ASSESSMENT OF INVENTORY MANAGEMENT PROBLEM

DEGREE OF MASTERS OF BUSINESS ADMINSTRATION

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ASSESSMENT OF INVENTORY MANAGEMENT PROBLEM IN GURAGE ZONE HEALTH CENTERS

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ADVISORS' THESIS SUBMISSION APPROVAL SHEET

This is to certify that the thesis entitled "**Assessment of factors affecting inventory management practices in Gurage zone health Centers"** submitted in partial fulfilment of the requirements for the degree of **Master's** with specialization in **Business Administration,** the Graduate Program of the **Department of management,** and has been carried out by **Hashim Asmera Yassin,** under my supervision. Therefore I recommend that the student has fulfilled the requirements and hence hereby can submit the thesis to the department.

Sintayehu Fisaha (Asst. Prof.)		28/10/2013
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Name of Co-advisor	Signature	Date

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We, the undersigned, members of the Board of Examiners of the final open defense by **Hashim Asmera Yassin** have read and evaluated his/her thesis entitled "**Assessments of inventory management problem in Gurage zone health centers**", and examined the candidate. This is, therefore, to certify that the thesis has been accepted in partial fulfillment of the requirements for the **degree of masters of business administration (MBA General).**

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DECLARATION

I hereby declare that this submission is my own work towards the Master of Business Administration in Factors Affecting Inventory Management Practice of Gurage Zone Health Centres and that, to the best of my knowledge, it contains no material previously published by another person, nor material which has been accepted for the award of any other degree of the University, except where due acknowledgements have been made in the text.

Hashim Asmera, Yassin (GSE2010/19) ……. ……..

Student Full Name & ID Signature Date

List of Acronyms and Abbreviations

AST	Adaptive Structuration Theory
ABC/VEN	Vital/Essential/Non-essential Drugs
CMS	Central Medical Store
EOQ	Economic Order Quantity
FEFO	First Expired First Out
FMOH	Federal Ministry of Health
GIA	Genera Internal Audit
IPLS	Integrated Pharmaceuticals Logistics System
IM	Inventory Management
JIT	Just In Time
LMIS	Logistics Management Information System
MRP	Material Requirement Planning
PFSA	Pharmaceuticals Fund and Supply Agency
PSTP	Pharmaceuticals Supply Transformation Plan
RDF	Revolving Drug Fund
SCM	Supply Chain Management
SOP	Standard Operating Procedure
TCE	Transaction Cost Economics
VMI	Vendor Managed Inventory
ANOVA	Analysis of Variance
PFSA	Pharmaceutical Fund and Supply Agency

Table of Contents

LIST OF TABLES

List of figures/illustrations

ABSTRACT

The purpose of this study was to assess factors that affect the inventory management practice of Gurage zone health centers. The researcher adopted descriptive and inferential study design. A stratified random sampling technique was applied to the study. Both primary and secondary sources of data were used for the study. The researcher used a sample size of 35.8 %(222 respondents) of the target population. The researcher used questionnaire to collect data for the research. The questionnaire contained open ended questions for the purposes of group discussion for Woreda and Zonal management and closed ended questions which have five point Likert scale questions for the selected health centers informants and covered areas of factors of inventory management practice to come up with good raw data for the research. The collected data were quantitatively analyzed using statistical methods by using SPSS version 20 which was commanded to produce frequency tables, graphs, regression coefficient result, analysis of variance and model summary for effective interpretation The various factor influencing inventory management practice were broken into four major areas which of these are demand uncertainty, infrastructure , management support and procurement related procedures .The particular objective that were analyzed include; evaluation of the effects of demand uncertainty, infrastructure, management support and procurement related procedures on inventory management practice. The key findings from the study revealed that demand uncertainty, management support, infrastructure and procurement related procedures are the challenges/factors to have a proper inventory management practices on the Gurage zone health centers. The researcher recommend that the health centers management and employees, woreda health offices , zonal health department and other concerned bodies should work cooperatively to improve the overall inventory management practice by improving the challenges mentioned above. Finally, the researcher suggested that further research should be done to further explore the relationship between inventory management practice and service delivery status and how to solve the challenges of inventory management practices of the health centers.

Key words: Assessment, effects, evaluation, inventory management practices, factors, and explained.

CHAPTER ONE

INTRODUCTION

1.1Background of the study

Since the beginning of human race, people have managed inventory. First, cave dwellers stored wood as fuel for fire, light and heat. When a person visit supermarket, they buy all the goods they will need for a whole week. These goods are placed in storage and used according to their daily needs. Every day, companies across the world manage inventory items related to their trade. Banks manage the inventory of capital as the principal raw materials offered to their customers and hospital needs an inventory of medicines and biomedical tools in order to offer good services for their patients and soon.

The World Bank report shows that approximately 5% of global GDP disappear through mismanagement of resources as there is no proper control over the inventory as the result economy of most countries especially to less developed countries like Tanzania fails to grow at the reasonable and preferable percentage (Kant, 2007).

Whether it is a private or public organization, the acquisition, storage, issuance, and usage of stock is very important in running operations of the business. Organizations allocate resources for their activities. To achieve business's objectives, organizations have to acquire, allocate and control both material and financial resources. Inventory management as one of the key activities of business functions has always been a major preoccupation for the company's growth and survival. (Woldeabreha Berhane, 2015)

Inventory is the commodities, supplies, equipment, and other materials those are available in stock in an institution (Ministry Of Medical Services, 2016). Commodity management is the process of getting logistics, controlling, transporting, and storing up and distributing commodities through keeping the commodities financial records. Management of basic health commodities concepts is growing as it is very important in various countries (USAID/Deliver Project, 2016).

Inventory is the availability of any stock or resources at right size and quality used in an organization. An inventory management system is the set of policies that controls and monitors inventory level and determine what level should be maintained, how large orders should be made and when stock should be restocked so as to support the operation of the business (Miller, 2010).

Efficient laboratory and medical commodities management ensures that hospital have an up to date inventory count at all times, giving good customer service, giving accurate information to customer and improve image of the medical treatment centre (WHO,2016).Robust inventory management system allows managers to receive real time information on inventory. This will assist management to accurately made informed decisions, anywhere, anytime and save time and cost used for labor and thus working on inventory management properly(USAID| Delivery Project,2016).

The availability of drugs and medical supplies is critical to the success of any healthcare program. Drugs and medical supplies are part of the final link between patients and health services. They play a key role in prevention, treatment and care programs, and in order to sustain these services, numerous medical commodities are required. A reliable and stable supply of these commodities to health facilities at all levels of the health system will determine the success of these nationwide programs .Managing stock effectively is important for any organization, running a health institution is no exception because without enough stock, health services to patients will come to a halt. Stock represents the largest single investment in assets for most organizations. In most organizations, employees have become habituated with high levels of commodity availability resulting in higher stock holding levels (Chopra and Meindl, 2007). The terms “stock” and “inventory” can be used interchangeably. The extent of the stock is influenced by operational needs of the organization, time required to obtain deliveries of stock, availability of capital, cost of storage and the need for detailed records in the form of stock issues which should be kept through the use of store records. Having considered funds available, storage facility available, rate of consumption of materials, lead time, margin of safety, and the stock level can then be set for each material. Stock levels should also be indicated on the stock records. Items should not be issued unless covered by Materials Requisition form (Esther, 2015).

Inventory management is a very important function that determines the health of the supply chain as well as the impacts the financial health of the balance sheet. Every organization constantly strives to maintain optimum inventory to be able to meet its requirements and avoid

over or under inventory that can impact the financial figures (http:// www. managementstudyguide,2017).

The findings observed from different research shows that inventory management has now become the major concern of the public sector since inventory is said to be the solid cash of resources been expanded annually without proper accountability and health facilities must provide 24 hour services and accordingly, the need to keep stocks of certain medicines and other medical supplies to be able to discharge their duties effectively. Because of this the researcher study the title factors affecting inventory management practice in Gurage zone health centers. When I came to the background of Gurage zone health department at the moment administer 21 Woreda and town administration which have 72 health centers and 6 hospitals. Which of 10 were new and these 10 health centers were rejected from the sample data.

1.2 Statement of the Problem

Inventory management is the process of efficiently overseeing the constant flow of units into and out of an existing inventory. This process usually involves controlling the transfer in of units in order to prevent the inventory from becoming too high, or dwindling to levels that could put the operation of the company into jeopardy. Agus and Noor (2010) states that proper inventory management also seeks to control the costs associated with the inventory, both from the perspective of the total value of goods included and the tax burden generated by the cumulative value of the inventory.

To continue serving the demand of customers most firms have realized the need to maintain proper inventory management. Proper management of inventory enables firms to mitigate inventory costs, reduce lead time and on-time delivery of goods and services. According to Wisner et al (2011) organizations that maintain proper inventory of raw materials are more likely to complete their production on time. Shapiro et al 2009 Inventory management control is part of the inventory management: that helps to maintain continuity of production operations by maintaining a smooth flow of raw materials without shortages (Njoroge, 2015).

Effective inventory management can play a vital role in cutting inventory holding costs across the different stages of the supply chain; this is especially in developing countries like Ethiopia where budget for health commodities are often tight. In a health facility overstocking of certain items may tie up a substantial portion of the health commodity budget, leaving insufficient funds

for other important perhaps lifesaving medicines. For this reason it is very important to control the building up of inventory. In addition to cost holding, excess inventory can lead to obsolescence and reduce an enterprise's flexibility. In case of a health facility excess inventory may lead to expiry of some health commodities (Kagashe&Massaw ,2012).

According to the research conducted on Ethiopian Pharmaceuticals Supply Agency, Addis Ababa, Ethiopia shows that the total 70 program commodities managed by the agency, 2.1% wasted due to expiration and damage. These resulted in a loss of over US $2 million. The highest wastage was recorded for anti malarias which accounted for 13.1% of the malaria commodities' total inventory value. Only 14.8% of the orders were fulfilled above 80%. Thirty-seven items were stock out on average for 8.5 average days. Longer duration of stock out (260 days) was recorded for TB commodities. Seventeen items from different programs were purchased through emergency orders with a higher frequency of level no registered purchase. Only 6 (60%) warehouses met acceptable storage conditions. Space deficit, outdated warehouse designs, shortage of warehouse equipment, lack of precise data, and capacity building gaps were the inventory management challenges identified.

The study conducted before shows that there is service deliver problem in the health centers most of them comes from due to inventory management practice of the health centers.. Selection of medicines without the use of national essential medicine list (NEML) by pharmacy section only, quantities of health commodities determined by guess, no a supply planning used to decide on the time table of procurement, no responsible person for procurement ,what to procure, from where and how much to procure; unreliable transportation system, in adequacy of storage spaces and lack of electronic stock management tool were found in majority of the HCs. Health facilities must provide 24 hour services and accordingly, the need to keep stocks of certain medicines and other medical supplies to be able to discharge their duties effectively.

Public sector in across developing countries mostly leave inventory decision to departments as well as stores management, as a result there are relating problems in terms of high cost of inventory, selection of suppliers, delivery problems, stock obsolescence, stock-out, etc. Intermittent and emergency purchases are common procurement practices in most of the public institutions as against the public procurement laws as proper procurement procedures are not duly followed.

Although there have been several research in the area of inventory and supply chain management in ensuring organizational performance, little studies have been done to view the role of inventory control in healthcare delivery especially in developed country. However, considering the issue of costs, supplier selection, variability and uncertainty in demand and supply, there is the need for a critical study in this area as they are most often positively correlated to major supply chain issues within organization such as inventory stock levels, delivery frequency, etc.

The research conducted by different scholars and the practical observation on health care institution shows that there is a serious gap on service deliver especially like the limited access of prescribed pharmaceuticals input, and reagent for testing tools and soon most of them directly related to the inventory management practice. Therefore, the major reason that the researcher impressed to conduct on this title was to address systematically the inventory management problem of Gurage zone health centers and to give a suggestion for the concerned bodies to contextualize the findings in to locality. The gap on research conducted before focused on a single hospital or business/service delivery organization and most research also addressed the practice of inventory management .The research conducted before also addressed problems of inventory management practice as one specific objectives. Because of the gap mentioned above the study addressed the issue of factors affecting the inventory management practice solely.

1.3Objectives of the study

1.3.1 General objective of the study

The general objective of this study is to assess problems of inventory management practice in the case of Gurage zone health centers.

