

The Impact of Inventory Management Practices in Health Service Delivery: A Look at the New Edubiase Government Hospital

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Abstract

The research work focused on Inventory Management in practices in health service delivery organization and the case study was the New Edubiase Government Hospital. The main objectives of this study was to look at what inventory is and to come out with relevant criteria to improve upon inventory management practices in the New Edubiase Government Hospital (NEGH). The specific objective includes identifying inventory management practices at the New Edubiase Government Hospital, determining if the inventory management practices are efficient and effective, and to investigate the challenges confronting the management of inventory in the Hospital. The researcher then gave a brief insight into the chosen case study organization. Stratified random sampling was adopted to select a sample size of sixty workers for the study. The investigator used the primary method of data collection to gather information for the study. The investigator found out that the materials ordered are not received on time, unauthorized personnel are allowed into the stores, and store keys are left at the security gate upon closure of work. Based on the findings, the researcher proposed some recommendations which include coordination between suppliers and stores to ensure faster delivery of supplies, bringing to an end unauthorized entry into the stores, and the store keys to be handled by only store staffs.

Keywords: *Inventory, Management Practices, Impact of Inventory*

I. 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. All manufacturing organizations 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. In the process of finding solution to sustenance of customers to maintain competitive market, all organizations including the New Edubiase Government Hospital (NEGH) lay emphasis on areas such as marketing, accounting, auditing, customer care and public relation and relegate inventory management to the background. Lowe (2002) states that 'inventory is a detailed list of goods'. It is impossible to offer any meaningful health service to the satisfaction of patients and clients without the availability of inventory. Quality health care essentially is dependent on the availability of quality inventory at the right time. In the absence of inventory, health service delivery is severally affected. People dying at the various hospitals in Ghana could be prevented and the pace of sick patients getting healed can be faster if inventory management is given the attention it needed in the various health facilities. The very recent accident that occurred on the Kintampo road involving a Metro Mass Transit bus that claimed the lives of over 60 people was partly due to non-availability of inventory. Sallah (2006) reported on GhOnetv that 'the accident killed over 60 people because of lack of medical supplies and other essential first aid deliveries'. She went on further to report that 'there was no oxygen and even common emergency drugs were not available, and the ambulance can carry only two people at a time'. The irony is that while there is shortage of basic essential medications and other basic inputs at almost all public health facilities, a large number of varieties of some expensive drugs go waste as a result of lack of best practices of inventory management techniques. This leads to a reduced customer service. Martin, (2001), noted that customer relationships value is present especially in the service sector, because services are intangible, and the time customers have to evaluate services before deciding to make a purchase commitment is non-existent. Service providers are the most tangible aspect of service and, the customers see them as the service itself. Customers' view of quality of the relationship with the service provider goes hand in hand with the quality of the service itself because the evaluating services first before to making purchase commitments is difficult and cannot be quantified.

Medicines and drug consumables comes with instructions that must be followed if a patient is to benefit from the full effect of its efficacy. Any drug that you pick from the pharmacy shelf have instructions such as 'store well in a close container, keep in a cool dry place, protect from light, this side up, temperature must be within a stated range'. The potency of any drug will be greatly compromised when it is stored in structures with poor ventilation, dust, heat, rickety shelves, and lack of inventory handling equipment. Ghana health service has a policy that all public hospitals sourced all drugs and non-drugs consumable from the Regional Medical Stores as a first step to replenish stock, however most hospitals do not get their required inventories at the RMS translating into no supplies in the hospitals and the result is needless deaths of patients, prolonged ailments and poor healthcare delivery. Poor inventory management in healthcare delivery raises a lot of concern that cannot be swept under the carpet as health is wealth. According to Brotherton, (2000), organizational wealth translates into organizational health financially. He further states that 'whether someone of sick or healthy is as a result of the attention given to ensure a fit between the person and the environment that encompasses a mix of demand, support and constraints that comes with the work, and the self-esteem of the individual which boost lower level of stress and a greater level of physiological wellbeing. It is an established fact that the growth of any economy hugely depends on the health of its citizens as increased productivity depends on the health status of workers. The impact of inventory cannot be brushed aside in an effort to seek good health and thus its management is very vital. It is for this reason that the Ghana Health Service has a motto that states 'your health is our concern'. Again the team for the national health policy in the year 2007 was 'creating wealth through health' (National Health Policy, 2007). It is becoming imperative for managers of inventories in the health sector to design and implement a flawless system of managing their stock of raw materials to assure quality of supply to the operating points to improve health care delivery in hospitals. It is against these backgrounds that the researcher developed interest in investigating inventory management to try to identify inventory practices that ensures efficient delivery and based on the above factors, the New Edubiase Government Hospital was chosen as a case study.

A. Statement of the Research Problem

The major aim of inventory management is to ensure availability of materials to user department without delay and the prevention of stock out. The control of inventories has become such a heavy task that needs the attention of not only inventory practioners staff but also top management to provide the right structures for inventory operation. This has become more prevailing in today`s strategic management decisions, which is geared towards profitability and adding value.

Bozarth and handfield (2007), inventory is such a critical resource in many organizations and efforts must be made to devote tools and techniques to manage it. In service providing industries including the New Edubiase 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. Best practices in the management of drugs and non-drug consumables as well as information flow are the cardinal points in achieving quality health care. The surest way to maintain these critical factors is the proper management of inventory both within the firm and all its supply chain actors.

This is not the case in in most public hospitals in Ghana. Inventory management in New Edebiase 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 New Edubiase Government Hospital in the Adansi South District of the Ashanti Region of Ghana to bring to light the

causes of poor inventory management practices and suggest appropriate recommendations to help improve health service delivery

B. Objectives of the Study

The main objective for the study is to identify what inventory is and to come out with relevant criteria to improve upon inventory management practices in the public hospitals.

I. Specific objectives will include:

- a.* To identify inventory management practices at the New Edubiase Government Hospital.
- b.* To determine if the inventory management practices are efficient and effective.
- c.* To investigate the challenges confronting the management of inventory in the Hospital
- d.* To investigate the internal control systems employed to overcome the challenges confronting inventory management.
- e.* To provide remedial measures to the improvement of inventory management practices in the hospital to improve health service delivery.

C. Research Questions

This research seeks to provide answers to the following questions;

- What inventory management practices are used in New Edubiase Government Hospital?
- Are the inventory management practices employed efficient and effective?
- What are the specific challenges confronting management of inventory in the hospital?
- What internal control systems are in place to help overcome the challenges of inventory management in the hospital?
- What remedial measures can be provided to improve inventory management in the Hospital to improve health service delivery?

D. 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 its effect on performance most importantly in the health dispensation.

E. Research Methodology

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

F. Scope of the Study

The research was carried out at New Edubiase Government Hospital because the researcher wants the inventory management of the hospital to be abreast of current trends. The work focused on inventory management. All information was gathered from the stores section and other related department. The population for the study included all workers of the case study area.

G. Limitation of the study

This research faced some limitations. Foremost was time constraint on the part of the researcher. The researcher is a worker and a family man and it was a challenge balancing the requirement of time on work, family and the research. Secondly this research required a study into different hospitals for a better analysis of the project, however due to financial constraints, and time on the part of the investigator, the study was limited only to New Edubiase Government Hospital.

H. Organization of the Study

The research work was divided into five main chapters. The first chapter gave an introduction to the study and it comprised of background of the study, statement of the research problem, objective of the study, research questions, justification of the study, research methodology, scope of the study, limitation of the study, and organization of the study. Chapter two dealt with the literature review aspect of the study on inventory management and models. Chapter three covered the methodology employed and a profile of New Edubiase Government Hospital. The method of data collection used for the study was also explained, including sampling technique, population, primary and secondary data collection instruments. The research presentation, interpretation, and analysis of empirical data obtained from the field were next dealt with in chapter four. Finally the fifth and last chapter summarized the findings, conclusion and recommendations made for an improved inventory management in health service delivery

II. LITERATURE REVIEW

According to Lambert et al (1998), inventories account for the greatest investment and can represent more than 50% of wholesalers' total assets. Effective inventory management is about aligning internal and external resources with corporate strategy to optimize quality, value and cost to be able to achieve competitive merit and profitability in service organization. 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.

A. Meaning of inventory

According to Frazelle (2002), 'inventory ensures smooth running of logistics and that the planning, storing, and accounting for inventory are the primary aim for all logistics. The customer service goal is that he is served with his/her order'. According to Lambert et al (1998), inventory is huge and expensive and thus to enhance positive cash flow and return on investment calls for good management of inventory. A lot of organizations suffer as a result of inventory because they lack a comprehensive understanding of the techniques used in the management of inventory resulting in customer dissatisfaction. The stores carries inventory items with the intention of satisfying customers demand as they arise, Quayle (2006). Inventory also called stock is the accumulation of all kinds of incoming consignment needed for production which can be in the form of solid, liquid, gaseous, semi-finished or components parts from outside suppliers, stored, and issue out as and when they are needed, Slack et al (2007). Inventory function in any organization is for the purpose of assisting in the production of goods or services and because of this, no organization of any significant size can be efficiently managed without it. The primary aim is to provide a service to the point of operation and this aspect must always be the focus.

B. Meaning of Management

Mullins, (1999) defines management as 'the process common to all functions carried out within an organization with objectives which are the end result that the organization is trying to achieve'. Wit and Meyer (1999) define management as an art of skillfully handling a process. Management thus means to guide or control something or an activity well or to narrow it down to inventory, to succeed in the efficient operating of inventory. This makes management the act or skills of controlling and making decisions about a process. It embraces organizing, planning, controlling and directing the resources of a company in order to fulfill objectives of a policy.

C. Meaning of Inventory Management

According to Lowe (2002), 'inventory management is the prudent management of raw materials, parts, works in progress, and finished goods, that is necessary to ensure capital investment returns and the visible availability of stock levels to prevent opportunity cost'. Inventory, also known as stock, is 'the stored accumulation of transformed resources in a process; usually applied to materials resources but may also be used for inventories of information', (Slack et al (2007)). To operate successfully, it is impossible to negate inventory to the background. Materials are needed to ensure continuous operations to satisfy the numerous customers. Inventory has a purpose why it is held and this purpose is very useful to all organizations. According to Lambert et al (1998), the purpose of inventory in any organization be it manufacturing, service, not for profit or government include:

- Enabling firms to achieve economies of scale. This is where the firm in questions procures needed supplies in large quantities, reducing the unit cost or enjoying quantity and cash discounts.
- Balancing supply and demand because supply and demand cannot be perfectly synchronized due to reasons such as strikes, sickness, unplanned rapid request and seasonal materials.
- Providing assurance against unknown demand in order cycle
- Serving as a buffer within the channel of distribution.

Inventory function is concerned with having in excess a level of stocks, under the correct storage conditions, for future use by other departments. To realize these objectives, inventory management has a number of duties, including receiving, storing, and issuing stock, controlling the movement of stock, controlling all storage units, controlling material handling procedures, overseeing quality and quantity control, overseeing staff training, and implementing clerical and administration duties. The inventory function provides a service to the company as a whole and to individual user departments. Inventory function provide services to the production departments to ensure that materials are available as and when needed, distribution departments, to ensure that all finished products are marshaled and ready for dispatch, sales departments, to ensure that stocks for sale are stored and issued correctly and accounts departments to ensure that information on the value of stock, goods received, and invoice queries are provided promptly.

