
<tr>
<td>The hospital has computerized all inventory management systems</td>
</tr>
<tr>
<td>The hospital’s computers are linked with those of suppliers in a real time environment</td>
</tr>
<tr>
<td>The hospital uses Electronic Data Interchange Technology (EDI)</td>
</tr>
</tbody>
</table>

### PART 3: EFFECT OF INVENTORY MANAGEMENT ON HEALTHCARE SERVICE DELIVERY

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Indifferent</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Please the extent to which you agree with the following the effect of inventory management on healthcare service delivery at UTH……

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventory Management practices contribute greatly to the healthcare service delivery of UTH</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Inventory Management practices helps in inventory planning and scheduling in UTH</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Long Procurement procedures affect inventory management and healthcare service delivery of UTH</td>
<td>[]</td>
<td>[]</td>
</tr>
</tbody>
</table>
Insufficient funds towards Inventories contribute greatly to the poor healthcare service delivery of UTH

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Indifferent</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Inadequately trained staff in the inventory management section at UTH contribute greatly to the poor healthcare service delivery of UTH.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Indifferent</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Improved customer service can be realized with proper inventory management at UTH.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Indifferent</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**PART 4: CHALLENGES OF INVENTORY MANAGEMENT AT UTH**

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Disagree</th>
<th>Indifferent</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delays in delivery of drugs leading to insufficient inventories</td>
<td>[]</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Use of outdated storage facilities</td>
<td>[]</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Use of manual inventory management system/Lack of technology</td>
<td>[]</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Lack of training</td>
<td>[]</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Holding too much/too little inventory</td>
<td>[]</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Bureaucratic process in procurement</td>
<td>[]</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Loss of drugs through inventory leakages</td>
<td>[]</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Conflict of interest</td>
<td>[]</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Weak management system</td>
<td>[]</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Insufficient funds for procurement</td>
<td>[]</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Purchase of drugs with a near expiration date</td>
<td>[]</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Overstocking/under stocking</td>
<td>[]</td>
<td>[]</td>
<td>[]</td>
</tr>
</tbody>
</table>

Could you provide any suggestions for effective inventory management at the university teaching hospital?
Thank you for your help in answering these questions