1.3.2 Specific objectives

Specific objectives of the studies are:

- To assess demand **uncertainty** is one of the inventory management practice problem.
- To assess **infrastructure** is one of the inventory management practice problem.
- To assess management **support** is one of the inventory management practice problem.
- To assess procurement related procedures is one of the inventory management practice problem.

1.4 Research Questions

This Study focused on seeking answer to the following research questions to address the stated problem:-

- Is it demand uncertainty one of the inventory management practice problem?
- Is it infrastructure one of the inventory management practice problem?
- Is it management support one of the inventory management practice problem?
- Is it procurement related procedures one of the inventory management practice problem?

1.5 Significance of the Study

The study aimed to assess various problems that might have been in existence in the Gurage zone health centers that may be influencing effectiveness of inventory management in the organization. The finding were assists the health centers in ensuring effective inventory management at all times as it will aid those entrusted with decision making to formulate strategies of combating the persistent problem of inventory management in the health centers. Effective inventory management will result to prudent utilization of resources resulting in improved services to the citizens. This will result to improved economy and social status of the zonal as well country wide in general and also improve the standard of living of the citizens. This study examined the problems of inventory management practice at Gurage zone health centers and suggested strategies to improve the inventory management practice as well. The study offered more meaningful and acceptable outcomes to help the department in considering real problems affecting the success of inventory management and encourage the department in implementing strategies to enhance inventory management. The study also contributed on the limited knowledge in the area of inventory management of health commodity in Ethiopia. The research findings provided insight for researchers who have interest on doing research on the assessments of inventory management problems on the health centers.

1.6 The scope of the study

The health centres and hospitals in Gurage zones are geographically distributed here and there. The farthest and closest Woreda from Gurage zone centre Wolkite account a distance of 120km and 10 km respectively.

Geographical scope

The study does not address the health centres and hospital as a whole in Gurage zone. From the zonal health centres and hospital the study intended to address Wolkite, Emdibir and Gunchire city and also Kebena , Abeshige, EnorEner, Enemorenaener and Cheha woreda administration .Because these woreda and town administration are enough to fulfil the sample needed for the research and have a severe problem on inventory management practice .

Methodological scope

Due to lack of inventory management practice health post and hospital with life span below two years is not a part of this research. Finally, the title factors affecting inventory management practices of Gurage zone health centres by itself is broad the satisfaction levels of the customer /service taker one is left for further investigation/ research.

Conceptual scope

Due to the broadness of assessing problems of inventory management practice, the study left assessing the level of each problems share on the effectiveness of inventory management practices and the relationship between the service delivery statuses of service taker with that of the mentioned problem.

1.7) Limitations of the study

In conducting this study the researcher faced the following challenges;-

It happened that some questionnaires filled by respondents other than expected ones which resulted to reduced reliability and validity of information collected, some respondents demanded allowances or remunerations at abnormal rates which could not be afforded by the researcher. A number of respondents respond the questionnaire by the sense of as part of their evaluation.

Since the study based on only one geographical area (Gurage Zone) might happen that the findings not are a good representative to other parts of the organizations in the country although the study tried to make sure that the scope and objectivity of the study is maintained.

1.8. Organization of the Study

The paper contains five chapters. In the first chapter address the introduction, it is comprised of the background of the study, statement of the problem, objective of the study, research questions, and significance of the study, scope of the study and limitations of the study. The second chapter deals with literature review of the study and the third chapter deals with research methodology that contains description of the study area, research design, research approach, population and sampling, data collection procedures, sources of data and data collection tools, data processing and analysis, validity and reliability of instruments and ethical considerations. The fourth chapter deals about the result and discussion which contains introduction, demographic characteristics of the respondents and the result and discussion on the problems of inventory management and the final chapter deals about summary, recommendations and conclusion that contains the summary and conclusions the study findings and gives recommendations and suggestions.

CHAPTER TWO

RELATED LITRATURE REVIEW

2.1Inventory management concepts

Inventory: These are the stores of materials they keep until needed (Waters, 2003). Inventory or stock (in common terms) is considered to be the central theme in managing materials. The inventory turnover ratio (ITR) is a barometer of performance of materials management function. In the generally understood term, inventory means a physical stock of goods kept in store to meet the anticipated demand. However, from materials management perspective, an apt definition of inventory is "a usable but idle resource having some economic value" (Springer India, 2014). 'Inventory' and 'stock' are often used to relate to the same thing yet when inventory management is mentioned, there is however a slight difference with stock. Stock is usually an amount of goods that is being kept at a specific place (in a warehouse for example), sometimes referred to as inventory. Conversely, inventory management is primarily about specifying the size and placement of stocked goods. Inventory management is necessary at different locations within an organization or within multiple locations of a supply chain, to protect (the production) from running out of materials or goods (Guido, 2009).

Inventory management is very crucial to any organization that is improving on its performance and attaining high levels of customer satisfaction. In another definition the material held by an organization makes up for most of the organization assets. Most organization expends so much money in materials and it is important for the organization to put in place a good store management system in order to manage the store properly. Inventory management is a very important function that determines the health of the supply chain as well as the impacts the financial health of the balance sheet. Every organization constantly strives to maintain optimum inventory to be able to meet its requirements and avoid over or under inventory that can impact the financial resources.

Application of information technology improves the performance of inventory management thereby improving the firms' competitiveness. The use of IT in supply chain and logistics management has attracted increasing attention of the business and academic world. The

possibilities of reducing the bullwhip effect in supply chains through internet based collaboration. Technology application in supply chain context may provide advantages in the following areas: improve supply chain agility, reduce cycle time, achieve higher efficiency, and deliver products to customers in a timely manner. Furthermore, IT may further reduce existing wastes and inefficiencies along the supply chain through increasing real-time movement of shipment and operational control of logistics activities.

2.2 Purpose of inventory

The main purpose of stock is to give a buffer between supply and demand. This safety cushion is essential to ensure the smooth running of operations. Stocks can be row materials, work in process, finished goods, spare parts or consumables (Waters, 2003).

Some of the purposes of inventories were discussed below:

1. To maintain independence of operations. A supply of materials at a work center allows that center flexibility in operation. A supply of materials at a work center allows that center flexibility in operation.

2. To meet variation in product demand. If the demand for the product is known precisely, it may be possible to produce the product to exactly meet the demand

3. To allow flexibility in production scheduling. A stock of inventory relieves the pressure on the production system to get the goods out. This causes longer lead times which permit production planning for smooth the flow and lower-cost operation on through larger lot- size production-high set up costs

4. To provide a safe guard for variation in raw material delivery time. When material in order to a vendor delay can occur for a variety of reason. A normal variation in shipping time, a shortage of material at the vendors plant causing backlogs, unexpected strike at one of the shipping companies, a lost order, or a shipment of incorrect or defective material.

5. To take advantage of economic purchase order size. There are costs to place an order: labor, phone calls, typing, postage, & soon. Therefore, the larger each order is the fewer the orders that need be written (Meng, 2006).

2.3 Classification of inventory

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

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

ii. In-Transit Inventory (Pipeline) is the inventory that is in route from one location to another. It may be considered part of cycle stock even though it is not available for sale and or shipment until after it arrive at the destination.

iii. Safety or Buffer Stock is the stock held in excess of cycle stock because of uncertainty in demand or lead time. The notion is that a portion of average inventory should be devoted to cover short-range variations in demand and lead time.

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

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

vi. Dead (obsolete) Stock is the set of items for which no demand has been registered for some specified period of time. They are out of date, deteriorated or no longer useful as a result of advancements in technology (Esther, 2015).

2.4 Benefits of inventory

Stock and Lambert (2001) state that inventory is a major use of capital and, for this reason; the objectives of inventory management are to increase profitability, to predict the impact of corporate policies on inventory levels, and to minimize the total cost of logistic activities inventory serves basic benefits in the firm . Thus, are

1. Protection from uncertainty

Inventory is held as protection from uncertainties. Raw materials inventories in excess of those required to support production can result from speculative purchases made because management expects either a future price increase or a strike, for example Stock and Lambertet.al (2001).

Raw materials will allow the firm to achieve the following benefits: to take advantage of quantity discount of market prices, to guard against inflation, to provide strategic stocks of items which

could be in short supply due, for instance, to strikes or other supply problems and as a form of investment when price increases are anticipated to cater for the variability of supply

2 .Balancing supply and demand

Seasonal supply and/ or demand may make it necessary to hold inventory. For example, a producer of a premium line of boxed chocolate experiences significant sales volume increase at Christmas, Valentine's Day, and Easter and Mothers day. In contrast, demand for a product may be relatively stable throughout the year but raw materials may be available only at certain times during the year. Such is the case for producers of canned fruits and vegetables Stevenson et.al (2009). This makes it help full to manufacture finished products in excess of current demand and hold them in inventory, unless the raw materials can be purchased from part of the world within with different growing seasons.

3. Acts as a buffer

Buffer stock is a stock allowance to cover the problem related in forecasting the lead time or the demand during the lead time. It is held in individual workstations against the possibility that the upstream workstation may be a little delayed in long setup or change over time. This stock is then delivered while that changeover is happening. These classifications apply along the whole supply chain, not just within a facility or plant. Where these stocks contain the same items, it is often the work practice to hold all these stocks mixed together before or after the sub-process to which they relate .This minimize costs. Because they are mixed up together there is no visual reminder to operators of the adjacent sub-processes or line management of the stock, which is due to a particular cause and should be a particular individual's responsibility with inevitable consequences. Some plants have centralized stock holding across sub-processes, which makes the situation even more serious.

4. Economic order scale

Inventory is required if a firm is to concretized economies of scale in purchasing, transportation and manufacturing. For example, raw materials inventory is important if the manufacturer is to take advantage of the per unit price reductions associated with purchases. However, increasingly when purchase volumes are sufficiently large, purchase contracts are been negotiated based on annual volumes not the amount purchased on an individual order. Purchase materials have a lower transportation cost per unit if ordered in larger volumes. The reason for this lower per unit

cost is that full truckload and railcar shipments receive lower transportation rates than smaller shipment of less than truckload or less than carload size.

2.5 Tips to effective inventory management for health care facility

Cutting costs in hospital inventory management is always a point of emphasis for financial decision-makers at health care institutions. Below are three tips administrators can use to maintain a lean supply chain and make inventory management strength of the institution.
(JumpTech Blog, 2013).

Collaborate with physicians: New medical devices come out every year, doctors and nurses prefer certain instruments that allow them to be as productive as possible. Supply chain managers should push to create a team of physicians who can speak for everyone else at the facility and provide insight into what they need to properly care for patients and other items that are sitting in storage for months on end, according to an article for Healthcare Global (Jump Tech Blog, 2013).

Invest in the right tools: Supply chain managers who are able to effectively keep track of their files, stay updated on contract pricing and validate prices against purchase orders usually have access to the right technologies. Cloud-based inventory management solutions allow hospitals to quickly see a return on investment because they don't need to purchase expensive hardware and the technology doesn't require a lot of training to use (JumpTech Blog, 2013).

Reduce insignificant costs: Items that aren't vital can usually be eliminated to create a more streamlined supply chain. The Healthcare Global article stated that another way to cut costs is to replace devices and equipment from expensive name brands with items from more generic companies that have lower prices. These cost reductions could give supply (JumpTech Blog, 2013).

2.6 Inventory Costs

Inventory represents an investment in the organization whether as a result of deliberate policy or not. Inventory costs are important for three major reasons. First, inventory cost represents a significant component of total logistics cost in many organizations. Second, the inventory levels that a firm maintains at points in its logistic system will affect the level of service the firm can provide to its customers. Third, cost trade off decisions in logistics frequently depends upon and finally affects inventory carrying cost.

As with any other investment, the cost of holding stock must be related to the profit to be gained. To do this effectively, the costs must be identified. The categories of cost associated with inventory are: costs of holding stock (carrying costs), costs of obtaining stock (ordering cost), stock out costs, and the cost of the stock itself.