D. Types of Inventory

Companies have different stock types within its supply chains and they are held at various points within company logistics network beginning with the supplier and ending with the customers. Rushton et al (2010) grouped inventories into the following:

- **Raw material, component and packaging stocks** – this is used to feed into a production or manufacturing process.
- **In-process stocks** – this is called work-in-progress (WIP), and it includes partially finished stock found within the different manufacturing processes.
- **Finished products** – stocks that come of the production ready for supply to customers.
- **Pipeline stocks**- These are held in the distribution chain for eventual transfer to the final customer.
- **Spare parts** –They serve as back-up to machinery or plant during breakdown. They are also stocked by service and maintenance companies for their customers in service contracts and include maintenance, repair and overhaul (MRO). They include nuts, bolts, and and repairable parts that require periodic maintenance repairs.

In the opinion of Lambert et al (1998), inventory is grouped as a result of the rationale for which they are assembled. They are made up of cycle stock, which are replenishments made as materials are used in production when there is certainty in demand. In-trans inventories on the other hand are materials en route from one location to another, safety or buffer stock is held as a result of uncertainty in demand or the lead time may fail, speculative stock is held for other reason outside of satisfying demand, seasonal stock is stocked accumulated during seasonal period.

E. Reasons Why We Hold Inventory

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. According to Meng (2006), all firms (including JIT operations) keep a supply of inventory for the following reasons:

- **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. 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.
- **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.
- **To allow for flexible production schedule.** Stock of inventories relieves pressure on production due to long lead time that allow for lower cost, smooth flow and larger lot size.
- **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.
- **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

F. Procedure Manual

According to Jessop and Morrison, (1994), procedures are instructions and rules on how the work of stores must functions. This means that procedures are systems of segregated steps and methodical approach to roll out the services of stores. If employees do not follow these procedures, they are, in effect, transgressing a moral code. Cohen (1995) A procedures manual is thus a step by step procedure which in the opinion of Donaldson (1984) “constitutes a combination of “technical” (what people should do) and “prudential” (what attitude should be adopted) imperatives, and they also involve a moral imperative where employees should follow the procedures contained within the code”. In any stores operation, there should be some discipline as well as routine and instructions must be given about procedures. Verbal instructions have limitations and at such some amount of written guidelines are necessary. The bigger the organization, the more important is written procedures and as time goes on, it is necessary to revise, extend and standardize all existing instruction to produce a comprehensive document called inventory manual.

G. Inventory Control

Lowe (2002), inventory control is simply keeping materials in good condition so that it is not stolen, or pilfered and that it is supplied when it is needed. Controlling inventory is a daunting task as a well-controlled inventory can positively affect the fortunes of the company and vice versa. Inventories are held because demand and supply cannot be perfectly matched, however stocking too inventory result in a high holding cost and having not enough results in an increase in the cost of order. There is no need to stock large quantities of goods which are available at short notice. Quayle (2006). Inventory control is necessary because of budgetary control, and financial accounting. Some philosophies such as just in time (JIT) advocate that inventory should not be held at all, however stocking inventory is vital for some industry including health facilities and at such must be controlled to minimize cost and enhance service delivery. In a health facility, the attitude to inventory is to be proactive as needs are not usually known in advance. Drugs and other consumables must be available before a patient set foot into the hospital to receive health care. The management of inventory in a hospital is not the same as that of a manufacturing company because the hospitals do not seek for a greater profit from drug sales but rather emphasis is placed on enhanced service level before a consideration is given to minimization of cost and losses.

H. Inventory Control Techniques

Inventory control is the activity of ensuring that customers are served with their need. It organizes purchasing, manufacturing and distribution functions to meet customer needs. Stock control seeks to balance inventory such that each item is held within its proper limit to ensure that items do not run out of stock. Stock is controlled by means of fixing for each item, stock level which are recorded in stock control system and used as a means of when action should be taken Appiah-Mensah (undated p 25-31) opine that the following stock levels are used mostly in the control of inventory are:

- **Safety stock:** **Safety stock** this is held because demand cannot be predicted perfectly. Safety stock is the spare material between supply and demand. It helps in the maintenance of customer service and help manufacturing to operate without stress, wild (1997). It is simply the quantity of stock held to cover variations in demand or delivery delays.
- **Minimum stock level:** This is the lowest level that materials should not normally fall below because if inventory fall below this level, there is the possibility of incurring excess stock out cost. The minimum stock is usually kept as a buffer to cushion the organization from having no stock at all. The minimum stock is calculated as $\text{minimum stock level} = \text{reorder level} - (\text{average consumption} \times \text{average lead time})$. Minimum stock represents the danger level that can lead to stock out.
- **Maximum stock level:** This is the highest point which stock should not be allowed to exceed because exceeding the maximum stock level will incur cost such as capital tied up in stock, damages to stock, theft, more storage cost and insurance premium increase. Maximum stock level is calculated as $\text{maximum stock level} = \text{reorder level} - (\text{minimum usage} \times \text{minimum lead time}) + \text{reorder quantity}$.
- **Re-order level:** This is the quantity of stock expressed in unit of issue at which ordering action is initiated before stock fall to the minimum stock level.

I. Inventory Control Approach

Inventory practitioners must make decisions concerning stock such as how much to order and when to order? How many suppliers and transport operators do we use? These, helps in making decisions concerning inventory control approach. Organizations must select approaches that serve them best as defined by the corporate goals such as:

- **Independent demand inventory items:** This is demand for an item that is independent of the demand for any other item. Demand for independent items is seen as a forecasted demand and they are mostly finished goods. Rushton et al (2010)
- **Dependent demand inventory items:** Inventory items whose demand is as a result of some other item. Such demand is thought of as derived demand and mostly is not finished goods but rather materials, parts, sub-assemblies and accessories that make up the finished good. Waters (2003).
- **Just In Time (JIT).** The principle behind just in time (JIT) is to order the items only when they are needed and not to place order when they are not needed or simply due to uncertainties. This is a simple idea as JIT has given the opportunity to eliminate stockholding without affecting customer service. Wild (1997). JIT is a philosophy of eliminating all waste to focus on productivity improvement. Inventory is brought in only when it is needed. To successfully implement JIT, is to embrace the supplier in a co-makership agreement such that the supplier is seen as an extension of the company. It involves having only stock when it is needed to upgrade quality to zero defects. This means that there should be a reduction in lead time, setup time, queue length and the size of lots, and all these must be achieved at the minimum cost. Yielded advantage includes stock reduction, inventory level reduction, less need for materials handling equipment, less time needed between production and delivery, immense quality improvement and employee inclusion in continuous quality improvement. Muller (2003).
- **Materials requirement planning:** Materials requirements planning (MRP) is a “push-through” system where finished inventory are based on forecast of demand. MRP is able to forecast each stage of production requirement through demand forecast of the final product producing a detailed bill of materials for each final

product which is commensurate with the available inventories of materials, components, and products. Maintaining accurate inventory records and costs is critical in an MRP system. Horngren et al (2012).

- **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.
- **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 is received.
- **Economic Order Quantity.** 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 Arnold et al (2008), the assumptions on which the EOQ is based are as follows:

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

These assumptions are mostly ideal to finished goods whose demand pattern is independent and uniform, however there are times where the assumptions are not feasible and the EOQ concept cannot be put into practice. For instance, there is no reason to calculate the EOQ for made-to-order items in which the customer specifies the order quantity, Arnold et al (2008),

According to Quinn (1993), EOQ formula is given as $*Q = (2DC_p/Ch.)^{1/2}$

Where *Q = Economic Order Quantity

D = Yearly demand

C_p = 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.

J. Inventory Cost

Inventory always comes with cost as the organization that need the inventory must always procure the needed materials. The cost of inventory must be known so as to determine it relationship within the organization.

Rushton et al (2006), 'opined that there are four principal elements of inventory holding cost and they are:

- **Capital cost:** The cost of the physical stock. This is the financing charge that is the current cost of capital to a company or the opportunity cost of tying up capital that might otherwise be producing a better return if invested elsewhere. This is almost always the largest of the different elements of inventory cost.
- **Service cost:** The cost of stock management and insurance.
- **Storage cost:** The cost of space, handling and associated warehousing costs involved with the actual storage of the product.

- **Risk cost:** It occurs as a consequence of pilferage, deterioration of stock, damage and stock obsolescence. With the reduction in product life cycles and the fast rate of development and introduction of new products, this has become a very important aspect of inventory cost. It is one that is frequently underestimated by companies. It is particularly relevant to high-tech industries, the fashion industry’.

K. Classification of Inventory

All items held in inventory do not have equal weight with regards to the potential to generate profit, sales rate or usage volume. This calls for the classification of all inventory held in stock. The ABC analysis, also called Pareto analysis or the 80/20 rule according to waters (2007), presents a way of describing different categories of risk based on the observation that 20 percent of the risk causes 80 percent of concern while the remaining 80 percent of risk only cause 20 percent of concern.

Arnold et al (2008), the ABC inventory classification determining the merit attached to items and allow diverse modes of control based on the different levels of importance attached to each items. The classification is necessary due to the large number of items in stock. To achieve optimum cost, it is insightful to group the items based on their importance which is mostly based on yearly dollar usage, or other usage that the company concern find useful. The ABC principle classifies inventories into three groups namely:

- Group A which account for 20% of the items in stock and 80% of the dollar usage.
- Group B which account for 30% of the items in stock 15% of the dollar usage.
- Group C account for 50% of the items in stock and 5% of the dollar usage.

An items are very important items and close attention is given to it while C items receive loose control. This does not mean that C items are not vital; however the value of C item is not as huge as compared to A items. B items must have control that lie between A and b items.

L. Valuation of Inventory

Inventory valuation methods are used to determine the cost of goods sold and closing inventory at the end of the day. The method is used only to account for usage of goods held in inventory.

Arnold et al (2008), there are four methods of accounting used to value inventory and they are:

- **First in first out (FIFO).** FIFO method says that the oldest (first) item brought in stock is the first to be used or sold. The cost of the first goods received is charged against the cost of goods sold first and the closing stock reflects goods that are purchased later. In rising prices, replacement is at a higher price than the assumed cost. This method does not reflect current prices, and replacement will be understated.
- **Last in first out (LIFO).** This is the reverse of FIFO here the newest (last) item in stock is the first sold. In rising prices, replacement is at the current price. In a falling price market existing inventory is overvalued.
- **Average cost.** This method assumes an average of all prices paid for the article. The problem with this method in changing prices (rising or falling) is that the cost used is not related to the actual cost.
- **Standard cost.** This method uses cost determined before production begins. The cost includes direct material, direct labor, and overhead. Any difference between the standard cost and actual cost is stated as a variance.

2.13 Placing order for Inventory

The rational for inventory management is to provide a service to meet customers demand. Customers can be served only when there is a stock of inventory. As inventory is demanded at a stated interval, the stock will eventually run out. When the minimum stock is reached, a reorder process is initiated. The basic question to be answered is how much is to be ordered?

Arnold et al (2008) proposes the following to be ordered:

- **Lot-for-lot.** The lot-for-lot rule says to order only what is required. The order quantity changes whenever requirements change. This technique requires time-phased information such as provided by a material requirements plan or a master production schedule. Since items are ordered only when needed, this system creates no unused lot-size inventory.

- **Fixed-order quantity.** Fixed-order quantity rules require a fixed unit is ordered each time an order is placed for the material.
- **Min-max system.** In this system, a new order must be raised when the quantity in stock fall below order point. The quantity ordered is the difference between the actual quantity available at the time of order and the maximum.
- **Order n periods supply.** Rather than ordering a fixed quantity, what is needed within a period is what is actually ordered to satisfy future demand.

