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**CHAPTERS 1 & 2**

**ASSESSING THE IMPACT OF INVENTORY MANAGEMENT ON QUALITY SERVICE DELIVERY IN GHANA SERVICE. A CASE STUDY OF LEKMA HOSPITAL**

**PRESENTED BY**

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**CHAPTER ONE**

**INTRODUCTION**

**1.0 Introduction**

This chapter comprise of the Background, Problem Statement, Objectives of the Study, Research Questions, Limitations of the Study and Organization of the Study

**1.1 Background of the Study**

Every organization must have some inputs and raw materials of some kind in order to serve its customers. Organizations exist for the purpose of serving its customers. In fact no business organization can exist without input which refers to anything that is put in, taken in or operated upon, and is transformed into something different and desirable by customers. Little wonder that Bicheno (2011) is of the opinion that most businesses must have stock of raw materials, purchased components and sub-assemblies before it can produce finished goods.

In today’s competitive corporate world where the customer is king and every product or service has alternative, businesses is faced with a lot of challenges including retaining its customers. Eckert (2012) argues that much of the activity involved in managing relationships is based on the management of inventory. Thus, in the process of finding solution to sustenance of customers to maintain competitive market, all organizations including the LEKMA Government Hospital lay emphasis on areas such as marketing, accounting, auditing, customer care and inventory management to the background. In the context of inventory management, the firm is faced with the problem of meeting two conflicting needs:

* To maintain a large size of inventory for efficient and smooth service provision.
* To maintain a minimum investment in inventories to maximize profitability.

Both excessive and inadequate inventory are not desirable. These are two danger points within which the organization should operate. The objective of inventory management should be to determine and maintain optimum level of inventory investment. The optimum level of inventory will lie between the two danger points of excessive and inadequate inventories.

The major dangers of over investment in inventories are:

* Unnecessary tie-up of the firm’s funds and loss of profit.
* Excessive carrying costs,
* Risk of liquidity

The excessive level of inventories consumes funds of the firm, which cannot be used for any other purpose, and thus, it involves an opportunity cost. The carrying costs, such as the cost of storage, handling, insurance, recording and inspection also increase in proportion to the volume of inventory. These costs will impair the firm’s profitability further. Excessive inventories carried for long-period increase chances of loss of liquidity. It may not be possible to sell inventories in time and at full.

Nonetheless, maintaining an inadequate level of inventories is also dangerous. The consequences of under-investment in inventories are:

* Production hold-ups
* Failure to meet delivery commitments.

Agus and Noor (2010) points out that demand and supply forecasting helps the organization to minimize operational costs, increased efficiency and on time delivery of goods and services. It is against this background that the study seeks to draw an efficient and effective inventory management blueprint that will ensure a continuous supply of raw materials to facilitate uninterrupted service provision, maintain sufficient stocks of raw materials in periods of short supply and anticipate price changes, minimize the carrying cost and time and Control investment in inventories and keep it at an optimum.

**1.2 Statement of the Problem**

To meet the expectations of the patients and general public, one must 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 (Agus and Noor, 2010).

Bozarth and handfield (2007) opined that, in service providing industries including the LEKMA Government Hospital, the desire is to implement the right policies and procedures that will best determine and regulate production schedules to establish requirements, parts, and materials needed to support service delivery and improve upon efficiency. This is not the case in most public hospitals in Ghana. Inventory management in LEKMA Hospital is not smooth. Poor inventory control has led to many problems which has affected the quality of health care in the hospital over the past years. Drugs and non-drug consumables availability has been below 60% in the hospital over the years according to statistics from the non-drug consumables and pharmacy unit of the hospital. This has resulted in prolonged sickness and in some cases death of the innocent patient. Shortages of essential drugs, non-drugs consumables and even oxygen for resuscitation account for about 15% of deaths recorded in the hospital (Hospital annual report, 2010).

Moreover improper procedures for receiving, issuing, and disposal of non-drug consumables, and medicine have been the order of the day. This has contributed to increased patients dissatisfaction, prolonged illness, and increased needless death and has resulted in a decline in out-patient attendance. The challenge facing inventory is compounded as a result of rampant thievery and pilfering and serious audit queries over the years. (Hospital survey report, 2013) This study seeks to access the inventory management practices in public hospitals with particular reference to the LEKMA Government Hospital in the Greater Accra Region of Ghana.

**1.3 Objectives of the Study**

The main objective for the study is to assess the impact of inventory management on quality service delivery in LEKMA Government hospital. The specific objectives are stated below:

1. To explain the effect of inventory planning on quality healthcare delivery.
2. To determine the effect of inventory control practices on quality healthcare delivery.
3. To evaluate the effect of inventory monitoring on quality health care delivery.
4. To examine the effect of inventory management information systems on quality healthcare delivery.