2.6.1 Costs of holding stock

Costs of holding stock, also known as carrying cost, is the variable cost of keeping inventory on hand, and is a combination of the costs associated with opportunity costs, interest on capital invested on the stock, storage charges (rent, lighting etc.), taxes, equipment maintenance and running cost, insurance and security, shrinkage, and other variables. It reflects one of the highest costs of logistics. If a firm can determine the cost of holding one unit of inventory for one year, it can determine its annual holding cost by multiplying the cost of holding one unit by the average inventory held for a one-year period. Average inventory can be computed by dividing the amount of goods that are ordered every time an order is placed by two. Thus, average inventory is expressed as Q/2; annual holding cost can be expressed as H (Q/2). Where H= Holding cost, Q= Quantity.

2.6.2 Costs of Obtaining Stock

The costs, sometimes known as ordering or procurement cost is the expense of placing an order for additional inventory and does not include the cost or expense of the product itself. It includes the clerical and administrative costs associated with the purchasing, accounting and goods received departments; transport cost; and set up and tooling costs associated with each production run where goods are manufactured internally. Set up cost refers more specifically to the expense of changing or modifying a production or assembly process to facilitate product line change over's. The fixed portion of set up cost must include use of the capital equipment needed to change over production facilities, while the variable expense might include the personnel costs incurred in the process of modifying or changing the product line (Coyle et al., 2003; Lucey, 2009).

2.6.3 Stock-out Costs

Lucey (2009) defines stock out cost as "the costs associated with running out of stock". Coyle et al. (2003) also asserts that it is the cost of not having product available when a customer demands or needs it. When an item is unavailable for sale, a customer may accept a back order

for future availability of the needed product, or perhaps purchase (or substitute) a competitor's product, directly taking profit from the firm experiencing the stock out. If the firm permanently loses the customer to its competitor, the profit loss will be indirect but longer lasting. On the physical supply side, a stock out may result in no new materials or in semi-finished goods or part, meaning idle machine time or even shutting down an entire manufacturing facility. Determining the cost of not having an item available for sale, however, may be much more challenging. For a company dealing with raw materials or supplies for a production line, a stock out may mean wholly or partially shutting down operations. Such operations cutbacks are particularly critical for firms involved in just –in – time manufacturing or assembly operations.

According to Lucey (2009), stock out costs include lost contribution through the lost sale caused by the stock out, loss of future sales because customers may go elsewhere, cost of production stoppages caused by stock out of work-in-progress and raw materials, and extra costs associated with urgent, often small quantity, replenishment orders. Lucey (2009) further asserts that stock out cost may be difficult to quantify. The avoidance of stock out cost is the basic reason why stocks are held in the first place.

2.6.4 Cost of the Stock

Cost of the stock also called purchasing cost is the cost of the purchased item itself. These costs according to Coyle et al (2003), are buying in prices or the direct cost of production. These costs are needed to be considered when discount are available for bulk purchases, and when savings in production cost are possible with longer batch runs. If the firm purchases a part that goes into its finished product, the firm can determine its annual purchasing cost by multiplying the cost of one purchased unit (P) by the number of finished product demanded in a year (D), hence, purchasing cost is expressed as purchase * demand (PD).

2.7 Inventory control system

Inventory management and control process are very important in determining the optimum level of inventories and finding answers to the problem of economic order quality, the re-order point and safety stock (Eunice, 2011). Eckert (2012) argues that the standard operating procedures (SOPs) for inventory control consists of a step-by-step process that is easy follow and understand by the employees. These steps are inventory receiving, storage and product rotation and warehouse and inventory security. These steps also serve to hold employees accountable for

adhering to inventory control policy expectations. Creating and following an SOP is essential to managing inventory and controlling inventory costs. Even small organizations should not underestimate the effect of an inventory-control SOP.

An appropriate inventory control system, good and secure storage facilities, an appropriate quantification and selection process improves medicine availability and reduce spoilage. But what are the challenges? Appropriate inventory management at different levels of the supply chain is crucial for effective distribution from the various warehouses.

Inventory control is the process of managing inventory in order to meet customer demand at the lowest possible cost and with a minimum investment. Several objectives in inventory control such as minimize inventory investment; determine the appropriate of customer service level; balance supply and demand; minimize ordering cost and holding cost; also preservation of inventory control system (Rachmania, 2012).

2.8 Benefits for inventory control in health centres

One of the major benefits of inventory control in healthcare is controlling the losses of medical supplies and equipment. Obviously, healthcare equipment such as surgical instruments, ultrasound machines and computers are expensive to replace. There is an instance in which some individuals may take advantage to take the material for personal interest.

Another benefit of employing inventory control in healthcare facilities is to control the spread of disease. Studies proved that using functional inventory control have prevented the affliction of mad-cow disease in a certain healthcare facilities in England. In like manner, effective tracking of surgical instruments can prevent using of infected instruments to other patients. Thus, prevention of disease starts from proper execution of inventory control. In addition, both administrators and employees should adapt inventory control system in tracking the stock levels of equipment and other supplies. In this way, effective services are guaranteed once the healthcare facilities have all the necessary supplies and equipment needed. Otherwise, without using the inventory control system it would be handicap to determine which supplies and equipment are depleted and need for replenishment. Keep in mind that being once there is inadequate supplies the quality of service will be affected. In like manner, inventory control system is also important in monitoring perishable items like medications.

In this sense, it is necessary to create a precise planning of inventory control. Healthcare facilities and organizations can hire an expert to plan the inventory control. In this way, it is assured that everything will be given attention. However, there should be direct supervision of the healthcare organizations head in conducting the inventory in order to determine the actual situation f the healthcare facility. Although it would require much of your time yet it would be for the advantage of the organization. This would not only spare the organization from the cost of supplies and equipment but inventory control can also help in carrying out effective healthcare services. Make sure that the inventory control system is effectively employed (startupbizhub, 2011).

2.9 Inventory control Techniques

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

2.9.1 Economic Order Quantity (EOQ)

Economic Order Quantity (EOQ) which developed by F.W Harris in 1915 has been the most commonly used in practice. He mentioned that EOQ derives the optimal lot size for purchasing by minimizing the total operating cost. EOQ formula helps inventory manager to determine how many optimum products to buy. However, the classical EOQ model assumes such as: constant demand, constant lead time, fixed order cost per order, instantaneous replenishment, no stocks out allowed, no demand uncertainty and quantity discount aren't available. In order the above assumptions do not reflect in all situations, EOQ model must be modified in a real inventory system analysis (Rachmania, 2012).

Replenishment process also one of common practices in inventory control. Replenishment divided two types, which is continuous review and periodic review. Continuous review placed the order when the inventory declines to the re-order-point (ROP). While periodic review placed the order at regular periodic intervals. ROP also used in inventory control to seek suitable level for replenishment.

Another model in controlling inventory is safety stock. Safety stock must be considered where there is an uncertainty in demand; also safety stock is needed during the replenishment lead time when there is a mismatch between actual demand and expected demand (Rachmania, 2012).

2.9.2.Vital Essential and Non -Essential (ABC/VEN analysis)

The ABC Inventory Control System is applied by those firms that have to maintain several types of inventories. Ideally, it is not desirable to keep the same degree of control over all the inventory types, since each vary in terms of its value of annual consumption (http://businessjargons.com, 2017).

ABC/VEN-analysis used for the investigation represents the simple and effective method of analysis of medicine expenditures, identifying priority groups of medicines, the use of which, when improved, may provide the greatest clinical and economic impact. ABC analysis provides an accurate and objective picture of budget expenditures on medicines. VEN-analysis helps to prioritize between various medicines in their selection for procurement and use within a drug supply system. "When assigning VEN categories of medicines we used expert method", comments Lilia Ziganshina, Head of the Department of Basic and Clinical Pharmacology at Kazan Federal University", "the assignment of categories was carried out by clinical pharmacologists after reviewing all available evidence on effectiveness, safety and cost-effectiveness compared to other drugs in this group".

Sometimes there are insufficient funds to buy all the desired medicines. VEN analysis is a well-known method to help set up priorities for purchasing medicines and keeping stock. Drugs are divided, according to their health impact, into vital, essential and non-essential categories. VEN analysis allows medicines of differing efficacy and usefulness to be compared, unlike ABC and therapeutic category analyses, where only drugs of similar efficacy or action can be compared. Vital drugs (V): potentially life-saving or crucial to providing basic health services Essential drugs (E): effective against less severe but significant forms of disease, but not absolutely vital to providing basic health care Non-essential drugs (N): used for minor or self-limited illnesses; these may or may not be formulary items and efficacious, but they are the least important items stocked Managing Drug Supply et.al (1997).

The items of high value are categorized as “A” and generally consist of 15%-25% of inventory items; that accounts for 60%-75% of annual usage value. The firm keeps strict control over these inventory items. The Category “B” is comprised of those items that are of relatively less value or

has moderate importance and consists of 20%-30% of inventory items that accounts for 20%-30% of annual usage value. A reasonable control is kept on the "B" category inventory items. The least important items of the inventory are categorized as "C". It consists of 40%-60% of inventory items; that accounts for 10%-15% of annual usage value. Due to a low value of these items, a simple or an ordinary control is kept on them. Thus, the ABC Inventory Control System focuses on significant items of the inventory and hence is also called as "Control by Importance and Exception." Since the categorization of the inventory items is done on the basis of their relative value, this approach is often known as "Proportional Value Analysis." (http://businessjargons.com, 2017).

2.9.3. Just-in-time (JIT)

Just-in-time (JIT) is one of the most talked about topics in materials planning primarily due to its tremendous success in the context of Japanese companies. JIT or zero-inventory system is an idealized concept of inventory management wherein we are able to supply whatever material is required, wherever required, and whenever required just in time with 100 % supply assurances without keeping any inventory on hand. Obviously, from the resource management point of view, nothing can be better than this, as there are no inventories, no shortages, and no replenishment orders placed. However, this concept necessitates that the suppliers (vendors) are local and are 100 % dependable; orders splitting with small orders without additional transportation costs is feasible, i.e., frequent deliveries are economically viable, and the requirements are firmly known. This also calls for a single vendor base and having long-term relationship with the vendor who has to be a quality vendor. This also requires that the vendor has sufficient capacity to supply anytime without passing on the costs of overcapacity to the buyer (Springer India, 2014).

2.9.4. Vendor Management Inventory (VMI)

A vendor managed inventory system (VMIS) helps in minimizing the company's holding of stock and forces the distributor to maintain goods which in turn secures the level of service of the retailer. Zer and Wei (2006) argue that vendor inventory management can be described as supplier managed inventory or as continuous replenishment. According to Beamon et al (2006) the system is an initiative of partnering that encourages cooperation and the sharing of information between partners in a business. Davila et al., (2009) explain that bar coding is a type identification employed by the technology of capturing information. Bar codes are used in

tracking items such as stock in retail, records, people and machines. Some control systems used for inventories apply this technology in order to make stock tracking automatic this improves on efficiency and thus supply chain performance (Njoroge, 2015).

2.9.5 Material Requirement Planning (MRP)

According to fuller (2003) states that material requirement planning is a scheduling procedure for production process that have several levels of production given information describing the production requirement of several finished goods of the system, the structure of the production system, the current inventory for each operation and the lot sizing procedures for each operation, MRP determines a schedule for the operation and raw material practice. Robert W (2002) states that the main function of Material requirement planning is to guarantee material availability that is it used to procure or produce the requirement quantities on time both for internal purpose and for sale and distribution. This process involves the monitoring of stock and in particular, the automatic creation of procurement proposals for purchasing and production.MRP tries to strike the best balance possible between optimizing the service level and minimizing costs and capital lock up (Eunice, 2011).

2.10 Physical Inventory Management

A physical inventory is a “wall-to-wall” count of your warehouse so map it in advance. Create a map indicating the location of every shelf, pallet rack and all other places where material is stored. One of the best ways to increase accuracy is to assign counters by area in the warehouse rather than product lines. (It is more difficult to account for misplaced material when counting by product line).

Make sure all inventory is clearly identified and located in its assigned location. If you have multiple locations for the same items, consolidate them into as few locations as possible. By combining smaller quantities into larger aggregated units, you reduce their counting time. Preparation also includes a through clean-up. Clean up (lots of sweeping, aggregating and organizing) before you count (Smartturn, 2014).

2.11 Benefits of Inventory Counting

Anybody who has ever planned or participated in an inventory count knows what a frustrating, tedious and time consuming activity it can be. The actual process of counting requires you to

remove employees from their regular jobs for hours, if not, days in every inventory location. Depending on your warehouse operation, this could affect shutdowns in other parts of your business such as manufacturing. While the frustration of counting every item, and hunting for items and material that are nowhere to be found or, once found, unidentifiable, can be acute, the organizational value of stock accuracy is taken into consideration.