M. Receipt of Materials

Stock receipt involves all materials and items supplied to the store or warehouse from either internal or external sources. It is not unusual to find out that materials are sometimes sent to the wrong organization and thus it is very essential to find out if the goods are at the right delivery point and also ascertain whether the materials are the correct one requested. According to Lambert et al (1998), 'receiving activities include the real lifting of materials from the transport mode used, recording into warehouse material books, inspection for damages, and verification of goods against order and transport record details'. Inventory receiving involves all materials supplied from outside suppliers, production, unit, other departments, and other storehouse within the organization. The receipt of materials into a warehouse or stores must be a dutifully organized activity. Inventories may be transported into the stores by hand, post, road, and rail or by air Rushton et al (2006), 'in most large warehouses, incoming vehicle loads are notified in advance for the necessary activity needed to be set in motion before arrival. On arrival, inventory staffs check documentations of vehicle before actual unloading is affected. Documents involved in receipt of goods as put forward by Jessop and Morrison (1994) include copy order, carrier consignment note, supplier advice note, delivery note, supplier package note as well as goods receive note.

N. Coding of Materials

The usual way of describing materials in the store or warehouse is through simple description, however many names exist for the same item and at such there is the need to have some logical basis of identification that is less cumbersome and more precise. The best way to identify materials in stock is through coding. Lyson, (2000) states that coding helps in making location of materials in storehouse easy, promote standardization, reduce variety, help avoidance of duplication, simplicity in avoiding long and detailed item description and reduce cost as it assist accuracy in identification and error avoidance. Jessop and Morrison (1994) states that coding methods includes firstly doing it by the nature of the item or by a consideration of the item own inherent characteristics whereby similar items are collated into groups like raw materials, tools and bought out parts and further sub dividing this group as far as the circumstance require and secondly coding by the end use where code are arranged to meet the purpose for which the item will be used. This method is suitable for identifying materials and equipment in the armed forces and hospitals. Whatever method of coding is employed, symbols used are normally alphabetical, numerical, or a combination of alpha-numerical.

O. Stock Records

Stock keeping and transaction records and reports of consumption and stock holding contain valuable information for the management of health commodities. This is necessary for accounting purposes of funds allocated for inventories. Original forms and their copy must be kept in a manner that makes them easily accessible for routine reference. The aim is to keep bin cards on shelf with commodities, establish and maintain a filing system for all stock and to keep all ledgers up to date. (Standard operating procedure of GHS, 2008). The system of recording in most organizations is the manual system, computerized system or a combination of both the manual system and the computerized system. According to Jessop and Morrison (1994), the manual system employs stock control cards to keep details of stock movement. Every item must have a stock card that is divided into a basic five columns for date, receipt, issue, unit price and balance. Information on the stock card includes location number, stock balance quantity, date and unit of issue, method of delivery, code number and remarks. The computer system on the other hand involves computer software designed to store, recall information and make calculation. Records control using the computerized system is easy, fast and more accurate than the manual system.

P. Storage

According to Muller (2003), 'every company must have some space set aside for storage of materials'. Materials or documents may be stored permanently or temporarily, long time or for a short time. Because supply and demand cannot be met perfectly, materials must be stored for future use. Quayles (2006) storage entails safety keeping and material handling of materials, WIP, parts, components, and finished good. Materials must not be left on the floor but must be protected from damage, or theft, and deterioration. Storage of materials must be done on suitable equipment.

Q. Storage Equipment.

There are many equipment used for storage of inventory.

- **Shelving** – Shelves is made up of different height, size, space and depth. Some shelves have sub dividers and it is used for storing smaller items. Shelves can be placed on the floor, or fixed on the sides of walls.
- **Bins.** Bins are made from materials like galvanized steel, wire mesh and fiberboard and come in multiple sizes and shapes.
- **Drawer units.** Drawer may be fused into shelves, counters and tables and used as safe to secure materials.
- **Carousels.** They are electric driven storage that rotate until the needed is directly in front of the inventory staff and can be vertical, horizontal or conical. Rushton et al (2006).

R. Inventory Issue

The term 'issue' is defined by Lowe (2002) as an express approval for the withdrawal of an item in storage. To issue out materials from the stores, the user must first determine the item they need specifying the quantities. The user then fills a requisition forms giving the details of items requested and get authorized personnel to approve the request before submitting it to the warehouse or store for the needed item(s) to be issued out. The warehouse or store personnel on receipt of the authorized voucher first check the authenticity of the authorization, identify the item(s) by the code number, select it and prepare stores issue voucher to the requisitioner to sign and afterwards hand over the item(s) to the person who made the requisition. Jessop and Morrison (1994), stress that issues must correspond with the needs of the organization. Some of the commonly used methods are issue on request and scheduled routine issue to production. The documents used in issues include the store issue voucher and store requisition voucher.

S. Stock Taking

Stock taking is the periodic manual count of inventory in stock to determine if actual goods on hand are the same as what is recorded. During stock taking, materials are measured, counted, weighed and checked. According to waters (2003), 'the difference between physical and recorded balance must be close enough. To help unravel weakness in the system, check stock accuracy and disclose the possibility of theft, fraud as well as loss, stock taking should be done at least once every three month. At the health facility, stocktaking exercise should be done monthly to coincide with the monthly requisition. (Standard operating procedure of GHS, 2008). A discrepancy exists if the stock found by the physical examination does not agree with the balance on the stock card Jessop and Morrison (1994). There is surplus if stock found exceeds the recorded figure and a deficiency if the stock found is less than the recorded figure. Discrepancy may come about due to error in simple additions and subtracting while posting, pilfering, issue of incorrect quantity, posting done on wrong card and incoming materials place in bin but material return card not yet updated.

T. Inventory Security

Store security should be of prime concern to all organization that operates inventory. Inventory security must not only cover fraud, theft, and pilfering, but must also cover damage, deterioration, and obsolescence. Organizations may hire specialize security personnel to guard against theft or inventory staff are made responsible for inventory security. The following may be implemented to secure the inventory:

- Appointment of senior manager with overall responsibility for inventory security
- Regular allocation of budget to cover cost of security.
- Regular discussion of inventory security at managerial level meetings
- Duplicate keys should be kept to a minimum for adequate control.
- Store manager must be responsible for all keys and locks of inventory house.
- All keys should be numbered to match keys to correct.

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U. Warehouse

Blanchard (2007) Warehousing plays a key role through product storing, loading products onto a truck to final destination, and returns, which is reverse logistics process. Warehouse keep materials, WIP and finished goods and serve as the next point in fulfilling the next customer need in the supply network. Sadler (2007), the main function of a warehouse is for faster access to vitally needed goods. This is achieved by receiving goods in bulk and sorting them into customers' exact requirements. The objective of a warehouse according Arnold et al (2008) is to greatly reduce cost and increase customer service. These warehouse objectives is achieved through the provision of timely customer service, tracking items to ensure that they can be found readily when needed, minimizing the total physical effort and the cost of moving goods into and out of storage, and the provision of a secure communication links with customers.

V. Types of Warehouse.

According to Lambert et al (1998), there are many alternatives to own and operate a warehouse. The major types of warehouse are:

- Public warehouse. The public warehouse is meant for the general public. It renders services to the public for the payment of rent for the purpose of the commerce.
- Private Warehouse. This warehouse solely belongs to a private individual or an entity for the exclusive storage of their products.
- Bonded Warehouses. It is warehouse that stores imported goods for which the payment of custom duties is not yet paid and the owner need permission before he can interfere with them.
- Government Warehouse. This is a warehouse owned by the government
- Contract Warehouse. A contract warehouse is a variation of public warehouse between the user of a warehouse and the provider of the facility. Contract warehouse offer unique and exclusive service to one client where vendor and client associated risk with the operation of the warehouse with a focus on productivity, risk, service and efficiency.

W. Challenges of inventory management

Players in downstream distribution channels involve in wholesalers and retailers who face the challenge of not being able to satisfy customers because of incorrect forecast demand, irregular customer expectation and non-availability of products. According to Coyle et al., (2003), the challenge is becoming bigger each day due to products inherent characteristics such as substitutes. Customer's order could be cumbersome, and in various categories and can become complex and time-consuming. Forecasting demand cannot be expertly done naturally and this creates two extreme challenges: overstocking and under stocking of inventory. There is a tendency to overstock because companies always tend to naturally avoid stock out situation. Overstocking brings to the fore the incidence of theft, pilfering, breakages/damages and materials expiring in storage. Under-stocking on the other hand leads to the tendency to stock-out of inventory and reduces the profit margin due to lost sales.

X. Conceptual Framework of the Study

According to Langabeer II and James (2008), Healthcare operations management can be defined as a discipline that integrates scientific principles of management to determine the most efficient and optimal methods to support patient care delivery. Operations management utilizes processes and decisions with the aim of addressing costs, process, technology and productivity. The study uses the improvement of inventory management as an activity related to the hospital operations in healthcare delivery. It is worthy to note that inventory management in hospitals constitute a part of hospital operations, it does not include activities such as manufacturing and production scheduling. It starts with procurement through to storage and the distribution of orders received to various hospital units for the purposes of efficient health service delivery. Many hospitals do not manufacture their own drug and non-drug consumables in Ghana. Procurement compensates a cost reduction strategy in hospitals where it is not uncommon to outsource materials which are not within their core competences. Storage as an inventory management function in hospital operation is very important because of the perishable nature of drug commodities and the complexity involved compared with other industries. Hani et al., (2010) argues that a limitation of physician's knowledge as top management persons and their duly involvement in decisions making regarding inventory management is a wrong move. This is highly evident in Ghana hospitals. Another factor is regulation pressures from government and other

institutions. It is a very big influence in the pharmaceutical industries in their day to day activities. Storage means keeping goods for future use. For this study the term refers to the safe keeping of materials and drug products in drug stores, pharmacies, hospitals etc., under the specified conditions. The storage conditions are the conditions specified for the product. They include temperature, humidity, container etc. The most important stability for drugs is their storage systems. The storage temperature requirements for drugs specify the following; Refrigerator is a cold place providing a temperature between (usually 2° to 8°C/36° to 46°F), cold place is a storage condition with temperature not exceeding 8°C, cool place specifies a temperature 8°C to 15°C, room temperature is between 15°C to 30 °C, and cold room is artificially cooled area with a regulated temperature of 12 °C to 15 °C. These instructions are substantive enough to store medicines. Distribution of hospital consumables plays a critical role in inventory management. Distribution and disposal has to do with timely provision of materials for effective service delivery. Any drug distribution system is meant to reduce the incidence of medication errors. Medication error refers to a difference between prescribed medication and what is administered. In Ghana, the distribution takes three modes depending on the location and size of the hospital within its business area. In Ghana, the locality to a large extent describes the distribution mode. The distribution mode can take the form of a conventional system where there is a central pharmacy store in every hospital that decides what and how to buy. This is the most common system. It can also be a centralized managing of drugs and non-drug commodities in a district or regional center. In other areas distribution is in the form of a third party or logistic operator who receives the drugs and non-drug commodities through physical flow. Thereafter the decisions of how and what to order is determined by the hospital' supply chain manager in consultation with the pharmacy. The non-drug commodities have a longer life expectancy and its demand is not incessant compared to the drug commodities. The drug commodities usually go to the wards or other hospital units through dosage. According to Negele (1994), direct dosages to hospital units through drug movement includes shortages of nursing staff and the desire to reduce risk, reduce cost and also increase pharmacist involvement with drug therapy. In line with the reasoning above, the conceptual framework below is proposed.