**1.4 Research Questions**

This research seeks to provide answers to the following questions;

1. What is the effect of inventory planning on quality healthcare delivery?
2. What is the effect of inventory control practices on quality healthcare delivery?
3. What is the effect of inventory monitoring on quality health care delivery?
4. What is the effect of inventory management information systems on quality healthcare delivery?

**1.5 Justification of the Study**

To guarantee improved health care delivery, inventory management cannot be relegated to the background. Lackadaisical attitude to the management of inventories in health care often result in cost to the hospital, uncured illness, preventable death of innocent patients, poor reputation and low quality of service. The rising cost of goods, materials, and services warrant judicious management of resources in the hospitals of which inventory account for the biggest chunk. It is very reasonable for management of public hospitals and inventory managers who have a responsibility for inventory and to have adequate knowledge on inventory management in a more scientific way. The issues concerning inventory management have taken a center stage because it has a direct effect on productivity. The psychological and behavioral attitude of employees will be revealed to help management to provide the right tools to develop a good inventory policy to help provide better health care to the people of Ghana. It will also add to the existing knowledge on inventory management and it effect on performance most importantly in the health dispensation.

**1.6. Summary of Research Methodology**

This research employed a case study strategy with information gathered from primary and secondary sources. Primary data would be collected through questionnaires from senior managers and inventory staff of LEKMA Government Hospital. A self-administered questionnaire would be sent out to respondents to collect data from management of the hospital and store staff. Existing documents on inventories in the hospital would be reviewed as well as a review of published and unpublished journals, articles books, reports, and lecture notes.

**1.7. Scope of the Study**

The research would be carried out at LEKMA Government Hospital because the researchers wants the inventory management of the hospital to be abreast of current trends. The work focused on inventory management. All information shall be gathered from the stores section and other related department. The population for the study would be restricted to 50 staff of the case study area.

**1.8 Chapter Organization**

This project work is divided into five chapters.

Chapter One provides a general introduction and set the basis for the study. Chapter Two discusses relevant literature and empirical evidence related to inventory management. Chapter Three describes the methodology used in gathering data for the research. The study population, the sample and sampling procedure, research instruments, data collection procedure and data analysis procedure would be described in this chapter. Chapter Four presents and discusses the findings. Finally, Chapter Five summarizes the findings, draws conclusions and makes recommendations for the attention of policy makers, parents and administrators. It also suggests areas for further research.

**CHAPTER TWO**

**LITERATURE REVIEW**

**2.0 Overview**

According to Rushton et al (2010), the inventory function has moved from being perceived as an administrative support where there was little or no support and comprehension of the importance of good inventory management by top management in the past to the contribution that it could make to corporate success as more enlightened organizations are beginning to accept that inventory management is a vital ingredient to overall business success. This chapter will review related literature that are related to the subject of this study highlighting some of the current strategies that are assisting practitioners to increase performance in the area of inventory management. The chapter will consider empirical and theoretical literature involve in the subject matter.

**2.1 Definition of Key Concepts**

This section encompasses Inventory management, Inventory Control Techniques.

**2.1.1 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). According to Lyons and Farrington (2012), some of the reasons for keeping inventory are to reduce the risk of supplier uncertainty, meet unexpected demands and protect against lead time uncertainties. Effective management of inventory is a major concern for firms in all industries (Mentzer, et al., 2007). According to Meng (2006), all firms (including JIT operations) keep a supply of inventory for the following reasons:

1. **To maintain independence of operations.** A supply of materials at a work center allows that center flexibility in operation because there are costs for making each new production setup and this inventory allows management to reduce the number of setups. Independence of workstations is desirable on assembly lines as well. The time that it takes to do identical operations will naturally vary from one unit to the next unit. Therefore, it is desirable to have a cushion of several parts within the work station so that shorter performance times can compensate for longer performance time. This way, the average performance can be fairly stable
2. **To meet variation in product demand.** If the demand for the product is known accurately, it is then possible to produce the product to synchronize with demand, however demand for a product is not known so a buffer must be kept to cater for variations
3. **To allow for flexible production schedule.** Stock of inventories relives pressure on production due to long lead time that allow for lower cost, smooth flow and larger lot size.
4. **To hedge against variations in raw materials delivery time.** Suppliers can delay delivery of materials for a variety of reasons such as shortage of materials at supplier site, accidents, shipments of incorrect order, and lost order.
5. **To take advantage of economies of scale.** Placing an order comes with an attached cost such as labor, phone call, typing, posting, inspection, and offloading cost. A larger order reduces the frequency of order, thus saving cost. Shipping cost favors larger order as the larger the order, the lower the shipping charge per unit

**2.1.2 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:

**2.1.2.1 Periodic Review System**

Arnold and chapman (2004), the periodic review system predetermines the quantity to order mostly at fixed-time intervals. The review period is fixed and the order quantity is allowed to change each time it is desired. The quantity in stock and the quantity ordered must be adequate until the next order t is received.