Whether through cycle counting or conducting an annual tally, the accuracy of your inventory data enables your sales, customer service and financial management systems to operate much more efficiently and effectively. Your annual count confirms what you actually have in stock and then adjusts your database records to reflect reality. Do the on-hand product quantities in your computer reflect what is actually on the shelves in your warehouse? If your buyers or sales personnel make replenishment decisions or customer promises using inaccurate stock balances, mistakes will happen. When your database indicates less stock than there actually is, you'll end up ordering sooner than necessary and more than you require. You commit capital to products you don't currently need. When your database indicates more stock than there actually is, you may not re-order in time and produce a stock-out. To help avoid both of these undesirable results as well as satisfy tax obligations and financial and insurance requirements, you need to account for the cost of your inventory (www.software4manufacturers.com, 2009).

2.12 Technology and counting materials

How you choose to count may require investing in some technology such as bar code readers. If you choose the old school method of paper, you'll still need to buy necessary supplies (such as pencils, pens, markers, stickers, clip boards, calculators, scales, and the food and drinks to fuel the counters). Buy all of these items in advance.

Depending upon what material handling equipment you already have in your warehouse, you may also have to rent or borrow equipment such as pallet jacks, forklifts, and ladders. Automation during inventory can appreciably increase accuracy of your data entry, shorten counting time, decrease costs if you use outside auditors, and reduce your shut down period (Smartturn, 2014).

1. Bar code readers

These are probably your best choice to automate your annual inventory. You can download data captured by readers directly into your computer system, eliminating opportunities for data entry

clerical errors. If bar code is your technology of choice, make sure to affix bar code labels to all cartons. These labels should include an ID number, item description, unit of measurement, and quantity. The counter scans the item, and enters the unit of measure and quantity. Open cartons are manually counted, with the tally entered into a handheld computer (Smartturn, 2014).

2. Counting Card

If you are using paper, you are either using count (index) cards or counting sheets. The typical count card method prior to the actual day is to place one in each bin that needs to be counted. Counters progress through their assigned counting areas and note quantities on each card. Providing each counter with a supply of blank cards enables them to note incorrectly stocked material which then can be quickly relocated to its proper location following the count (Smartturn, 2014).

3. Count Sheets

This is as old as old school gets. Up to 25-30 inventory items are listed on each page. Organize the items by location area and number the pages in the order they be counted. Use count sheets with caution if you have no other alternative because data entry errors tend to increase (Smartturn, 2014).

2.13 Types of Inventory counting

You can either do a periodic physical inventory count, which is usually an annual event, or you can implement a cycle count program. There are two ways:-

1 Counting Once/Annual physical count

On the surface, physical counts provide a measure of reassurance to your financial auditors. However, one-time annual physical counts are expensive, and can shut down production or shipping functions for one or more days. There are some important downsides to physical counts, which include the temptation to cut corners. In many ways, a one-time annual count such as this often introduces new errors that may not be found for several months.

This is particularly aggravated if you are counting on a day-off like a Saturday and no one wants to be there. There is also the time consuming task of planning the physical inventory.

You've got to take many things into consideration –how many counting teams are required, how many man-hours it will take to get the job done, how much overtime you are willing to impose

on your team on their day off, how many recounts are required, how much equipment is needed, whether you have enough gear or material, how much food you will need to buy and if that isn't enough to keep you busy, have you planned out strategies for "no-shows" and do you have enough instructions for everyone to understand what to do? (www.software4manufacturers.com, 2009).

2 Counting Many Time/ cyclic physical count

In contrast, cycle counting, when properly implemented and managed, delivers more accurate inventory data. According to the American Production & Inventory Control Society Online Dictionary, cycle counting is: "An inventory accuracy audit technique where inventory is counted on a cyclic schedule rather than once a year.

A cycle inventory count is usually taken on a regular, defined basis (often more frequently for high-value or fast moving items and less frequently for low-value or slow moving items). Most effective cycle counting systems require the counting of a certain number of items every work day with each item counted at a prescribed frequency. The key purpose of cycle counting is to identify items in error, thus triggering research, identification, and elimination of the cause of the errors." The elimination of errors is one of the benefits of auditing inventory accuracy and choosing to reconcile errors on a cyclical schedule rather than annual. Organizations that implement cycle counting increase the probability of highly accurate real-time merchandises inventory (Smatrturn, 2014)

2.14 Empirical literature

In Nigeria poor planning and forecasting, insufficient information about consumption and current stock levels, funding and capacity constraints and a poor infrastructure are reasons for inappropriate stock levels Transaid, et.al (2010). Public warehouse infrastructure in Nigeria consists of NLMS, DLMSs and HCs, whereas challenges increase further down the supply chain. In Nigeria there are eight NLMSs, which struggle with moisture, leaking ceilings, roofs, drains or taps, inappropriate cold storage capacity Federal Ministry of Health et.al (2010) and non-existent designated areas for reception, delivery and quarantined products. However, Federal Ministry of Health (2010) states that there are special areas for the storage of dangerous and narcotic medicine, products requiring cold storage, possibilities to secure products and stores are

shaded from direct sunshine. Stock management is done manually with stock holding cards and follows the first-expired-first-out (FE-FO) strategy (Anna Schöpperle, 2013).

A study conducted in China by Jianling et al (2010) on the Analysis of inventory Management in the China enterprises reveals that, in order for organizations to maintain exuberant competitive advantages and higher profitability, they need to pay more attention on stocks control system. He adds that organizations need to adopt effective stocks control methods in their internal control system and implement scientific stocks control ways (Pallangyo, 2014).

A study conducted by Silumbe (2011) state that in Dar Es Salaam, Tanzania, shows that, despite the government efforts in ensuring availability of drugs, there is a significant stock out period due to poor pharmaceutical management of ant malarial medicines in the public health facilities. This study does not address the weakness of stocks control system and their effects on the availability of drugs and medical supplies US Agency for International Development et.al (2003).

In Namibia there is Central Medical Stores (CMS) from which health facilities are expected to order products. An assessment conducted on the CMS distribution shows that stock records were not adequately maintained and physical inventory counts did not correspond with either stock records or computerized records. It is argued the cause is that, the regional stores and health facilities had no effective systems for deciding when, what, or how much to order, most facilities ended up placing many emergency orders. (MSH2008).

In Malawi the Principal Secretary of Health Ministry et.al (2013) state that drugs stock outs was amounting to 95%. It was noted that causes were theft, tedious and bureaucratic process of procuring drugs and parallel system to purchase medication for treatment programs. The identified causes of stock outs in this case are within the stocks control system and they are revealing the weakness of the system. (Pallangyo, 2014).

The reviewed literatures show that efficient health commodities inventory management is important for health facilities to achieve their establishment objectives which are provision of health services to the community.

2.15) Conceptual Framework

Conceptual framework is a level of theory in which descriptive categories are systematically placed within a broad structure of explicit and assumed propositions, statements of relationships between two or more empirical properties to be accepted or rejected (Nachmias, 2003).

In a conceptual framework, you are required to put the concepts together as in a jigsaw puzzle, you work out how all the concepts fit together and relate to one another. The first stage of theorizing identifies and clarifies concepts; second stage concentrates on the connections and relationships between the concepts. A conceptual framework is formed of patterns of concepts and their interconnections (Fisher, et al. 2010).

It has been found that various issues contribute to proper functioning of inventory management objective in any organization, some of these variables on which inventory management depends includes, proper demand forecasting, assured lead time, proper record keeping of stock, proper inventory system, qualified personnel and proper inventory pricing technique.

The variables under this study of inventory management were related by the study in the following manner as illustrated here below

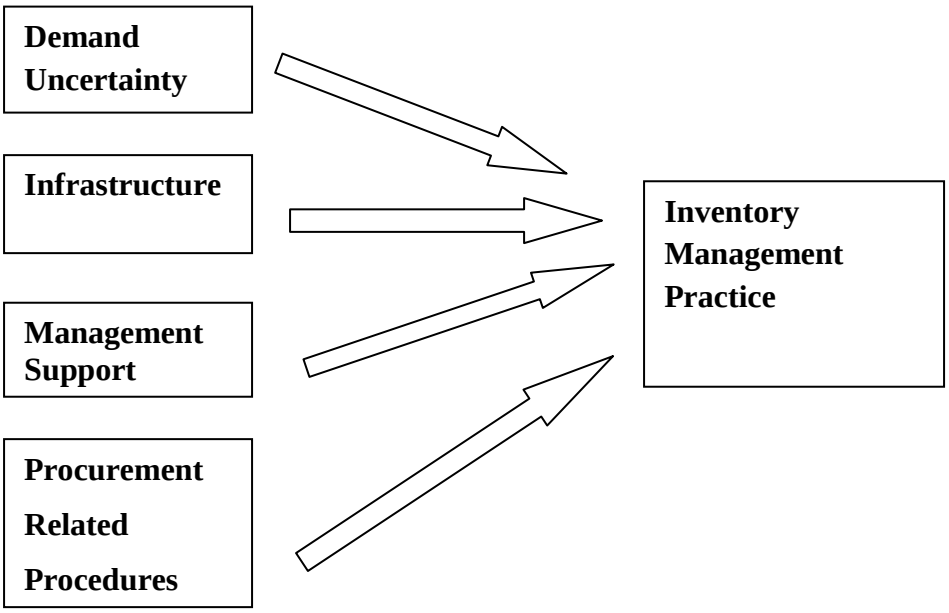

Figure 2.1) **Figure 1.1 Diagrammatic Presentation of the Relationship between Variables**

Source: Researchers perception, 2013

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Description of the study area

Gurage zone is located in south west from the capital city of Ethiopia that is Addis Ababa, around 156 K.M. Gurage zone have 21 Worda and town administration, which have 72 health centers. From the total 72 health centers 62 of them have more than two years life span and the rest 10 health centers accounts less than two years' experience as a health centers. The study has been conducted in health centers of Gurage zone administered by the respective woredas and town administration health office and zone health department.

3.2 Research Design

The researcher adopted both descriptive and explanatory research design. The main aim of descriptive design method allowed the researcher to describe the population characteristics using mean, frequency, standard deviation and percentage and explanatory design method is to identify any causal links between the factors or variables that pertain to the research problem using inferential statistics like model summary, ANOVA, regression coefficient and correlation coefficient function. Explanatory and descriptive research goes on to describe and identify reasons and causes for something that occur which is suitable to this research that aims to identify assessments of inventory management practice problem of Gurage zone health centers.

3.3 Research Approach

There are two basic approaches in social sciences research; qualitative and quantitative orientation. However, the literature suggests a growing interest in a mixed approach (triangulation) following on from the argument that 'one is used to strengthen the other. Often, combining qualitative and quantitative methods, also known as the triangulation of methods, can capture a more holistic, complete and contextual view of a phenomenon both qualitative and quantitative data collection approach were followed. Qualitative data collection approach applied to gather data through interviews & Quantitative data was gathered through questionnaires. Hence, the study conducted use a mixed research approach.

3.4 Population and Sampling

3.4.1 Target population

The study conducted were targeted staff in all categories of stratified selected professionals and manager and also randomly selected zonal health centers and health office management bodies .The target population from which the information was collected solicited by the researcher stratifiedely selected employees and management bodies as a part of this research. The target population that have been addressed by the researcher were the managerial team, store man, purchasing officer, finance team leader, nurse/health officer/doctor, laboratory technician and pharmacist in Gurage zone health centers.

3.4.2 Sampling Techniques

The study was employed a stratified sampling technique. The strata were classified in to health centers manager, store man, purchasing officer, finance team leader, nurse/health officer/doctor, laboratory technician and pharmacist in Gurage zone health centers. From the strata store man, purchasing officer, manager and finance team leader were directly/purposively selected for the research purpose because they are only one and one in number and the rest nurse, laboratory technicians and pharmacist were selected by lottery methods from the name lists of the employee already listed on the human resource departments of the health centers . So, it is important in achieving the objective of the study was targeted staff in all categories of stratified selected zonal health centers, health office and department. The target population from which the information solicited by the researcher were purposively selected employees and management bodies as a part of this research The main factor considered in determining the sample size was to keep it manageable enough and also to enable the researcher to derive from it detailed data at an affordable cost in terms of time, finances and human resource.