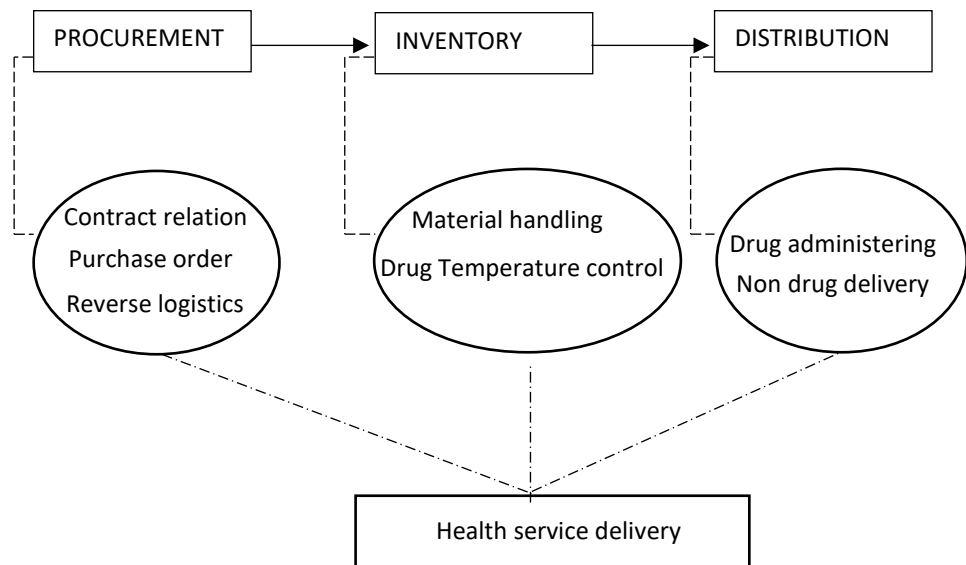


Figure 2.1 conceptual framework
Source; Researcher's construct (2016)

The conceptual framework depicts key inventory management practices in Ghana hospitals. It is contended in a few extant literature that whilst procurement used to be a staff function, contemporary studies have shown that it is foremost and when procurement is wrong it affects all other inventory procedures. Storage basically deals with the handling of non-drug commodities as well as a precautionary temperature control mechanisms that keeps perishable drugs for prolong use. Distribution has the rudimentary function of administering drug to various units in hospitals and the delivery of non-drug commodities when needed. These key inventory practices impact significantly on health service delivery.

Y. Summary

Inventory management is the life system needed for continuous operation in all businesses inventory can be compared to the blood of the human body. Just as used up red and white blood cells need replenishment in the body for life sustenance, so too is the replenishment of used inventory vital to ensure continuous operation in any organization.

III. METHODOLOGY

This chapter looked at the research methodology employed to achieve the objectives of the study. Kothari (2004), Research methodology is a practical way of finding solution to a research problem. It is a scientific way of understanding how research is done by unraveling the systematic steps employed by a researcher in confronting research problem to expose the logic behind them. Research methodology is thus used to find out, explain and compare truth or otherwise relating to a subject so as to prove, disprove, or add the existing knowledge available on the subject matter. Research methodology denotes the process of arriving at the most dependable solution to a problem by providing a well-planned systematic gathering, analysis, and interpretation of data. This chapter looked at the methodology used to ensure that the objectives of the study is met focusing on the research design, research approach, research strategy ,population, sampling and sampling procedures, data collection, basis of data analysis, data validity and reliability, and a profile of the New Edubiase Government Hospital.

A. Research Design

According to De Vaus, (2001), the three main research approaches that can be adopted for a research study are qualitative, quantitative and mixed approach. The mixed method combining the two approaches was used for this research. The selected strategy used in this research was arrived at by considering the type of research questions posed. This study employed a case study because the research is accessing a scenario within the context of a real life situation. The study mostly used of quantitative technique but qualitative technique was also used as well and data was gathered from multiple sources. Data collection instruments used includes questionnaires, and observation.

B. Research Approach

This research used triangulation approach combining both the qualitative and quantitative methods of data collection because of the limitations of every method. The researcher was of the firm belief that the different approaches will complement each other. The research started with informal observation of inventory processes of the hospital before questionnaire was adopted to measure the impact of inventory management in service delivery with the aim of carry out statistical analysis.

C. Research Strategy

The main research strategy for this work was a case study that conducted in NEGH. The investigator attempted to identify logistic problems in NEGH so as to propose a system approach to correct such problems identified. In order to understand and describe the inventory control at NEGH and recommend improvements, the whole system was taken into consideration. It is not possible to just study every separate part and analyze them separately without interference from connected activities. How people act and behave, within the different parts of the inventory channel and control was examined to determine how inventory control is managed to achieve desired results. The aim of this thesis is to investigate how inventory management impacts on service delivery, and therefore the most suitable strategy for this thesis is the systems approach since many different parts and activities are analyzed both separately and as a system to find a better way to manipulate inventory to impact positively on service delivery at NEGH.

D. Population for the Study

The entire workforce of the NEGH constituted the population made up of one hundred and fifty-seven (157) workers from fifteen (15) units within the hospital aside the store unit for the study. The target group included workers who are directly linked to the management of inventories such as management of the hospital, stores personals, and the end users within the hospital.

E. Sampling and Sampling procedures

The project was conducted using use the entire workers of the NEGH as it sampling frame. A sampling frame is defined by Given (2008) as “the individual elements within population who have the opportunity to be included in a

given sample". NEGH hospital has five (5) core management members who operate as managers of the hospital, and the store staff strength is ten (10) personnel with the rest of the workers as end users of the store function. A sample size of One hundred and twenty (120) respondents was used for this study. The sample size comprised of the five (5) core management members of the hospital, all ten (10) store personnel and forty-five (105) end users from the various unit with three (3) respondents selected from each of the fifteen (15) units. This sample size in the opinion of the researcher will yield a holistic overview of information for the appraisal of the hospitals inventory management practice as proposed by Krejcie and Morgan (1970). According to Krejcie and Morgan (1970), the need for a representative statistical sample in empirical research has created a demand for an effective method to be used in determining the optimal sample size in any research work. They proposed a formula for determining sample size for known and unknown population and according to their table for a sample size in a known population, a sample size of 113 for a population of 160 is adequate representation of that population. Stratified sampling method is used to select respondents from the 15 units of the NEGH. Stratified sampling is preferred by the researcher because it eliminates the influence of bias in the selection of respondents. Kothari (2004), "stratified sampling method is mostly adopted when population within which the sample which is to be drawn is not homogeneous to obtain a representative sample". Stratified random sampling is a simple systematic random sampling, obtained when the population is divided into a number of sub groups called strata and a simple sample is drawn from each stratum. In order to obtain the sample size, all workers name in each unit was assign a number and the numbers from each department are then put into a separate bowl. An assistant was blindfolded and asked to pick 105 workers with 7 from each of the 15 unit within the hospital and used as a sample for this study. The 105 workers from the various units was added to the 10 store staffs and 5 core management members to add up to 120 respondents to be used as sample size for this work.

F. Procedure for Data Collection

This project used of both primary and secondary methods of data collection. The researcher refer to various publications including books, journals, articles, newspapers, reports obtained from libraries, NEGH, and the internet on the subject matter to explore added information to help in providing answers the questions set in the problem definition. The primary data was collected through a number of visits to the study area where personnel were interviewed and questionnaires administered. The questionnaires employed the use of the likert scale technique. According to Kothari (2004), "in a Likert scale, the respondent is asked to respond to each of the statements in terms of several degrees, usually five degrees (but at times 3 or 7 may also be used) of agreement or disagreement. Each point on the scale is assign a mark score. Answers with the lowest acceptance level is the least score (say 1) and the highest acceptance level is given the highest score (say 5)". Kothari (2004) further state that "the Likert-type scale is simple to construct, highly acceptable because under it, respondents answer each statement in the instrument, and it takes much less time to construct and answer". As a means of obtaining more information on the topic, the researcher used observation method of data collection.

G. Method of Data Analysis

The data collected from the primary sources were edited to select the relevant data for the purpose of this study. Responses from the respondents were presented and analyzed in a simplified form. Statistical techniques used to analyze the data included simple tables, percentages, pie chart, and bar graph using SPSS because these statistical techniques are simple and easy to understand.

H. Data Validity and Reliability

Dawson (2007), in every quantitative data analysis, validity and reliability are paramount. Quantitative researchers strive to prove that their chosen method measures exactly what they intent to measure. They strive to ensure that their measurements are dependable and consistent to eliminate errors or bias, either from the respondents or from the researcher. A good research work must have a high degree of reliability and should also pass the validity test. Given (2008) "In research, validity is basically goodness or acceptability of a study whereas reliability is the dependability, consistency, and/or repeatability of a project's data collection, interpretation, and/or analysis". Reliability is also where a research instrument yield the same or similar results when it is used in another environment under the same condition and validity refers to a situation when research instrument measure what it is intended to record. To ensure validity, all questionnaires were self-administered to the right persons within the case study organization by the researcher and

only data that was collected was analyzed. Questionnaires were pre-tested on a few selected respondents before they were finally administered to test for reliability.

I. Profile of New Edubiase Government Hospital

The New Edubiase Government Hospital is located at New Edubiase, the Capital of Adansi South District of the Ashanti Region. “The Hospital is located on the Bekwai-Yamoransa trunk road. The Hospital started as a Maternity Home in 1986 with a staff strength of four (4). Through the initiative of Nana Edubiase – Nana Asiamah Guahyia, the facility was changed from a maternity home to a Health post in 1988 when the Government built five residential blocks and an OPD. On 21st June, 1988 Dr. Seth M. Ayi, the first Medical officer of the hospital assumed duty in the facility. The District Director in Obuasi posted enrolled nurse, one Medical Records Assistant, one Dispensing Assistant and an Accounts officer. The facility was elevated to Health Centre in 1992 with a lot of challenges. No wards as well as beds for in-patients. Benches were used for detained patients and patients on admission. In 1996, a second Medical officer Dr. Okyere Nyantakyi Ntori was posted to the facility. He took over from Dr. Ayi who became the District Director of Health Service. Under the initiative of Mrs. Theresa Joyce Baffoe MP for New Edubiase, the facility was nominated for upgrade into a District hospital. The project which started in November, 2002 was completed in 2004. As a result of its strategic location, the facility receives clients from some parts of Eastern and Central Regions of the country. It is also a referral point for all facilities in and around the Adansi North and South Districts of the Ashanti Region. The Hospital provides the following services; Out-patient services, In-patient services, Laboratory services, Emergency / Casualty Services, surgical Operations, Radiology, Eye care services, ENT services, Dental, Reproductive and Child Health services, Pharmaceutical and Mortuary services. Currently the hospital has sixty (62) bed capacity, with a daily average OPD attendance of about one hundred and fifty-eight (158) clients. The hospital has staff strength of 157 out which 115 are permanent and 42 casual workers. The hospital renders 24 hours services The vision is to be the best District hospital in Ashanti Region and beyond and the mission is to provide cost effective quality, holistic and evidence based primary care to clients in a humane and ethical manner, ensuring clinical excellence, administrative and managerial excellence, and community and stakeholder engagement in furtherance of public health in Adansi South”.

(Hospital report 2014, pg 2-5).

J. Organizational Structure

The hospital has an organizational structure with the Board at the top. The Medical Superintendent has four (4) core managers who report to him on both clinical and administrative issues. The Medical Officer report directly to the Medical Superintendent but he is not a core Management member. Stores report to the Medical Superintendent through the Administrator.