**2.1.2.2 Two-bin System**

According to Arnold and chapman (2004), in a two bin system, materials required is ordered in two fold for the first time and divided into two. One is set aside and not touched until the first one is completely used up. Immediately the first bin is used up, order is placed to refill it while the second bin is in use. The quantity of item in the first bin serves as to order quantity to be ordered. The two-bin system is the ideal method of keeping control of items of low value so that enough time is concentrated on critical items.

**2.1.2.3 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.

**2.1.2.4 Economic Order Quantity (EOQ)**

Kinney, and Raiborn (2011), the economic order quantity (EOQ), is a model which represents the least costly number of units to order that will balance the cost of ordering to the cost of holding the said goods. The EOQ dictate the optimal balance between ordering and carrying costs by mathematically equating total ordering costs to total carrying costs. EOQ is a very common inventory control tool that is very easy to use. Even though the EOQ is relatively very easy to use, it relies on some assumptions. According to Lysons and Gillingham (2003), to calculate the Economic Order Quantity, a mathematical model of reality must be constructed based on assumptions. Supported by Arnold et al (2008), the assumptions on which the EOQ is based are as follows:

1. A constant fixed and known demand.
2. The item is produced or purchased in lots or batches and not continuous.
3. Costs of raising order and cost of holding the order do not change and known.
4. Order is received promptly or immediately there is a call for it.

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. According to Quinn (1993), EOQ formula is given as \*Q = (2DCp/Ch.) 1/2

Where:

\*Q = Economic Order Quantity

D = Yearly demand

Cp. = Cost of Placing an order

Ch. = Carrying cost per unit year

The EOQ decision involve identifying an optimal cost compromise between low inventory holding cost and high ordering cost.

**2.2 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 (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.

**i) Timing**

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.

**ii) Patient safety**

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 20 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)**

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 spiraling 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.

**2.3. Theoretical Review**

**2.4. Empirical Study**

This section presents handpicked of studies in other countries related to inventory management

Ogbo et al. (2014), after studying 7up Bottling Company in Nile Mile Enugu, Nigeria, opined that Country Government find it hard to effectively manage inventory in Nigeria and that led to high operational costs. The study by Koross et al., (2016) was in consonance with the Ogbo et al. (2014). This implies that despite efforts so far undertaken in the health project sector in Nigeria and Kenya, health projects are still unable to deliver health services. When a company implements effective inventory management systems, the firm’s efficiency is enhanced.

Staffs and management have attached little attention to inventory control and that has led to service failure in the public sector hospitals. To emphasize the relevance of stock management to staffs, Kaile (2020) undertook a study to establish the effects of inventory management practices on service delivery at Adult Hospital in **Zambia**. The study relied heavily on both quantitative and qualitative methods. Two types of data was used. Primary data was collected from the patients, ward managers and from head of procurement department. Supplementary data was collected from desk review of journal articles and books. The gaps are that, data was collected from only one section of the case-study hospital which may not be representative of all the different wards (Units) at the hospital who may have very diverse needs and requirements. The second drawback is that the study emphasize the importance of inventory management to the staff from management, and not management itself or each person in the hospital.

In Ghana, a research work with the topic” the impact of Inventory Management Practices in Health Service Delivery” was done in Edubiase, Ghana by Kwansah (2020). The study highlighted relevant criteria to improve upon inventory management practices. However, something is still lacking.As indicated by Koross et al., (2016), over 65 percent of key government health projects are being affected due to poor inventory management practices. Clearly, with such a huge figure, studies on Edubiase alone is not a good representation. Another researcher has to undertake a research with related topic in another government hospital, missionary hospital or a private hospital to help inventory management have greater impact in health delivery in the country. This explains our choice of LEKMA hospital.

**2.5 Conceptual Framework of the Study**

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.

**Figure 2.1: Conceptual framework**

Based on the new objectives, please draw a new framework.

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. 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.

1. What is the effect of inventory planning on quality healthcare.
2. What is the effect of inventory control practices on quality healthcare delivery.
3. What is the effect of inventory monitoring on quality health care delivery.
4. What is the effect of inventory management information systems on quality healthcare delivery.