Base of strata	Population size	Sample size
Accounting/economics	From the strata purposively selected	41
Store/management	From the strata purposively selected	16
Other	From the strata purposively selected	7
Pharmacy	83	31
Laboratory technicians	107	40
Nurse/health officers/doctors	234	87
Total		222

3.6.3 Sample Size

A sample size is a finite part of a statistical population whose properties are studied to gain information about the whole total of individuals. The study were taken a sample by applying the formula $n=N/(1+Ne^{2)}$ where, N represent the target population , e represent the error term for management should be 0.05 and n is the sample size since it has been confirmed that such a sample size is adequate for a stratified technique. From the total of 72 health centers 10 of them were rejected from the sample because of these health centers have lesser inventory management practice with a life span of less than 2 years' experience. The target population from the 62 health centers is averagely 10 from each health centers total of 620 individual. By using the above formula the sample size was 230 individuals from these 222 respondents questionnaire were collected. The conducted research addressed Enemorena Ener(by 40 respondents), EnorEner (by 20 respondents), Cheha (by 40 respondents), Abeshige(20 respondents), and Kebena woreda (20 respondents) and also Wolkite(40 respondents), Gunchire(27 respondents) and Emdibir (15 respondents) city because of these administrations have a severe problem on inventory management practice. Data were collected from the strata of purposively selected managers, store man, purchasing expert and finance team leader and also pharmacist, nurse/health officer or doctor and laboratory technicians were selected by simple random

technique from the health centers professional and clerical employees. From the disseminated 230 questionnaire 222 of them were collected and used for analysis purpose

3.5 Data Collection Procedures

Structured questionnaire was administered to the respondents. The questionnaires were delivered by hand to the respondents at their duty stations during working hours personally and by the hands of supporting groups for my research. The questionnaires were collected after a week to give respondents enough time to answer the questions. Additionally, mini focused group discussions were undertaken especially with the zonal health department and woreda office management bodies.

3.6 Sources of Data and Data Collection Tools

Both primary and secondary sources of data were used in this research. Secondary data were used to get some raw data and like the number of health centres, employees and the past experience about the inventory management practice problems easily and primary data were used to get the real perceptions of the employees and manager on the current and to transform and analyze the data.

The study was conducted by collecting primary data by administering a questionnaire. The study was used open ended questions & closed ended questions which have five point Likert scale questions. The questionnaire which contains structured and close ended questions were responded by the health centres individual respondent (managers and employees) and open ended questionnaire was responded by the group discussion of the woreda/town office and zonal department management bodies, which serves as supportive for the findings obtained from closed ended questions.

Secondary data was used from the zonal health department and woreda health office which have readily existed. I were addressed both internal and external sources like warehouse manual, GIA audit reports, internal and external audit reports depending on the nature and scope of the information needed.

3.7 Validity and Reliability of Instruments

The structured questionnaire validity was developed through adequate coverage of the topic under investigation as per the expert advice. According to Mugenda&Mugenda (2003), expert

opinion was aimed to check the content and format of an instrument to judge validity of the content. The constructed validity were be ascertained by defining clearly the variables to be measured. According to Mugenda&Mugenda (2003), the test-retest method of assessing reliability of data involves administering the same instrument twice to the same group of subjects. To test validity of the questionnaire, conducted a pilot study with 6 persons from the stores (2) and dispensary core processors (4) on the zonal health department.

In this study, a reliability test was performed in order to see whether the study was given similar results if the same study is repeated. Reliability refers to the degree to which the instrument was given the same results if a survey is repeated on the same sample Parasuraman, Grewal & Krishnan et.al(2007: 133). To ensure reliability of this study, a Cronbach's Alpha was performed as a measure to see if the study repeats the same results if the same experiment is performed again and validity is an instrument to see if the study measures what it intended to measure. The reliability of the instruments & data was established following a pre-test procedure of the instruments before their use with actual research respondents by Cronbach's Alpha was be used to test reliability of the study.

Table3.1 Reliability Statistics

Variables Items	Cronbach's Alpha	Number of Items
Demand uncertainty	.606	5
Infrastructure	.742	7
Management support	.864	9
Procurement related procedures	.712	9
Overall reliability	.884	30

As per the above result found from the data collected from 222 respondents the overall Cronbach′s alpha score is 0.884. Nunnally, (1978) has indicated 0.7 to be an acceptable reliability coefficient, since score of 0.884 is above the standard threshold level the questionnaire were reliable.

3.8 Data Processing and Analysis

To assess inventory management practice problems, likert scale was constructed by presenting respondents with a series of different statements that reflect different aspects of each respective variable. The statements have five possible answers this including 5 for "strongly agree' or 4 for

‘agree’ or 3 for ‘neutral’, 2 for ‘disagree’ or 1 for strongly disagree’. Generally, data were described by using descriptive statistics especially frequency distribution, mean an standard deviation and inferential statistics like ANOVA, regression coefficient result and model summary were used to determine the association between the dependent and independent variable. Some data collected from respondent was described by descriptive statistics especially part one of the questionnaire that is the age distribution, gender, working experience and soon. The data was converted into a machine-readable, numeric format, such as in a spreadsheet or a text file, so as to make the data was analyzed by the supporting computer programs SPSS version 20.

The data from questionnaire and discussion was summarized, edited, coded, tabulated and analyzed using methods which were illustrated the diverse findings of the study. Information about the scores in a sample was presented in frequency tables and graphs. All tables and graphs was clearly labeled and presented so that the reader could rapidly make sense of the information contained in them. The results of the data gave the researcher a basis to make conclusions about the study.

3.9 Ethical Considerations

The study has been gather primary qualitative and quantitative data to analyze inventory management practice problems of health centers at Gurage zone. The study neither involves any experiment on human subjects nor conducted without the consent of the study participants. Above all, the researcher could not ask the study participants to engage into risks as a result of participating in this study. Besides, informed verbal consent obtained from the key respondents during data collection .All the respondents have been given the response voluntarily. All the primary and secondary data collected in the organization by the permission of the managers and without any offence in ethical rules during the whole research process.

CHAPTER FOUR

RESULT and DISCUSSION

4.1 Introduction

This chapter consists of the analyzed data and the findings that were obtained from the primary data which was collected using a semi-structured questionnaire. Data analysis was done in line with the objectives of the study which were: to assesses inventory management practice problems in Gurage zone health centers.

A total of 230 questioners were distributed to 32 pharmacist, 42 laboratory department , 25 store department head or management, 42 finance and economics department and 89 nurse/health officers were visited & all the required information were included in this study. Finally 222 questionnaires were returned but 8 questionnaires not returned which represents nearly 96.6% of the total sample size.

The findings of the study were presented to answer the leading research questions. The results are categorized according to various factors of inventory management issues dealt with in this study. Data collected through questionnaire were organized and analyzed using percentage, mean scores, standard deviation, and some inferential statistics.

According to Mugenda and Mugenda (1999) the response rate of 70% and over is excellent. Based on the assertion, the response rate was considered to be excellent.

4.2 Demographic Characteristics of Study Participants

In this section of the research report, a brief description of sample at Gurage zone health centers with respect to their personal and general information is presented.

Table 4.1 Demographic Characteristics of Study Participants

Socio demographics	Demographic characteristics	Frequency	Percent
Sex	Female	109	49.1
	Male	113	50.9
Age	Less than 18 years	4	1.8
	21-30 years	184	82.9
	31-40 years	26	11.7
	41-50 years	7	3.2
	Above 50 years	1	.5
Marital status	Single	114	51.4
	Married	108	48.6
Level of education	Certificate	18	8.1
	Diploma	101	45.5
	First degree	99	44.6
	Masters degree	4	1.8
Profession	Pharmacy	31	13.5
	Laboratory	40	18.5
	Nurse/health officer	87	39.2
	Accounting/economics	41	18.5
	Store/management	16	7.2
	Other	7	3.2
Experience	Below 1 year	55	24.8
	1-3 years	94	42.3
	4-6 years	42	18.9
	7-9 years	10	4.5
	10 years and above	21	9.5
Position on the Staff	Managerial level	39	17.6
	Senior staff	82	36.9
	Junior staff	101	45.5
Working Department	Outpatient department	40	18.0
	Laboratory	38	17.1
	Pharmacy	31	14.0
	Delivery	31	14.0
	Emergency	7	3.2
	Store	21	9.5
	Management	34	15.3
	Finance	17	7.7
	Other	3	1.4

Sex ratio

The results as shown in the table 1 above, from the total 222 respondents 109 were females (49.1%) & 113 were males (50.9%) from this the respondents on the staff working in the organization were almost one to one ratio. The proportion was almost a one to one so, it was easy to handle sex based differences.

Age in years

The respondents categories based on their age 4 respondents were less than 18 years(1.8%) , 184 respondents were between 21-30 years(82.29%), 26 respondents were between 31-40 years(11.7%), 7 respondents were between ages 41-50(3.2%) and the rest 1 respondents were above 50 years. It shows most of the employees are under the age of active working stages and eager to know additional skill and knowledge this strengthen the ability to internalize the questionnaires.

Marital status

As indicated in the table 1 marital status from the total of 222 respondents' 114 (51.4%) were single/never married; 108 (48.6%) were married. The respondents marital status were both single and married, this support to answers the questionnaire on different strata.

Educational level

The respondents were asked to show their education level. The results as shown in the table educational background of the respondents 4 (1.8%) were Master's degree holders; 99 (44.6%) were degree; 101 (45.5%) were diploma and the rest 18 (8.1%) respondents were certificate level. This means that majority of those staff in the organization had attained education up to University level and had exposure to get information easily and they were conversant with the process, therefore they were appropriate for responding to our study questions. Most of the respondents have diplomas and above diploma, this makes easy to understand the questionnaire.

Profession

The professional status of from the total of 222 respondents 30 (13.5%) pharmacy professionals, 41 (18.5%) were laboratory professionals; 87(39.2%) were Nurses/health officer's; 41 (18.5%) were accounting and economics professionals; 16 (7.2%) were store/management and the rest 7 (3.2%) respondent were others. The mixed profession of the respondents makes the study to get different views and triangulate in different perspective.

Work experience

The respondents were asked to show their work experience 55(24.8%) of respondents had less than one year's work of experience, 94 (42.3%) between 1-3 years;42(18.9%) between 4-6 years, 10(4.5%)between 7-9 years and 21 (9.5%) were greater than 10 years of experiences. This means that majority of those working in the organization had experienced and gained rich information they were conversant with the process, therefore they were appropriate for responding to our study questions. Most of the respondent working experience has above one year, this helps to respond the questionnaire from the practical experience already they have.

Position on the staff

In the position of the respondents 39(17.6%) were management level, 82(36.9%) were senior staffs, 101(45.5%) were junior staffs. This means that more than half of those respondent staff working in the organization had senior staffs and gained rich information they were conversant with the process, therefore they were appropriate for responding to our study questions.

Working department

The respondents categories on the department that specifically work 40(18%) were OPD, 21(9.5%) were store, 31(14%) were pharmacy, 38(17.1) were laboratory, 31(14%) were delivery; 7(3.2%) were emergency class; 17(7.7%) were finance; 34(15.3%) were management and the rest 3(1.4%) are other department on the staff. This means that all responsible staff of the health centers have involved in health commodities inventory management. The mixed professional department of the respondents makes the study to get different views and triangulate in different perspective

4.3 Result and discussion on inventory management practice problems

In this part of the study's report, analysis conducted on data gathered to assess inventory management practice problems in Gurage zone health department is presented in relation to the objectives of the study. Descriptive statistics was used to analyze the data in the study based on the responses of sample respondents represented by numbers 1, 2, 3, 4 and 5 and each number represent strongly disagree, disagree, neutral, agree and strongly agree, respectively. Different researches shows that scores of strongly disagree have been taken to represent a variable which had a mean score of 0 to 1.5, the scores of disagree have been taken to represent a variable with a mean score of 1.5 to 2.5, the score of neutral have been taken to represent a variable which had a mean score of 2.5 to 3.5, the score of agree have been taken to represent a variable which had a

mean score of 3.5 to 4.5 and the score of strongly agree have been taken to represent a variable which had a mean score of above 4.5.A standard deviation of >0.9 implies a significant difference on the impact of the variable among respondents. The result of my study on factors affecting inventory management practices in Gurage zone health department represented also by following the above score value. The detail findings are presented below.