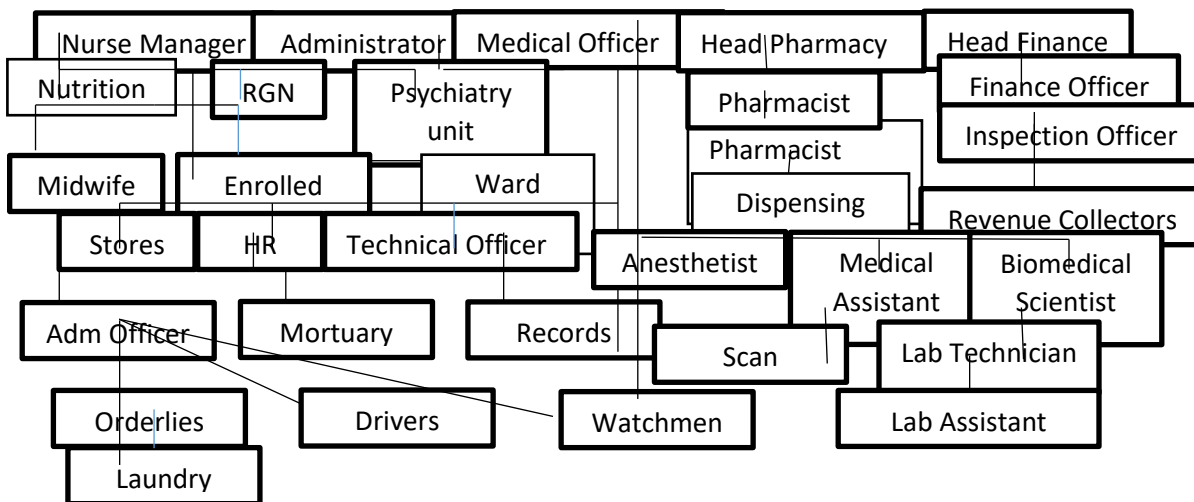


Fig 3.1 Organizational structure of NEGH

IV. DATA PRESENTATION AND ANALYSIS

This chapter deals with the presentation and analysis of data gathered from the New Edubiase Government Hospital on the performance of inventory management practices. Below are the results of the survey questionnaires administered and collected.

A. Background of Respondents

A total of one hundred and eighteen (118) respondents from the hospital who were fully and partially involved in the management of inventory management practices in the hospital were administered with questionnaires. They include 10 store staff, 5 core management members, and 105 end-users. With the exception of the end-users where 103 questionnaires were answered and returned, all other set of questionnaires administered to the store staff and core management yielded 100% response rate. The total response rate of the questionnaire administration was 98%. This shows willingness and support of respondents to make this work highly successful.

Table 4.1.1 Gender Distribution of Respondents

| GENDER | FREQUENCY | PERCENTAGE (%) |
|--------------|------------|----------------|
| MALE | 52 | 44.07 |
| FEMALE | 66 | 55.93 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

i. Gender Distribution of Respondents

Question 1 concerns the gender of respondents. The reason was to ascertain whether there was gender balance in inventory practice activities. Interesting, all 59 respondents answered this questions, which signaled enthusiasms and excitements to participate and help make this project a success. From the frequency table representing gender of respondents above, it was established that the female workers dominates inventory practice activities at New Edubiase Government Hospital representing 55.93% of respondents as compared to the male workforce that represented 44.07% of respondents. This means that there was gender balance as far as inventory management practices is concerned in the health service delivery in Ghana considering the fact that majority of nurses are female.

Table 4.1.2 Age of Respondents

| AGE (YEARS) | FREQUENCY | PERCENTAGE (%) |
|--------------|------------|----------------|
| BELOW 25 | 24 | 20.34 |
| 26-35 | 56 | 47.46 |
| 36-45 | 30 | 25.42 |
| 46-55 | 6 | 5.08 |
| ABOVE 56 | 2 | 1.70 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

ii. Age of Respondents

Question 2 seeks to determine the possible age of respondents. Out of a total of 59 responses obtained, 20.34% of respondents are below 25 years, 47.4% of the respondents were between 26 to 35 years old, 25.42 % of respondents were aged between 36 to 45 years. 5.08% of the respondents were aged between 46 to 55 years while 1.70% were aged above 56 years old. This means there is experience, and fresh up and coming staff handling inventory management at New Edubiase Hospital.

Table 4.1.3 Educational Qualification of Respondents

| EDUCATION | FREQUENCY | PERCENTAGE (%) |
|---------------|------------|----------------|
| OTHERS | 54 | 45.76 |
| HND | 34 | 28.81 |
| BACHELORS | 20 | 16.95 |
| POST GRADUATE | 10 | 8.48 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

iii. Educational Qualification of Respondents

Question 3 inquired about the educational level of respondents involved in inventory operations. 45.76% of respondents were having other certificates, 28.81% of respondents were HND holders, 16.95% of respondents were Bachelor holders, and 8.48% of respondents were Post Graduate holders. This shows that more qualified personnel were involved in inventory Operations as required to meet the sensitive treatment it deserves.

Table 4.1.4 Work Experience of Respondents

| EXPERIENCE (YEARS) | FREQUENCY | PERCENTAGE (%) |
|--------------------|------------|----------------|
| BELOW 1 | 28 | 23.73 |
| 1-5 | 54 | 45.76 |
| 6-10 | 22 | 18.64 |
| 11-15 | 10 | 8.47 |
| 16-20 | 2 | 1.70 |
| ABOVE 21 | 2 | 1.70 |
| | 118 | 100 |

Source: Field survey, July, 2016

iv. Work Experience of Respondents

Question 4 inquired about the work experience of respondents. 23.73% of respondents have work experience below 1 year, 45.76% of respondents have experience between 1 to 5 years, and 18.64% of respondents have experience between 6 to 10 years while 8.47%, 1.70%, and 1.70% of respondents' experiences correspond to 11 to 15, 16 to 20 and above 21 years respectively. This shows that workers understand what is expected of them in inventory management.

Table 4.1.5 Unit Where Respondents Work

| UNIT | FREQUENCY | PERCENTAGE (%) |
|----------------|------------|----------------|
| MANAGEMENT | 5 | 4.24 |
| STORES | 10 | 8.47 |
| ADMINISTRATION | 7 | 5.93 |
| PHARMACY | 7 | 5.93 |
| LABORATORY | 6 | 5.09 |
| OTHERS | 83 | 70.34 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

v. Units Where Respondents Work

Question 5 asked respondents to state the unit within which they work within the hospital. The aim was to ascertain whether all units in the hospital know about inventory management practices. 4.24% of responses are management

members, 8.47% of responses are store staff, and 5.93% of responses come from Administration. .5.93% comes from pharmacy, 5.09 % from laboratory and 70.34% from other units within the hospital.

B. Inventory Management Practice

Inventory consumables are procured through the stores through a formal procedure laid down by the Public Procurement Act. The Medical Superintendent is the head of procurement. It was revealed that the hospital inventory is managed by the store-keeper and the procedures for initiating inventory replenishment are usually done through procurement meetings and memo writing.

Table 4.2.1 Distribution of responses to determine if inventory is procured at a monthly or quarterly interval

| RESPONSE | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 64 | 54.24 |
| AGREE | 52 | 44.07 |
| NEUTRAL | 2 | 1.69 |
| DISAGREE | | |
| STRONGLY DISAGREE | | |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

i. Distribution of responses to determine if inventory is procured at a monthly or quarterly interval

The above table shows that 54.24% of respondents strongly agree that inventory is replenished at a monthly interval while 44.07% are also in agreement to the fact that inventory is replenished at a monthly interval. 1.69% of respondents however do not know the replenishment pattern of the hospital. This question is meant to uncover whether replenishment of inventory is planned so that procurement is large enough to attract manufacturer and wholesalers of consumables used by the hospital. This will open avenue for both quantity and cash discount as well as credit sales.

Table 4.2.2 Distribution of responses to determine if invoices and waybill accompany procured inventory

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 30 | 25.42 |
| AGREE | 88 | 74.58 |
| NEUTRAL | | |
| DISAGREE | | |
| STRONGLY DISAGREE | | |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

ii. Distribution of responses to determine if invoices and waybill accompany procured inventory

Question two asked respondent whether invoices and waybill accompany procured inventory from suppliers. These documents will serve as evidence of goods supplied to the hospital to facilitate future payment of the said goods. 25.42% of respondents strongly agree and 74.58% of the respondents agreed. It is clear from the above responses that invoices and waybill accompany procured goods meant for the hospital.

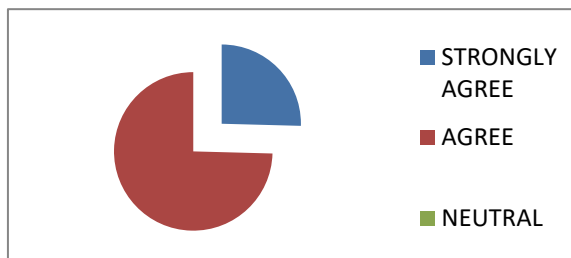


Fig 4.1 a pie chart showing responses to whether waybill and invoices accompany procured inventory.

Table 4.2.3 Distribution of Responses to determine if Procured Goods are inspected before Moving into the Stores

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 44 | 37.29 |
| AGREE | 74 | 62.71 |
| NEUTRAL | | |
| DISAGREE | | |
| STRONGLY DISAGREE | | |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

iii. Distribution of Responses to determine if Procured Goods are Inspected Before Moving into the Stores

Question 3 was to investigate if the hospital has a well-functioning inspection team in place to inspect incoming goods for quantity, quality, damages and breakages. 37.29% of respondents strongly agreed while 62.71% also agree that the inspection team inspect and verify incoming consignments before they are handed over to store staffs.

Table 4.2.4 Distribution of Responses to determine if Approval is Sought before Procurement is Done

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 38 | 32.20 |
| AGREE | 70 | 59.32 |
| NEUTRAL | 10 | 8.48 |
| DISAGREE | | |
| STRONGLY DISAGREE | | |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

iv. Distribution of Responses to determine if Approval is Sought Before Procurement is Done

Question 4 investigated to bring to the fore if approval is sought before procurement is done. The aim was to establish that all procurement done is backed by management as anything done without management support is likely to fail. Responses shows that 32.20% strongly agree, 59.32% agree that management approval is always sought before procurement is done. 8.48% however do not know whether management approval is sought before procurement is done.

Table 4.2.5 Distribution of Responses to determine if Materials Ordered are Received in Time

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 4 | 3.39 |
| AGREE | 10 | 8.48 |
| NEUTRAL | 16 | 13.56 |
| DISAGREE | 40 | 33.90 |
| STRONGLY DISAGREE | 48 | 40.67 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

v. **Distribution of Responses to determine if Materials Ordered are Received in Time.**

Question 5 sought to find out if materials ordered from suppliers are received on time. This is because effective service delivery is dependent on timely availability of inputs. 3.39% of respondents strongly agreed, 8.48% agreed, 13.56% choose to remain neutral. 33.90% of the respondents disagree and 40.67% strongly disagreed. It is clearly evident that ordered materials from suppliers are always supplied late.

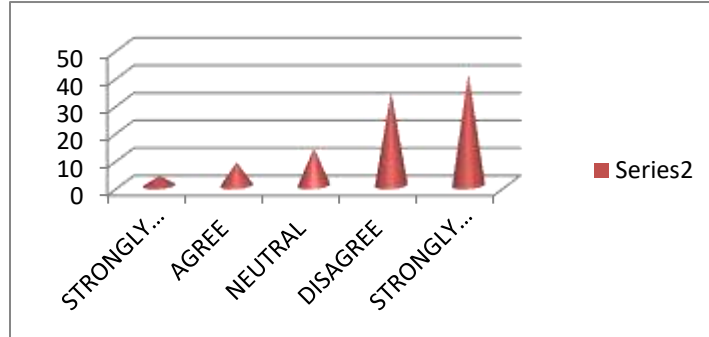


Fig 4.2 a bar graph showing responses to determine if Materials Ordered is received in Time.

Table 4.2.6 Distribution of Responses to determine if Ledgers and Other Records are updated promptly

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 2 | 1.69 |
| AGREE | 30 | 25.42 |
| NEUTRAL | 26 | 22.03 |
| DISAGREE | 48 | 40.67 |
| STRONGLY DISAGREE | 12 | 10.20 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

vi. **Distribution of Responses to determine if Ledgers and Other Records are updated promptly**

Question 6 asked respondent if ledgers and other records are updated promptly upon receipt of materials from suppliers. Responses from respondents indicate that 1.69% strongly agrees, 25.42% agree, 22.03% remain neutral. 40.67% disagree, and 10.20% strongly disagree. The responses is an indication that ledger and other records are not updated promptly upon receipt of materials from suppliers.

Fig 4.3 a bar chart showing Responses to determine if Ledgers and Other Records are updated promptly

Table 4.2.7 Distribution of Responses to determine if Emergency order are given Special Attention.

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 20 | 16.95 |
| AGREE | 28 | 23.73 |
| NEUTRAL | 50 | 42.37 |
| DISAGREE | 16 | 13.56 |
| STRONGLY DISAGREE | 4 | 3.39 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

vii. Distribution of Responses to determine if Emergency orders are given Special Attention

The next question seeks to elicit responses against the background that emergency orders are given special attention. This question is necessary because the ultimate goal of inventory is to improve service delivery and save lives of patients. 16.95% of respondents strongly agreed, 23.73% agreed, 42.37% remain neutral, 13.56% disagreed, and 3.39% disagreed. Responses indicated that even though special attention is given to emergency orders, there is still more room for improvement

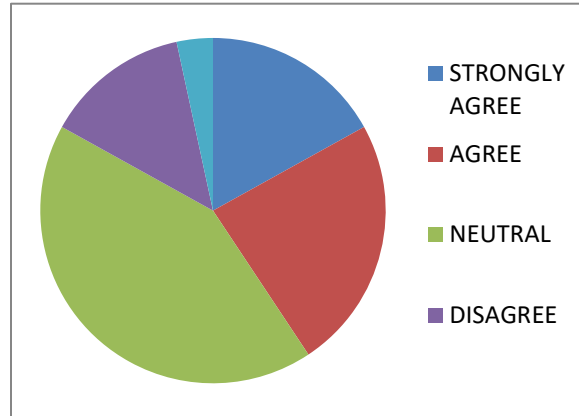


Fig 4.4 a pic chart showing responses to determine if Emergency order are given Special Attention

C. Inventory Management Efficiency

In seeking answers to inventory management efficiency in the hospital, questions posed included; the hospital having a warehouse or store at the hospital, storage being large to accommodate all items, store having shelves, racks and pallets to house stock items, good lightening and security systems, and special storage mediums for items requiring special storage conditions. In all the questions posed, respondents were instructed to indicate their preferred option for each statement by ticking (x) in the right column on the 5 likert scale where 1= Strongly Agree, 2=Agree, 3=Neutral, 4= Disagree, and 5=strongly disagree. The table below is the result of respondents' answers in percentages.

Table 4.3.1 Distribution of Responses to determine if there is a Warehouse/Store at the hospital

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 70 | 59.32 |
| AGREE | 38 | 32.20 |
| NEUTRAL | | |
| DISAGREE | 10 | 8.48 |
| STRONGLY DISAGREE | | |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

i. Distribution of Responses to determine if there is a Warehouse/Store at the hospital.

Consumables bought from suppliers must be stores at a warehouse since consumption cannot be exactly synchronized with delivery. This question was to find out if the hospital has a place to store materials bought from consumers. 59.32% of respondents strongly agreed, 32.20% agreed and 4.48% disagreed. The above responses show that the hospital has a warehouse/store house. Observation revealed that the hospital has a store house and an office for the store staff.

Table 4.3.2 Distribution of Responses to determine if the Store serves Multipurpose Task

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|----------------|-----------|----------------|
| STRONGLY AGREE | 40 | 33.90 |
| AGREE | 64 | 54.24 |
| NEUTRAL | 14 | 11.86 |
| DISAGREE | | |

| | | |
|-------------------|------------|------------|
| STRONGLY DISAGREE | | |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

ii. Distribution of Responses to determine if the Store serves Multipurpose Task

Question 9 was to investigate if the stores serve multipurpose task such as receipt and dispatch bay. This is very important to reduce incidence of pilfering where unauthorized staff gain entry into restricted areas within the stores. Responses shows that 33.90% of respondents strongly agree, 54.24% agree, and 11.86% remained neutral.

Table 4.3.3 Distribution of Responses to determine if the Stores is large to accommodate all items needed to serve the hospital.

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 36 | 30.51 |
| AGREE | 54 | 45.76 |
| NEUTRAL | 12 | 10.17 |
| DISAGREE | 16 | 13.56 |
| STRONGLY DISAGREE | | |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

iii. Distribution of Responses to determine if the Stores is large to accommodate all items needed to serve the hospital

Question 10 asks respondents to answer if the store is large enough to accommodate all materials bought by the hospital. This is to ensure that all materials are under lock and key and properly secured to prevent theft. 30.51% strongly agreed, 45.76% agreed, 10.17% remain neutral and 13.56% disagree.

Table 4.3.4 Distribution of Responses to determine if the Stores have Racks, Shelves, and Pallets

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 36 | 30.51 |
| AGREE | 54 | 45.76 |
| NEUTRAL | 12 | 10.17 |
| DISAGREE | 16 | 13.56 |
| STRONGLY DISAGREE | | |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

iv. Distribution of Responses to determine if the Stores have Racks, Shelves, and Pallets

The next question asks respondents to either agree or disagree whether the stores have racks, shelves, and pallets on which to store items. Pallets and shelves protect materials from damage and also facilitate easy storage and retrieval of stored goods. It also prevents accidents and injuries. Respondents' answers agree to this question with 30.51% strongly agreeing, 45.76% agree, 10.17% remain neutral and 13.56% disagree. The investigator was shown round the storeroom and can confirm that the stores have pallets, and shelves on which items have been stores.

Fig 4.5 a pie chart showing responses to determine if the Stores have Racks, Shelves, and Pallets

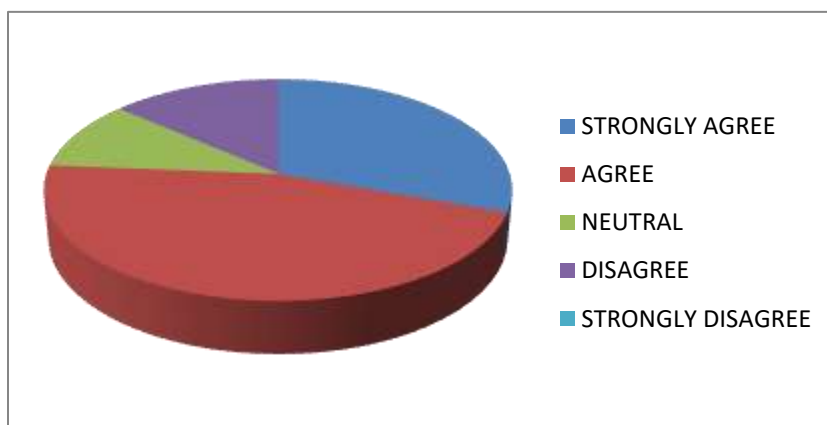


Table 4.3.5 Distribution of Responses to determine if the Stores have good Lightening and Security

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 34 | 28.81 |
| AGREE | 40 | 33.89 |
| NEUTRAL | 24 | 20.34 |
| DISAGREE | 14 | 11.86 |
| STRONGLY DISAGREE | 6 | 5.10 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

v. *Distribution of Responses to determine if the Stores have good Lightening and Security.*

Question 12 seeks to find out if the stores have good lighting system and adequate security. Good lightening helps in preventing injuries and also help in faster identification and retrieval of items in the store whiles good security prevent theft. Answers provided indicated that 28.81% strongly agree, 33.89% agree, 20.34% choose to remain neutral, 11.86% disagree and 5.10% strongly disagree. A look around the stores by the researcher reveals that there is adequate lightening in the storeroom and the locks and keys to the store is in good condition.

Table 4.3.6 Distribution of Responses to determine if the Stores have Special Storage Equipment for items requiring Special Storage Condition

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 44 | 37.29 |
| AGREE | 52 | 44.07 |
| NEUTRAL | 22 | 18.64 |
| DISAGREE | | |
| STRONGLY DISAGREE | | |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

vi. *Distribution of Responses to determine if the Stores have Special Storage Equipment for items requiring Special Storage Condition*

Question 13 seeks to determine if the stores have special storage equipment for the storage of specialized items. Specialized items like some laboratory reagents, blood and some medical consumables require special storage equipment. 37.29% of respondents strongly agreed, 44.07% agreed and 18.64% remain neutral. He investigator was however shown some of such storage equipment and they include special cold chain ice chest, blood fridge and air conditioners and dark room for the storage of such special items.

D. Challenges Confronting Inventory Management

Inventory management practices as indicated in the problem statement are riddled with a lot of challenges. The researcher probed into the challenges faced by NEGH in this respect. The result is laid bare in the following questions posed in section 4.5 of this chapter. Once again In all the questions posed, respondents were instructed to indicate their preferred option for each statement by ticking (x) in the right column on the 5 likert scale where 1= Strongly Agree, 2=Agree, 3=Neutral, 4= Disagree, and 5=strongly disagree. The table below is the result of respondents' answers in percentages.

Table 4.4.1 Distribution of Responses to determine if the Hospital has Official Inventory Policy

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 38 | 32.20 |
| AGREE | 62 | 52.54 |
| NEUTRAL | 8 | 6.78 |
| DISAGREE | 10 | 8.48 |
| STRONGLY DISAGREE | | |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

i. Distribution of Responses to determine if the Hospital has Official Inventory Policy

Question 14 seeks to find out if the Hospital has official inventory policy to guide the operations of inventory management. Responses indicated 32.20% strongly agreed, 52.54% agree, 6.78% remain neutral and 8.48% disagreed. The head of the stores confirm to the existence of a policy document for inventory management and a copy was shown to the researcher

Table 4.4.2 Distribution of Responses to determine if the Stores are informed on Usage rate, Service level, and Stock out Risk

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 40 | 33.90 |
| AGREE | 52 | 44.07 |
| NEUTRAL | 12 | 10.17 |
| DISAGREE | 14 | 11.86 |
| STRONGLY DISAGREE | | |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

ii. 4.4.2 Distribution of Responses to determine if the Stores are informed on usage rate, Service level, and Stock out Risk

The next questioned to find out if the hospital have information on usage, service level and stock out risk and responses shows 33.90% strongly agreed, 44.07% agree, 10.17% remain neutral and 11.86% disagree. Stock out of inventory materials can lead to inefficient service delivery and even cause death of clients. It is only when the hospital is informed of the stock out risk that it can put in place measures to prevent it.

Table 4.4.3 Distribution of Responses to determine if Orders are based on Quantity Discount and EOQ

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|----------------|-----------|----------------|
| STRONGLY AGREE | 2 | 1.70 |
| AGREE | 12 | 10.17 |
| NEUTRAL | 22 | 18.64 |
| DISAGREE | 34 | 28.81 |

| | | |
|-------------------|------------|------------|
| STRONGLY DISAGREE | 48 | 40.68 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

iii. Distribution of Responses to determine if Orders are based on Quantity Discount and EOQ

The next question asked respondents to respond to whether orders are based on quantity discount and EOQ. Quantity discount will allow the hospital to obtain more of an ordered item at a less cost and the EOQ will also give an optimal cost of ordering and holding inventory in stock. Responses shows 1.70% strongly agrees, 10.17% agree, 18.64% do not know, 28.81% disagree and 40.68% strongly disagree.