4.3.1) Demand uncertainty

The first specific objective, the researcher sought to assess inventory management practice problems in Gurage zone health department was demand uncertainty. The results were presented in the table 4.2 below: Table 4.2 shows the descriptive statistics of demand uncertainty related problems on inventory management practice at Gurage zone health department based on arithmetic mean and standard deviation. In terms of the office experience demand fluctuation regularly, entrance of new competitors to the market that substitutes our service, proper forecasting experience, experience of volatility in government rule and regulations (tax, exchange rate…) and occurrence of unexpected pandemic disease or catastrophic natural phenomenon accounts the mean scores of 2.27, 2.77, 2.73, 2.56 & 2.54 respectively. The standard deviation show the spread of ideas of the respondents from the table the standard deviation ranges from 1.034 to 1.303 indicating that it is a small value thus respondents were agreeing to the same idea. Generally, based on the above concept the average mean and standard deviation of the total item of demand uncertainty represents 2.59 and 0.8 respectively, this shows that most of the respondents shows their level of agreement on neutral positions on demand uncertainty as a problems of inventory management practice at Gurage zone health center to be agrees and standard deviation indicating that it is a small value thus respondents were agreeing to the same idea. However, entrance of new competitors to the market that substitutes our service, proper forecasting experience, experience of volatility in government rule and regulations (tax, exchange rate…) and occurrence of unexpected pandemic disease or catastrophic natural phenomenon mean score 2.77, 2.73, 2.56, and 2.54 respectively which shows that neutral.

Table 4.2 Demand uncertainty related factors

Variable	Number of valid	Number of missing	Mean	Standard deviation
Our office experience demand fluctuation regularly	222	0	2.27	1.034
Entrance of new competitors to the market that substitutes our service	222	0	2.77	1.176
Proper forecasting experience	222	0	2.73	1.130
Experience of volatility in government rule and regulations (tax, exchange rate…)	222	0	2.56	1.078
Occurrence of unexpected pandemic disease or Catastrophic natural phenomenon	222	0	3.54	1.303

Source, own survey 2021

The data obtained from the respondent on the variable proper forecasting experience in the health centers shows that 72.5% respond strongly disagree, disagree and neutral. From the above data obtained proper forecasting is very important factors of among the variables in demand uncertainty. This variable was comparable with the study done in Nigeria poor forecasting are reasons for inappropriate stock levels. In addition to this, study was comparable with the study done in Malawi the Principal Secretary of Health Ministry et.al (2013) state that drugs stock outs was amounting to 95%. According to the study of Azeb Semahegn health commodities budget, supply & medical equipment stores had challenges of health commodity inventory management practices such as, no uses automated stock tracking use manually & not available written guideline. Unpredicted services demand or increased patient flow, transportation challenges, not ordering in time of needed commodities, and inadequate supply were the reasons for stock outs.

Table 4.3 Proper forecasting experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	28	12.6	12.6	12.6
	Disagree	81	36.5	36.5	49.1
	Neutral	52	23.4	23.4	72.5
	Agree	46	20.7	20.7	93.2
	Strongly agree	15	6.8	6.8	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

4.3.2) Infrastructure

From the descriptive statistics obtained from the respondent on factors of ; the health centers use information technology strictly for decision making /inventory management purpose, the health centers have a ware house constructed for store purpose, the ware house have accesses to store the materials without experience of expiration under normal condition, the ware house have well refrigerated to store in a cool and dry manner, the health center have stable energy sources to operate the machines and the health center have access to road throughout the year scores a mean of 2.68,2.57,2.69,2.61,3.38 and 2.61 and a standard deviation of 1.382,1.431,1.289,1.344,1.352 and 1.357 respectively. The health center has well equipped by materials like shelf, gear and soon scores a mean of 3.51 and standard deviation of 1.243. Generally the overall results of infrastructure were showed that a mean of 2.856 and standard deviation of 0.945. From the data collected from the respondent that we obtained with regard to the health centers use information technology strictly for decision making /inventory management purpose shows 55.9% respond strongly disagree and disagree and 7.7% respondent respond neutral. The above result were supported by the research conducted before by Welela Nacho and Azeb Semahegn with regard to utilization of information technology, majority of respondents were neutral and in disagreement that uses the existing information technology strictly for decision making. These finding concur with findings of Chaffy & Wood (2005), who found that effectiveness of an inventory management system depends on the quality of information it takes in and the capacity of the company's information technology.

Table 4.4 Infrastructure related factors

Variable	Number of valid	Number of missing	Mean	Sd.deviation
The health centers use information technology strictly for decision making /inventory management purpose	222	0	2.68	1.382
The health centers have a ware house constructed for store purpose	222	0	2.57	1.431
The ware house have accesses to store the materials without experience of expiration under normal condition	222	0	2.69	1.289
The ware house have well refrigerated to store in a cool and dry manner	222	0	2.61	1.344
The health center have well equipped by materials like shelf, gear and soon	222	0	3.51	1.243
The health center have stable energy sources to operate the machines	222	0	3.38	1.352
The health center have access to road throughout the year	222	0	2.61	1.357

Source, own survey 2021

From the data collected from the respondent that we obtained with regard to the health centers have a ware house constructed for store purpose, the ware house have accesses to store the materials without experience of expiration under normal condition, the ware house have well refrigerated to store in a cool and dry manner and the health center have access to road throughout the year the result shows about 60.4%,50.9% ,57.2% and 55.9% of the respondent response were strongly disagree and disagree respectively. The researcher results were supported by the research conducted before by Azeb Semahegn(2017) and Welela Necho Mulatu(2017) that shows there were a lack to be the health centers have a ware house constructed for store purpose, the ware house have accesses to store the materials without experience of expiration under normal condition and the ware house have well refrigerated to store in a cool and dry manner and stable access to road throughout the year . The findings from the qualitative study also stated that the existing warehouse structure is not adequate to practice modern inventory management techniques and state of the art IT to improve inventory management .The result obtained from respondent about health center have well equipped by materials like shelf, gear and soon 61.7% says strongly agree and agree with a mean scores of 3.51, this shows that this variable was not as much important for the health centers.

According to the study of Azeb Semahegn health commodities budget, supply & medical equipment stores had challenges of health commodity inventory management practices such as, no uses automated stock tracking use manually & not available written guideline. Unpredicted services demand or increased patient flow, transportation challenges, not ordering in time of needed commodities, and inadequate supply were the reasons for stock outs

Generally the responses from the respondent and a deep group discussion from the zonal management committee the health centers use information technology strictly for decision making /inventory management purpose, the health centers have a ware house constructed for store purpose, the ware house have accesses to store the materials without experience of expiration under normal condition, the ware house have well refrigerated to store in a cool and dry manner and the health center have access to road throughout the year important variable for health centers or wants a great attention and health center have well equipped by materials like shelf, gear and soon and the health center have stable energy sources to operate the machines were not as much important variable.

Table 4.5 The health centres use information technology strictly for decision making /inventory management purpose

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	54	24.3	24.3	24.3
	Disagree	70	31.5	31.5	55.9
	Neutral	17	7.7	7.7	63.5
	Agree	55	24.8	24.8	88.3
	Strongly agree	26	11.7	11.7	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

Table 4.6 The health centres have a ware house constructed for store purpose

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	65	29.3	29.3	29.3
	Disagree	69	31.1	31.1	60.4
	Neutral	14	6.3	6.3	66.7
	Agree	44	19.8	19.8	86.5
	Strongly agree	30	13.5	13.5	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

Table 4.7 The ware house have accesses to store the materials without experience of expiration under normal condition

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	48	21.6	21.6	21.6
	Disagree	65	29.3	29.3	50.9
	Neutral	35	15.8	15.8	66.7
	Agree	55	24.8	24.8	91.4
	Strongly agree	19	8.6	8.6	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

Table 4.8 The ware house have well refrigerated to store in a cool and dry manner

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	57	25.7	25.7	25.7
	Disagree	70	31.5	31.5	57.2
	Neutral	17	7.7	7.7	64.9
	Agree	59	26.6	26.6	91.4
	Strongly agree	19	8.6	8.6	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

Table 4.9 The health centres have access to road throughout the year

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	60	27.0	27.0	27.0
	Disagree	64	28.8	28.8	55.9
	Neutral	21	9.5	9.5	65.3
	Agree	57	25.7	25.7	91.0
	Strongly agree	20	9.0	9.0	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

4.3.3) Management support

The manager facilitate training for the officials to get and update their skills and knowledge , lesser stock out frequency in the organization, manager advice to experience proper purchasing frequency in health centers, manager help to apply modern information system for inventory management in health centers, health centers managements have facilitated successful deployment of inventory management systems, management devises a mechanism to create integration with key stakeholders and manager has invested enough in follow up, monitoring and evaluation of the overall inventory management activities scores mean 3.39 3.01, 2.72 , 2.66,2.55 ,2.56 and 2.59 and standard deviation of 1.295, .271, 1.209, 1.283, 1.186, 1.139 and 1.240 respectively. Manager gives attention for inventory management system and experienced management and staff on your health center have mean scores of 2.39 and 2.02 and also a standard deviation of 1.256 and 1.212 respectively. Over all management support scores a mean of 2.66 and standard deviation of 0.912.

Table 4.10 Management support

Variable	Number of valid	Number of missing	Mean	Sd.Dev
Manager give attention for inventory management system	222	0	2.39	1.256
Experienced management and staff on your health center	222	0	2.02	1.212
The manager facilitate training for the officials to get and update their skills and knowledge	222	0	3.39	1.295
Lesser stock out frequency in the organization	222	0	3.01	1.277
Manager advice to experience proper purchasing frequency in health centers	222	0	2.72	1.209
Manager help to apply modern information system for inventory management in health centers	222	0	2.66	1.283
Health centers Managements have facilitated successful deployment of inventory management systems	222	0	2.55	1.186
Management devises a mechanism to create integration with key stakeholders	222	0	2.56	1.139
Manager has invested enough in follow up, monitoring and evaluation of the overall inventory management activities	222	0	2.59	1.240

Source, own survey 2021

The response from the respondent shows that manager give attention for inventory management system ,experienced management and staff on your health center , manager help to apply modern information system for inventory management in health centers, health centers managements have facilitated successful deployment of inventory management systems, management devises a mechanism to create integration with key stakeholders and manager has invested enough in follow up, monitoring and evaluation of the overall inventory management activities were 65.3%,76.1%,55%, 56.8%,56.3% and 55.9% strongly disagree and agree responded by the respondent respectively. Whereas, the result on the variable lesser stock out frequency in the organization and manager advice to experience proper purchasing frequency in health centers obtained from the respondent shows that 58.1% and 68.9% of them respectively answered strongly disagree, disagree and neutral. The result on the variable the manager facilitate training for the officials to get and update their skills and knowledge shows about 55% of the respondent respond strongly agree and agree.

Table 4.11 Manager give attention for inventory management system

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	58	26.1	26.1	26.1
	Disagree	87	39.2	39.2	65.3
	Neutral	31	14.0	14.0	79.3
	Agree	24	10.8	10.8	90.1
	Strongly agree	22	9.9	9.9	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

Table 4.12 Experienced management and staff on your health center

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	97	43.7	43.7	43.7
	Disagree	72	32.4	32.4	76.1
	Neutral	18	8.1	8.1	84.2
	Agree	21	9.5	9.5	93.7
	Strongly agree	14	6.3	6.3	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

Table 4.13 Manager Help to apply modern information system for inventory management in health centers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	48	21.6	21.6	21.6
	Disagree	74	33.3	33.3	55.0
	Neutral	21	9.5	9.5	64.4
	Agree	64	28.8	28.8	93.2
	Strongly agree	15	6.8	6.8	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

Table 4.14 Health centres Managements have facilitated successful deployment of inventory management systems

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	44	19.8	19.8	19.8
	Disagree	82	36.9	36.9	56.8
	Neutral	38	17.1	17.1	73.9
	Agree	45	20.3	20.3	94.1
	Strongly agree	13	5.9	5.9	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

Table 4.15 Management devises a mechanism to create integration with key stakeholders

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	37	16.7	16.7	16.7
	Disagree	88	39.6	39.6	56.3
	Neutral	46	20.7	20.7	77.0
	Agree	37	16.7	16.7	93.7
	Strongly agree	14	6.3	6.3	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

Table 4.16 Manager has invested enough in follow up, monitoring and evaluation of the overall inventory management activities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	44	19.8	19.8	19.8
	Disagree	80	36.0	36.0	55.9
	Neutral	43	19.4	19.4	75.2
	Agree	33	14.9	14.9	90.1
	Strongly agree	22	9.9	9.9	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

Table 4.17 Lesser stock out frequency in the organization

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	25	11.3	11.3	11.3
	Disagree	71	32.0	32.0	43.2
	Neutral	33	14.9	14.9	58.1
	Agree	62	27.9	27.9	86.0
	Strongly agree	31	14.0	14.0	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

Table 4.18 Manager advice to experience proper purchasing frequency in health centers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	38	17.1	17.1	17.1
	Disagree	72	32.4	32.4	49.5
	Neutral	43	19.4	19.4	68.9
	Agree	53	23.9	23.9	92.8
	Strongly agree	16	7.2	7.2	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

The study result were supported by Welela Nacho (2017) this study revealed that more than half of respondents showed their disagreement that top managements have facilitated successful deployment of inventory management practice and respondents were in agreement that lack of top management support has inhibited the implementation of inventory management systems. A study by Anisa S.L. and Susan W. (2014) reported similar findings where respondent disagreed that managers have facilitated successful deployment of inventory management systems. The report obtained from Welela's research shows 68.8% their disagreement and neutral state that management devised mechanisms to create integration with key stakeholders such as Banks, Ethiopian Customs Authority and Food, Medicine and Health care Administration and Control

Authority that affects the inventory management system. Integration with key stakeholders supposed to minimize lead time and improves inventory management practice.

As indicated by the research of Daniel Demessie (2015) fifty seven point six percent respondents indicated that they were received pre/post-employment training on inventory control. The response indicated that post employment training was not a common means for preparing staff before deployment to inventory control sections in the organization. This implies that most of the staff has only the educational qualification out of inventory management area which might have an effect on efficiency of inventory control. Bailey and Farmer (1982) say that, if staff involved in stock control is not qualified and competent, then there will be ineffectiveness in inventory control. Since majority of the respondents (87.9%) agreed with the statement, it implies that staff skill and experience affects inventory control and the organization should ensure that adequately trained, experienced and qualified personnel must be employed

Generally, the result obtained from my research and Welela Nacho,Azeb Semahegn and Osei Mensah, Esther shows that management attention for inventory management practice, experienced management and staff, manager advice to experience proper purchasing frequency, manager help to apply modern information system, health centers managements have facilitated successful deployment of inventory management systems and management devises a mechanism to create integration with key stakeholders and manager has invested enough in follow up, monitoring and evaluation of the overall inventory management activities respondent response above 50% were strongly disagree and disagree. So, the variable that we mentioned by this paragraph need a great attention or those variable are very important for health centers to cop up the challenges of inventory management practice on aspects of management support.

4.3.4) Procurement related procedures

From the data obtained from the respondent on variables sufficient funds for procurement in your health center, experience of stable and proper process in procurement ,experience of purchasing of drugs with a near expiration date, lesser experience for overstocking/under stocking of health commodities, public procurement policy is supportive on implementation of inventory management system at health centers and staff competency have effect on procurement mean scores of 3.05, 2.50, 3.36, 2.52, 2.51 and 2.61 and standard deviation of 1.368, 1.290, 1.182, 1.172, 1.121 and 1.216 respectively. And also the variables short time it take your unit to receive commodities once a request has been placed , the existing pharmaceutical regulatory

policies, guidelines and procedures are suitable to practice proper procurement procedures and proper procurement planning process have mean scores of 2.45, 2.29 and 2.22 and standard deviation of 1.155, 1.050 and 1.060 respectively .Over all procurement related procedures scores a mean of 2.64 and standard deviation of 0.71.

Table 4.19 Procurement related procedures

Variable	Number of valid	Number of missing	Mean	Sd.Dev
Sufficient funds for procurement in your health center	222	0	3.05	1.368
Experience of stable and proper process in procurement	222	0	2.50	1.290
Short time it take your unit to receive commodities once a request has been placed	222	0	2.45	1.155
Experience of purchasing of drugs with a near expiration date	222	0	3.36	1.182
Lesser experience for overstocking/under stocking of health commodities	222	0	2.52	1.172
The existing pharmaceutical regulatory policies, guidelines and procedures are suitable to practice proper procurement procedures	222	0	2.29	1.050
Proper procurement planning process	222	0	2.22	1.060
Public procurement policy is supportive on implementation of inventory management system at health centers	222	0	2.51	1.121
Staff competency have effect on procurement	222	0	2.61	1.216

From the respondent response that the researcher obtained on variables short time it take your unit to receive commodities once a request has been placed the existing pharmaceutical regulatory policies, guidelines and procedures are suitable to practice proper procurement procedures ,proper procurement planning process ,experience of stable and proper process in procurement, lesser experience for overstocking/under stocking of health commodities and public procurement policy is supportive on implementation of inventory management system at health centers shows that 58.1%,65.3%,71.6%,58.6%,58.1% and 57.2% respondent were respond strongly disagree and disagree and the health centers have sufficient fund for procurement the result shows 51.4% neutral, strongly disagree and disagree. The results obtained from the

respondent on the variable experience of purchasing drugs with near expiration date were shows that 56.8 % strongly agree and agree.

Table 4.20 Experience of stable and proper process in procurement

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	56	25.2	25.2	25.2
	Disagree	74	33.3	33.3	58.6
	Neutral	40	18.0	18.0	76.6
	Agree	28	12.6	12.6	89.2
	Strongly agree	24	10.8	10.8	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

Table 4.21 Short time it take your unit to receive commodities once a request has been placed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	52	23.4	23.4	23.4
	Disagree	77	34.7	34.7	58.1
	Neutral	41	18.5	18.5	76.6
	Agree	44	19.8	19.8	96.4
	Strongly agree	8	3.6	3.6	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

Table 4.22 Lesser experience for overstocking/under stocking of health commodities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	46	20.7	20.7	20.7
	Disagree	83	37.4	37.4	58.1
	Neutral	35	15.8	15.8	73.9
	Agree	48	21.6	21.6	95.5
	Strongly agree	10	4.5	4.5	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

Table 4.23 Proper procurement planning process

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	57	25.7	25.7	25.7
	Disagree	102	45.9	45.9	71.6
	Neutral	25	11.3	11.3	82.9
	Agree	33	14.9	14.9	97.7
	Strongly agree	5	2.3	2.3	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

Table 4.24The existing pharmaceutical regulatory policies, guidelines and procedures are suitable to practice proper procurement procedures

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	53	23.9	23.9	23.9
	Disagree	92	41.4	41.4	65.3
	Neutral	43	19.4	19.4	84.7
	Agree	28	12.6	12.6	97.3
	Strongly agree	6	2.7	2.7	100.0
	Total	222	100.0	100.0	

(Source, own survey 2021)

Table 4.25 Public procurement policy is supportive on implementation of inventory management system at health centres

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	42	18.9	18.9	18.9
	Disagree	85	38.3	38.3	57.2
	Neutral	44	19.8	19.8	77.0
	Agree	42	18.9	18.9	95.9
	Strongly agree	9	4.1	4.1	100.0
	Total	222	100.0	100.0	

Source, own survey 2021

The research conducted before that support our studies were Welela Nacho (2017) public procurement policy exerted a negative influence on the procurement and inventory management practice about half of the respondents (50%) agreed or strongly agreed that public procurement policy negatively affects inventory management .The finding agrees with the Osborne et al. (2007) finding who indicated that bureaucratic organization has long procurement lead time which has significant effect on the overall inventory management. The findings of qualitative study further strengthened the idea that decision making processes and complex intra-departmental communication and planning were some of the causes of long bureaucratic procurement delays that in turn affects the effectiveness of inventory management. Some of the key informants considered absence of long term procurement agreement and occurrence of repetitive tendering as major procurement problem that affects inventory management

The findings of bureaucratic procurement procedure of the sample include: experience on long bureaucratic purchase difficulties, frequency of stock out and respondents view on whether long bureaucratic procurement procedure affects inventory control. This aspect of the analysis deals with the review of respondents on the questionnaire about bureaucratic procurement procedure in the organization. Respondents were required to tick according to how they felt about the issues of bureaucratic procurement procedure in the organization.

The research conducted before that support our studies were Daniel Demissie (2015) seventy two point seven percent (72.7%) of respondent indicated that some items of inventories were over stocked in the organization. On the other hand 27.3 % of respondents reported that inventories were not overstocked in the organization. This shows that the organization capital cost was tied up due to over stock of some items of inventories in the organization.

The research conducted before that support our studies were Azeb Semahegn(2017) shows the descriptive statistics of challenges of inventory management of health commodities inventory management practices at based on arithmetic mean and standard deviation. The variables the stock outs of essential medicine is a regular situation, experience for overstocks of health commodities, delays in delivery of drugs leading to insufficient inventories and long-time it take your unit to receive commodities once a request has been placed with mean score 3.14, 3.16, 3.22, 3.34,3.39 respectively which shows that neutral. In this study was comparable with the study done in Nigeria poor planning and forecasting, insufficient information about consumption and current stock levels, funding and capacity constraints and a poor infrastructure are reasons

for inappropriate stock levels. In addition to this, study was comparable with the study done in Malawi the Principal Secretary of Health Ministry et.al (2013) state that drugs stock outs was amounting to 95%.

As observed in Azeb's study health commodities budget, supply & medical equipment stores had challenges of health commodity inventory management practices such as, no uses automated stock tracking use manually & not available written guideline. Even the budget store available automated stock tracking but not use properly. Majority of respondent agree during interview identify the reasons for stock outs are weak selection, quantification, procurement and in adequate stock control and management, delaying of purchasing procedure, weak/unknown consumption data, limited capacity of PFSA to avail needed health commodities, shortage of budget, many work load, unpredicted services demand or increased patient flow, transportation challenges, not ordering in time of needed commodities, and inadequate supply were the reasons for stock outs. In this case was comparable with the study done in Dar Es Salaam, Tanzania that showed there is a significant stock out period due to poor pharmaceutical management medicines in the public health facilities

Table 2.26 Descriptive Statistics of average value of the whole factors

	N	Minimum	Maximum	Mean	Std. Deviation
Demand uncertainty	222	1.000	5.000	2.59459	.800208
Infrastructure	222	1.000	5.000	2.85586	.945069
Management support	222	1.000	5.000	2.66216	.911620
Procurement related procedures	222	1.000	4.000	2.64414	.721008
Factors of inventory management practice in Gurage zone health centers	222	1.000	4.331	2.67605	.580680

Inventory management problems overall accounts a mean scores of 2.676 and standard deviation of 0.58.

4.3.5) Inferential Statistical results and relationship between dependent and independent variables

A regression analysis was used to find out the statistical relationship between inventory management practices and the problems that affect inventory management practice (demand uncertainty, infrastructure, management support and procurement related procedures). The regression analysis, as provided by Cooper and Schindler (2006), is a technique for establishing the statistical relationship between the independent and dependent variables. This relationship is established by the multiple linear regression model as presented on the table 4.27 Inventory management practice (Y) was explained by = 0.183 (B_0=constant)+0.236(B_1) Demand uncertainty + 0.197($B_{2)}$ Infrastructure + 0.284($B_{3)}$ Management support + 0.212(B_4) + 0.043(Error term) . Different management sciences say demand uncertainty, infrastructure, management support and procurement related procedures have positively related with inventory management practice. So, our beta values are all positive value this shows the model were specified correctly because it passed first order economic criteria.

Interpretation for table 4.27 :- this shows 0.183 is the amount of inventory management practice when there is no managing problems of inventory management practice, a one unit increase in managing demand uncertainty increase the efficiency of inventory management by 0.236 on average keep in constant, a one unit increase in managing infrastructure increase the efficiency of inventory management by 0.197 on average keep in constant , a one unit increase in managing management support increase the efficiency of inventory management by 0.284 on average keep in constant and a one unit increase in managing procurement related procedures increase the efficiency of inventory management by 0.212 on average keep in constant.