Table 4.4.4 Distribution of Responses to determine if Reorder Point is based on Safety, Maximum, and Minimum Stock Level

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 8 | 6.78 |
| AGREE | 44 | 37.30 |
| NEUTRAL | 24 | 20.33 |
| DISAGREE | 32 | 27.12 |
| STRONGLY DISAGREE | 10 | 8.47 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

iv. Distribution of Responses to determine if Reorder Point is based on Safety, Maximum and Minimum Stock Level

Stock levels are vital in inventory management. while the maximum stock level is a point beyond which stock must not be allowed to exceed because it tie up working capital and also encourage pilfering, the minimum stock level is the level is the point below which stock should not fall because it has the potential to bring operations to a halt. Respondents were asked to answer whether reorder point is based on these stock levels. 6.78% strongly agree, 37.30% agreed, 20.33% remain neutral, 27.12% disagree, and 8.47 strongly disagree that orders are based on safety, minimum and maximum stock levels.

Table 4.4.5 Distribution of Responses to determine if Orders Sometimes Arrive Late

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 6 | 23.73 |
| AGREE | 10 | 50.85 |
| NEUTRAL | 14 | 11.86 |
| DISAGREE | 60 | 8.48 |
| STRONGLY DISAGREE | 28 | 5.08 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

v. **Distribution of Responses to determine if Orders sometimes Arrive Late**

Question 18 asked respondents if orders sometimes arrive late. Responses show that late arrival of orders is the orders of the day with 23.73% strongly agree, 50.85% agreed, 11.86% neutral, 8.48% disagree and 5.08% strongly disagree. The Administrator explained that follow up on suppliers to supply orders is mostly not done because of the inability of the hospital to pay its suppliers on time, so at times, they are at the mercy of the suppliers to supply and that explain why orders mostly arrive late.

Fig 4.6 a bar chart showing responses to determine if Orders sometimes Arrive Late

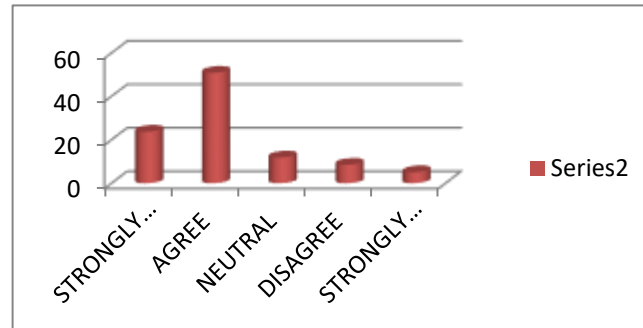


Table 4.4.6 Distribution of Responses to determine if Inventory Policy allow for Periodic or Continuous Inventory review

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 12 | 10.17 |
| AGREE | 66 | 55.93 |
| NEUTRAL | 36 | 30.51 |
| DISAGREE | 4 | 3.39 |
| STRONGLY DISAGREE | | |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

vi. **Distribution of Responses to determine if Inventory Policy allow for Periodic or Continuous Inventory review**

The hospital has an inventory policy that allows for continuous or periodic review of inventory according to the responses received for this question. 10.17% of respondents strongly agreed, 55.93% agree, 30.15 remain neutral, and 3.39% disagree.

Table 4.4.7 Distribution of Responses to determine if the Stores have Receipt and Dispatch Dock

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 2 | 1.70 |
| AGREE | 18 | 15.25 |
| NEUTRAL | 14 | 11.86 |
| DISAGREE | 26 | 22.04 |
| STRONGLY DISAGREE | 58 | 49.15 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

vii. Distribution of Responses to determine if the Stores have Receipt and Dispatch Dock

Question 20 asked respondents to answer if the stores have a receipt and dispatch dock. Responses shows that 1.70 strongly agree, 15.25% agree, 11.86 are neutral, 22.04 disagree and 49.15 strongly disagree. Observations reveal that the stores do not have a dispatch bay. The store room serve as both the receipt and dispatch bay. This can encourage pilfering as requisitioners always have access to the store room.

Table 4.4.8 Distribution of Responses to determine if Unauthorized Personnel are not allowed into the Stores

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 10 | 8.47 |
| AGREE | 12 | 10.17 |
| NEUTRAL | 16 | 13.56 |
| DISAGREE | 38 | 32.20 |
| STRONGLY DISAGREE | 42 | 35.59 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

viii. Distribution of Responses to determine if Unauthorized Personnel are not allowed into the Stores

Question 21 ask seek to elicit responses as to whether unauthorized personnel are not allowed into the stores and answers provided shows that unauthorized personnel are allowed into the stores. 8.47%strongly agree, 10.17% agree, 13.56 remain neutral, 32.20% disagree and 35.59% strongly disagree that unauthorized personnel are not allowed into the stores.

Table 4.4.9 Distribution of Responses to determine if Stores Keys are always in the Custody of Store Staff

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 2 | 1.69 |
| AGREE | 22 | 18.64 |
| NEUTRAL | 14 | 11.86 |
| DISAGREE | 44 | 37.30 |
| STRONGLY DISAGREE | 36 | 30.51 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

ix. Distribution of Responses to determine if Stores Keys are always in the Custody of Store Staff

Question 22 asked respondents if the stores keys are always in the custody of store staff.1.69% strongly agree, 18.64% agree, 11.86% are neutral, 37.30% disagree and 30.51% strongly disagree that store key are always in the custody of store staff. The head of stores explained that the keys are left at the gate to the security personnel upon closure of work. That explains why unauthorized personnel always have access to the stores as upon the instructions of the Administrator; anyone can go for the keys from security and have access to the stores in the absence of store staff.

Table 4.4.10 Distribution of Responses to determine how often Stock taking is done

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|--------------|------------|----------------|
| QUARTERLY | 90 | 76.27 |
| MONTHLY | 10 | 8.47 |
| YEARLY | 2 | 1.70 |
| NO IDEA | 12 | 10.17 |
| WEEKLY | 4 | 3.39 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

x. Distribution of Responses to determine how often Stock-taking is done

Respondents answer to question 23 shows that stock-taking is done at the stores, however respondents seems to disagree on how often stocking is done. While 76.27% says that stocking is done once every quarter, 8.47% settled on monthly, 1.70% chooses yearly, 10.17% have no idea as to when stocktaking is done and 3.39% says that stocktaking is done weekly.

Table 4.4.11 Distribution of Responses to determine Stock-taking method employed

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|---------------------|------------|----------------|
| PERIODIC | 52 | 44.07 |
| PERIODIC/CONTINUOUS | 28 | 23.73 |
| NO IDEA | 18 | 15.25 |
| CONTINUOUS | 20 | 16.95 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

xi. Distribution of Responses to determine Stock-taking method employed

Question 24 asked respondents to state the method employed in during stocktaking. 44.07% of respondents wrote periodic method, 23.73% wrote periodic and continuous, 15.25% have no idea, and 16.95% choose the continuous method of stocktaking as the method during stocktaking.

xii. Coding of Materials in Stock

Question 25 asked respondents if materials in stock are coded. Question 26 asked respondents how the coding is done and question 27 was on the method of coding. Answers suggested that materials in the stores are not coded.

E. Internal Control Systems to Control Inventory

An inventory control system has to do with the mechanism to ensure the availability and judicious use of inventory at stores to meet demand and prevent wastage. Questions asked include departments having requisition books, authorization of requisitions for demand at the stores, honoring emergency request as and when necessary, user units having a place to keep requested items and the speed with which items are delivered by the stores to user units.

In all the questions posed, respondents were instructed to indicate their preferred option for each statement by ticking (x) in the right column on the 5 likert scale where 1= Strongly Agree, 2=Agree, 3=Neutral, 4= Disagree, and 5=strongly disagree. The table below is the result of respondents' answers in percentages.

Table 4.5.1 Distribution of Responses to determine if all User Units have Requisition Book

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 102 | 86.44 |
| AGREE | 16 | 13.56 |
| NEUTRAL | | |
| DISAGREE | | |
| STRONGLY DISAGREE | | |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

i. Distribution of Responses to determine if all User Units have Requisition Book

Question 28 asked respondent to answer if all user units have requisition book. The requisition book is a store document in the custody of user department used to formally request for materials from the stores. Responses indicated that 86.44% strongly agree while 13.56% agree that all units have requisition book that they use to request for supplies from the stores.

Table 4.5.2 Distribution of Responses to determine if Requisition can be made only on Specific days in the Week

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 24 | 20.34 |
| AGREE | 76 | 64.41 |
| NEUTRAL | 8 | 6.78 |
| DISAGREE | 10 | 8.47 |
| STRONGLY DISAGREE | | |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

ii. Distribution of Responses to determine if Requisition can be made only on Specific days in the Week

Question 29 asked respondents to answer if requisition can only be made on specific days within the week and 20.34% of respondents strongly agree, 64.41% agree, 6.78% remain neutral and 8.47% disagreed to that question. The stores personnel revealed that requisition can only be made on Mondays and Tuesdays of every week so that the other days can be used to update ledger books, tally cards and carry out the other activities of the stores.

Table 4.5.3 Distribution of Responses to determine if User Departments seek for Authorization before Submitting Requisition book to the Stores

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 64 | 54.24 |
| AGREE | 52 | 44.07 |
| NEUTRAL | 2 | 1.69 |
| DISAGREE | | |
| STRONGLY DISAGREE | | |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

iii. Distribution of Responses to determine if User Departments seek for Authorization before Submitting Requisition book to the Stores

The next question investigated to find out if user department seek for authorization before submitting requisition book to the stores for supplies. This ensures that authorities are made aware of where supplies are sent to be used in the provision of services and also prevent the situation where supplies from stores are diverted for personal gain. 54.24% strongly agreed, 44.07% agreed and 1.69% remained neutral that user department seek for authorization before requisition is forwarded to the stores.

Table 4.5.4 Distribution of Responses to determine if items are delivered as soon as they are ordered from the Stores

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | | |
| AGREE | 28 | 23.73 |
| NEUTRAL | 6 | 5.09 |
| DISAGREE | 42 | 35.59 |
| STRONGLY DISAGREE | 42 | 35.59 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

iv. Distribution of Responses to determine if items are delivered as soon as they are ordered from the Stores

This question is posed to determine if requested items are delivered as soon as they are ordered from the stores. The purpose of requesting items may no longer be necessary if it takes a long time to supply the said item especially if it is to save the life of a sick patient. responses indicated that 23.73% strongly agree, 5.09% remain neutral, 35.59% disagree, and another 35.59% strongly disagree to this question.

Table 4.5.5 Distribution of Responses to determine if Emergency Request is Honored outside days set aside as Requisition Days

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 4 | 3.40 |
| AGREE | 62 | 52.54 |
| NEUTRAL | 34 | 28.81 |
| DISAGREE | 10 | 8.47 |
| STRONGLY DISAGREE | 8 | 6.78 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

v. Distribution of Responses to determine if Emergency Request is Honored outside days set aside as Requisition Days

Question 32 was to find out if emergency request is honored by the stores outside days set aside as requisition days. 3.40% of respondents strongly, 52.54% agree, 28.81% remain neutral, 8.47% disagree and 6.78% that emergency request is honored outside days set aside as requisition days.

Table 4.5.6 Distribution of Responses to determine if User Departments are consulted before Procurement of items

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 4 | 3.39 |
| AGREE | 24 | 20.34 |
| NEUTRAL | 26 | 22.03 |
| DISAGREE | 24 | 20.34 |
| STRONGLY DISAGREE | 40 | 33.90 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

vi. Distribution of Responses to determine if User Departments are consulted before Procurement of items

Question 33 investigated to find out if user departments are consulted before procurement of items. When user department are invited to make input into items before procurement, issues like these items are not compatible with my machine and i find it difficult using these supplies are always eliminated. Respondents' answers shows 3.39% strongly agree, 20.34% agree, 22.03% remain neutral, 20.34% disagree and 33.90% strongly disagree.it is evident from the above responses that user department are always not consulted before procurement of items.

Table 4.5.7 Distribution of Responses to determine if User Departments have a place to keep items requested from Store

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | 32 | 27.12 |
| AGREE | 78 | 66.10 |
| NEUTRAL | 6 | 5.09 |
| DISAGREE | 2 | 1.69 |
| STRONGLY DISAGREE | | |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

vii. **Distribution of Responses to determine if User Departments have a place to keep Items requested from Store**

Questions 34 ask respondents to answer whether user units have a secured place to keep requested items from the stores. Responses shows that 27.12% strongly agree, 66.10% agree, 5.09% remain neutral and 1.69% disagreed that user units have a place to store items requested from stores.

Table 4.5.8 Distribution of Responses to determine if there is Satisfaction with the Services provided by the Stores

| RESPONSES | FREQUENCY | PERCENTAGE (%) |
|-------------------|------------|----------------|
| STRONGLY AGREE | | |
| AGREE | 60 | 50.85 |
| NEUTRAL | 56 | 47.46 |
| DISAGREE | | |
| STRONGLY DISAGREE | 2 | 1.69 |
| TOTAL | 118 | 100 |

Source: Field survey, July, 2016

viii. **Distribution of Responses to determine if there is Satisfaction with the Services provided by the Stores**

Question 35 seeks to examine if there satisfaction of the services provided by the stores to user units and responses indicated that 50.85% of respondent agree, 47.46% remain neutral and 1.69 strongly disagree. Clearly there is some level of dissatisfaction with the level of service provided by the stores to user units.

F. Measures to Improve Inventory Management

In analyzing measures to improve inventory management, as part of inventory management practices in the hospital, priority was given to delays in stock replenishment, regular calculation of safety stock to ensure that it is updated, quarterly procurement meeting, delays in approval of items to be procured, and the automation of stores activities. In all the questions posed, respondents were instructed to indicate their preferred option for each statement by ticking (x) in the right column on the 5 likert scale where 1= Strongly Agree, 2=Agree, 3=Neutral, 4= Disagree, and 5=strongly disagree. The table below is the result of respondents' answers in percentages.

Table 4.6.1 Measures to Improve Inventory Management

| MEASURES TO IMPROVE INVENTORY MANAGEMENT | 1 | 2 | 3 | 4 | 5 |
|--|-------|-------|-------|-------|-------|
| | % | % | % | % | % |
| There is no delay in replenishment of stock | 5.08 | 5.08 | 22.04 | 27.12 | 40.68 |
| Safety stock is calculated on a regular basis to ensure that they are up to date | 1.70 | 66.10 | 28.81 | 3.39 | |
| Operating inventory categories include safety stock, replenishment stock, obsolete stock | 62.71 | 35.59 | | | 1.70 |
| The hospital holds quarterly procurement meeting | 6.78 | 59.32 | 23.73 | 6.78 | 3.39 |
| There is no delay in approval of items to be procured by entity head | 1.70 | 11.86 | 8.47 | 30.51 | 47.46 |
| Frequency of order is determined based on calculations that minimizes overall cost | | 64.41 | 32.20 | 3.39 | |
| The stores activities have been automated | | 1.70 | 18.64 | 15.25 | 64.41 |

Source: Field survey, July, 2016

As indicated in Table 4.8.1 above, on the issue of no delay in replenishment of stock, 5.08% strongly agreed, and another 508% agreed that there is no delay in replenishment of stock, 22.04% remain neutral, 27.12% disagree, and 40.58% strongly disagreed. These indicate that there is always some delays in the replenishment of stock. On the

issue of whether safety stock is calculated on a regular basis to ensure that they are up to date, 1.70% strongly agreed, 66.10% agreed, 28.81 are neutral, and 3.39% disagreed. This indicated that safety is stock is calculated but is not done on a regular basis. When respondents were asked if operating inventory categories include safety stock, replenishment sock and obsolete stock, answers indicated 62.71% strongly agreed and 35.59% agreed. This means that the hospitals operating inventory include safety stock, replenishment stock and obsolete stock. 6.78% strongly agreed, 9.35% agreed, 23.73% remained neutral, 6.78% disagreed, and 3.39% strongly disagreed that the hospital hold quarterly procurement meeting. The researcher was shown minutes as evidence of this meeting. On the issue of whether there is no delay in approval of items to be procured by the entity, 1.70% strongly agreed, 11.86% agreed, 8.47% remained neutral, 30.51% disagreed, and 47.46% strongly disagreed. The body language of the store staff reveal that there is delay in approval of items to be procured by the entity as a result of beaucratic procedures and also because the head of the institution is a surgeon, he is mostly not in the office to approve for the procurement of items. Respondent were asked to answer if frequency of order is determined based on calculations that minimizes overall cost and responses shows that 64.41%, 32.20% and 3.39% agreed, remained neutral, and disagreed respectively. This means that frequency of order is basically not determined by calculations that minimize overall cost. Finally respondents were asked if the stores activities have been automated and responses indicated that .70% agreed, 18.64% remain neutral, 15.25% disagreed, and 64.41% strongly disagreed. Observation at the stores shows that things are done manually and that the stores activities have not been automated.

V. SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

This final section of the study contained the summary of findings based on research questions and objectives. This was followed by the conclusions and then recommendations. The reason for the selection of this research topic was not only the public demand for prompt effective and efficient service delivery in Ghana Health Service Institutions, but to ascertain whether health institutions have embraced good inventory management to aid the delivery of health care to sick patients. Again, the choice of New Edubiase Government Hospital for the Study was based on the fact that the researcher will be able to have easy access to required information and data.

A. Summary of Findings

The finding gathered from the study is summarized under 6 main themes. These are findings from demographics of respondents, inventory management procedures, efficiency of inventory management, challenges of inventory management, internal control measures of inventory and measures to control inventory.

B. Background of Respondents

In investigating the background of the respondents, it was established that the female workers dominated the male workers population of the workforce. Majority of the staffs were senior level management personnel, but on the whole, the ratio of the senior staff to middle level staff and junior staff is balanced. The age of respondents reveal that workers experience is balanced with workers just over a year ago to those who have been in the system for over 21 years. There is a blend of fresh graduates and experienced workers at the facility.

C. Inventory Management Practice

The study revealed that the New Edubiase Government Hospital practices of inventory management involve a quarterly procurement of major inventory. The inventory is mostly supplied by suppliers and the goods are accompanied by waybill and invoices. The hospital also has an inspection team made up of an account staff, internal Audit and user Department who inspect the goods before they are moved into the stores. Approval is sought from management each time request for replenishment from suppliers. However materials ordered are mostly not received on time, ledgers are not updated promptly upon receipt of goods from suppliers and emergency orders are not given the due attention it deserved.

D. Inventory Management Efficiency

The study revealed that inventory management practices of the hospital are efficient. The hospital has a store room at the premises and it is large enough to accommodate all items needed for by the hospital, and the store room serve multipurpose task such as receipt and dispatch. The store rooms also have pallets, shelves, drawers, and trolleys. There is a good lightening system, and special storage equipment meant to store special commodities at the stores.

E. Challenges Confronting Inventory Management

The hospital has an official inventory management policy guide to regulate the stores operations, thus the stores is informed on usage rare, service level, and stock out situations, the policy allows for a periodic or continuous review of inventory. Orders however are not based on quantity discount and EOQ Formula. Orders are rather based on safety, minimum and maximum stock levels. Orders mostly arrive late and the hospital store has no receipt and dispatch dock. It is worrying to find out that unauthorized personnel have access to the store even in the absence of the store staff, and the store keys are always not in the custody of store staff. The stores undertake stocktaking however workers are not so sure of the method of stocktaking employed during such practice, and the duration within which it is done. Materials in the stores are not coded.

F. Internal Control Measures

From the study, it was realized that all user department have requisition books, and requisition can be made only on specific day within the week which is between Monday and Wednesday. User department always seek for authorization before submitting requisition to the stores. There are delays in fulfilling users request from the stores. User department are also not consulted before replenishment of the stores. User departments have a place within their wards to store requested items from the stores. The level of satisfaction of the service provided by the stores is good.

G. Measures to Improve Inventory Management

The study revealed that replenishment of stock is always delayed. Safety stock is always calculated on regular basis and the operation inventory categories include safety stock, replenishment stock, and obsolete stock. The hospital holds quarterly procurement meeting, however there is delays in the approval of items by the Entity Head, and the activities of the stores is done manually with no automation of such activities.

H. Findings

From the analysis and discussions, the following findings were discovered:

- It was observed that materials ordered are not received on time
- Ledgers and other records are not updated on time
- Emergency orders are not given the due attention it deserves
- Dispatch dock, and receipt dock is located within the storeroom
- Orders are not based on quantity discount and EOQ
- Unauthorized personnel are allowed into the stores
- Store keys are left at the security gate upon closure of work
- Method of stocktaking is not known
- Duration if stocktaking is not known
- Items stored in store is not coded
- Items are not delivered as soon as ordered from the stores
- User department are not consulted before procurement of items
- There are delays in stock replenishment
- There are delays in approval of items to be supplied to the hospital.
- The store activities have not been automated.

I. Conclusion

After a thorough research to examine inventory management practices to improve service delivery, it has come to light that most health service institutions including the NEGH depend on outside suppliers for their supplies, however such supplies always arrive late due to lack of commitment on the part of the supplier chosen, store ledgers are not updated promptly which can lead to discrepancies between physical balance and book balance. Emergency orders are treated as normal orders, unauthorized entry into the stores leading to pilfering and theft, and delays in serving requisitions presented to the stores. These have the potential to derail the goal of effective service delivery. Effective inventory management practices impacts greatly on health care delivery in health institutions. A decline in inventory management leads to a decline in increased patients dissatisfaction, and prolonged ailments, and even death. The good news is that, there is a better approach to inventory management as researched in the study. NEGH system of inventory management is working; nevertheless, there is more room for improvement. Managers of Public Health Institutions

must ensure that best practice of inventory management in this research and others are implemented to help ease the challenges of inventory management practices in Public Health Institutions.

J. Recommendations

Looking at the problems faced in the stores department, the following recommendations were made for implementation to enhance inventory management practices in NEGH

1. There should be coordination between store and suppliers to ensure that materials ordered are received on time
2. Ledgers and other records must be updated on time to ensure that ledger and physical balance tally to help detect theft early.
3. Emergency orders are to be given the due attention it deserves to prevent needless suffering and death of clients.
4. Dispatch dock, and receipt dock should be decouple from within the storeroom to reduce incidence of pilfering.
5. Orders are to be based on quantity discount and EOQ to ensure the best value for money spent is achieved.
6. Unauthorized entry into the stores must be brought to an end. This is to prevent pilfering, theft, and accidents within the stores.
7. Store keys must always be in the possession of store staff for security reasons and also prevent unauthorized entry into the store
8. The method of stocktaking be it periodic or continuous stocktaking must be known.
9. Duration if stocktaking must also be known.
10. Items stored in store must be coded for easy identification to reduce delays in serving requisition from user department.
11. Items must be delivered as soon as ordered from the stores for smooth operations.
12. User department are to be consulted before procurement of items to ensure that what is needed is what is bought to prevent wastage in the system.
13. Authority for approval of items to be supplied to the hospital must not be delayed to prevent item stock-out at the stores.
14. Electronic gadgets such as computers should be employed to help keep records and reduce stress on store staff.

K. Direction for Future Research

This research work with the topic” the impact of Inventory Management Practices in Health Service Delivery” was done in NEGH. Another researcher can undertake a research with the same topic in another government hospital, missionary hospital or a private hospital to help inventory management have greater impact in health delivery in the country.

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