Table 4.27 Regression coefficient result

Coefficients[a]

Model		Un standardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.183	.043		4.257	.000
	Demand uncertainty	.236	.013	.325	18.850	.000
	Infrastructure	.197	.012	.321	16.802	.000
	Management support	.284	.012	.446	23.603	.000
	Procurement related procedures	.212	.014	.264	15.084	.000

a. Dependent Variable: Factors of inventory management practice in Gurage zone health centers

From the result presented at table 4.27 shows that explained sum square (regression) greater that of the residual sum square (residual) this shows the model is relatively good to explain the relationship and the variable was statistically significant at 1% level of significance.

Table 4.28) Analysis of variance

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	70.523	4	17.631	957.511	.000[b]
	Residual	3.996	217	.018		
	Total	74.519	221			

a. Dependent Variable: Factors of inventory management practice in Gurage zone health centers

b. Predictors: (Constant), Procurement related procedures, Infrastructure, Demand uncertainty, Management support

From the data presented in table 4.28 shows R^2 of 0.945 this result implies that the model fit the data well because the economic model criteria says for cross sectional data for the values of R^2 greater than 0.5 represent the model fit the data well. From the data on the table shows 94.6% the factors of inventory management practice were explained by the variable on this study and the rest 5.55% factors were not addressed by this study and significant at 5% of level of significance. R stands for correlation coefficient indicates the relationship between the independent and dependent variables. Based on the results of Table 4.8, there is a strong and

positive relationship between dependent variable (inventory management practices) and independent variables (Demand uncertainty, Infrastructure, Management support and procurement related procedures as illustrated by a correlation coefficient of 0.973.

Table 4.29 Model summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.973[a]	.946	.945	.135695

a. Predictors: (Constant), Procurement related procedures, Infrastructure, Demand uncertainty, Management support

Correlation coefficient result

As shown in the table 4.30 below, based on a survey of 222 respondents from the officials at the selected health centers of Gurage zone, a bivariate Pearson product moment correlation analysis is run and shows the following result:

There is an overall inventory management performance relation with the remaining variables (r=0.973). Specifically, overall inventory management practice with demand uncertainty is positively correlated (r=0.618); with infrastructure is a strong positive correlation (r=0.738); with management support is a strong positive correlation (r=0.774) and with procurement related procedures is positively correlated significantly (r=0.62) and all the factors are significant at 1% level of significance.

Table 4.30) Correlation Function Result

		Demand uncertainty	Infrastructure	Management support	Procurement related procedures
Pearson Correlation	Demand uncertainty	1.000	.335	.221	.329
	Infrastructure	.335	1.000	.516	.296
	Management support	.221	.516	1.000	.346
	Procurement related procedures	.329	.296	.346	1.000
Sig. (1-tailed)	Factors of inventory management practice in Gurage zone health centers	.000	.000	.000	.000
	Demand uncertainty	.	.000	.000	.000
	Infrastructure	.000	.	.000	.000
	Management support	.000	.000	.	.000
	Procurement related procedures	.000	.000	.000	.
Number of respondent	Factors of inventory management practice in Gurage zone health centers	222	222	222	222
	Demand uncertainty	222	222	222	222
	Infrastructure	222	222	222	222
	Management support	222	222	222	222
	Procurement related procedures	222	222	222	222

Source own survey, 2021

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1) Introduction

This chapter presents a summary of key data findings, conclusions drawn from the findings highlighted and recommendations made there-to. The conclusions and recommendations drawn focused on assessing problems inventory management practice of Gurage zone health centers.

5.2) Summary of findings

5.2.1) Demand uncertainty

The first specific objective, the study sought to assess the problems for inventory management practice in Gurage zone health department was demand uncertainty. The results shows the descriptive statistics of demand uncertainty related variable in terms of the office experience demand fluctuation regularly, entrance of new competitors to the market that substitutes our service, proper forecasting experience, experience of volatility in government rule and regulations (tax, exchange rate…) and occurrence of unexpected pandemic disease or catastrophic natural phenomenon accounts the mean scores of 2.27, 2.77, 2.73, 2.56 & 2.54 respectively. The standard deviation show the spread of ideas of the respondents from the table the standard deviation ranges from 1.034 to 1.303 indicating that it is a small value thus respondents were agreeing to the same idea.

Generally, based on the above concept the average mean and standard deviation of the total item of demand uncertainty represents 2.59 and 0.8 respectively, this shows that most of the respondents shows their level of agreement as neutral on demand uncertainty as a problems of inventory management practice at Gurage zone health center to be agrees and standard deviation indicating that it is a small value thus respondents were agreeing to the same idea. However, entrance of new competitors to the market that substitutes our service, proper forecasting experience, experience of volatility in government rule and regulations (tax, exchange rate…) and occurrence of unexpected pandemic disease or catastrophic natural phenomenon mean score 2.77, 2.73, 2.56, and 2.54 respectively which shows that neutral. From the data obtained from the

respondent on the variable proper forecasting experience in the health centers shows that 72.5% respond strongly disagree, disagree and neutral. From this proper forecasting experience is very important factor for demand uncertainty and inventory management practice.

5.2.2) Infrastructure

From the descriptive statistics obtained from the respondent on factors of ; the health centers use information technology strictly for decision making /inventory management purpose, the health centers have a ware house constructed for store purpose, the ware house have accesses to store the materials without experience of expiration under normal condition, the ware house have well refrigerated to store in a cool and dry manner, the health center have stable energy sources to operate the machines and the health center have access to road throughout the year scores a mean of 2.68,2.57,2.69,2.61,3.38 and 2.61 and a standard deviation of 1.382,1.431,1.289,1.344,1.352 and 1.357 respectively. The health center has well equipped by materials like shelf, gear and soon scores a mean of 3.51 and standard deviation of 1.243. Generally the overall results of infrastructure were shoed that a mean of 2.856 and standard deviation of 0.945. From the data collected from the respondent that we obtained with regard to the health centers use information technology strictly for decision making / inventory management purpose shows 55.9% respond strongly disagree and disagree and 7.7% respondent respond neutral and 63.5% respondent respond strongly disagree, disagree and neutral. From the data collected from the respondent that we obtained with regard to the health centers have a ware house constructed for store purpose, the ware house have accesses to store the materials without experience of expiration under normal condition , the ware house have well refrigerated to store in a cool and dry manner and the health center have access to road throughout the year the result shows about 60.4%,50.9% ,57.2% and 55.9% of the respondent response were strongly disagree and disagree respectively and this shows the variables were very important for infrastructure and inventory management practice.

5.2.3) Management support

The manager facilitate training for the officials to get and update their skills and knowledge , lesser stock out frequency in the organization, manager advice to experience proper purchasing frequency in health centers, manager help to apply modern information system for inventory management in health centers, health centers managements have facilitated successful

deployment of inventory management systems, management devises a mechanism to create integration with key stakeholders and manager has invested enough in follow up, monitoring and evaluation of the overall inventory management activities scores mean 3.39 3.01, 2.72 , 2.66,2.55 ,2.56 and 2.59 and standard deviation of 1.295, .271, 1.209, 1.283, 1.186, 1.139 and 1.240 respectively. Manager gives attention for inventory management system and experienced management and staff on your health center have mean scores of 2.39 and 2.02 and also a standard deviation of 1.256 and 1.212 respectively. Generally the overall results of management support were showed that a mean of 2.662 and standard deviation of 0.9116.

The response from the respondent shows that manager give attention for inventory management system ,experienced management and staff on your health center , manager help to apply modern information system for inventory management in health centers, health centers managements have facilitated successful deployment of inventory management systems, management devises a mechanism to create integration with key stakeholders and manager has invested enough in follow up, monitoring and evaluation of the overall inventory management activities were 65.3%,76.1%,55%, 56.8%,56.3% and 55.9% strongly disagree and agree responded by the respondent respectively. Whereas, the result on the variable lesser stock out frequency in the organization and manager advice to experience proper purchasing frequency in health centers obtained from the respondent shows that 58.1% and 68.9% of them respectively answered strongly disagree, disagree and neutral. The result on the variable the manager facilitate training for the officials to get and update their skills and knowledge shows about 55% of the respondent respond strongly agree and agree. So, this shows manager give attention for inventory management system ,experienced management and staff on your health center , manager help to apply modern information system for inventory management in health centers, health centers managements have facilitated successful deployment of inventory management systems, management devises a mechanism to create integration with key stakeholders and manager has invested enough in follow up, monitoring and evaluation of the overall inventory management activities were very important variables and the result on the variable lesser stock out frequency in the organization and manager advice to experience proper purchasing frequency in health centers somewhat important and manager facilitate training for the officials to get and update their skills and knowledge is not important variable for the health centers.

5.2.4) Procurement related procedures

From the data obtained from the respondent on variables sufficient funds for procurement in your health center, experience of stable and proper process in procurement ,experience of purchasing of drugs with a near expiration date, lesser experience for overstocking/under stocking of health commodities, public procurement policy is supportive on implementation of inventory management system at health centers and staff competency have effect on procurement mean scores of 3.05, 2.50, 3.36, 2.52, 2.51 and 2.61 and standard deviation of 1.368, 1.290, 1.182, 1.172, 1.121 and 1.216 respectively. And also the variables short time it take your unit to receive commodities once a request has been placed , the existing pharmaceutical regulatory policies, guidelines and procedures are suitable to practice proper procurement procedures and proper procurement planning process have mean scores of 2.45, 2.29 and 2.22 and standard deviation of 1.155, 1.050 and 1.060 respectively . Generally the overall results of procurement related procedures were shoed that a mean of 2.644 and standard deviation of 0.721.

From the respondent response that the researcher obtained on variables short time it take your unit to receive commodities once a request has been placed the existing pharmaceutical regulatory policies, guidelines and procedures are suitable to practice proper procurement procedures ,proper procurement planning process ,experience of stable and proper process in procurement, lesser experience for overstocking/under stocking of health commodities and public procurement policy is supportive on implementation of inventory management system at health centers shows that 58.1%,65.3%,71.6%,58.6%,58.1% and 57.2% respondent were respond strongly disagree and disagree and the health centers have sufficient fund for procurement the result shows 51.4% neutral strongly disagree and disagree. The results obtained from the respondent on the variable experience of purchasing drugs with near expiration date were shows that 56.8 % strongly agree and agree.

From the respondent response that the researcher obtained on variables short time it take your unit to receive commodities once a request has been placed the existing pharmaceutical regulatory policies, guidelines and procedures are suitable to practice proper procurement procedures ,proper procurement planning process ,experience of stable and proper process in procurement, lesser experience for overstocking/under stocking of health commodities and public procurement policy is supportive on implementation of inventory management system at

health centers variables were very important for procurement related procedures and inventory management practice.

5.3) Conclusion

The study concludes that that inventory management is a process that is continuous in the organization and therefore there is always need for managing inventory management practice problems that facilitate to have good inventory management can lead to good performance in an organization.

When we came to the conclusions with respect to the findings of the research study, demand uncertainty related factors are important in order to have a good inventory management practice. From the various factors that we addressed in the questionnaire and group discussion from the key informants seasonal change /natural hazard/phenomenon and lack of proper forecasting experience are very important variables for demand uncertainty related problems that affect to have a good management practices. Entrance of new competitors to the market is not as much important for inventory management at Gurage zone health centers because of most the health centers are located in rural. In the rural areas maximum of one or two private clinic have a chance to enter to the market, so these clinic have not a potential to serve the society. From the data obtained from key informant's group discussion, there is a serious challenge to get the chemicals, vaccines and medicine at the occurrence of pandemic diseases like Yellow fever and diarrhea soon .So; in order to have a good inventory management practice the health centers should give a great attention.

From the study that we have obtained shows that to have a good inventory management practice the health centers must addresses the issue of infrastructures related variable From the data collected from the respondent that we obtained with regard to the health centers have a ware house constructed for store purpose, the ware house have accesses to store the materials without experience of expiration under normal condition , the ware house have well refrigerated to store in a cool and dry manner and the health center have access to road throughout the year the result shows about 60.4%,50.9% ,57.2% and 55.9% of the respondent response were strongly disagree and disagree respectively and this shows the variables were very important for infrastructure and inventory management practice. Finally most of the variables that the study addressed by this

research on the infrastructure related problems are very important to have a good inventory management practice.

From the management support perspective the respondent the questionnaire and group discussion from the key informant's management did not invest enough to enhance the inventory management practice. They noticed serious gaps in standardizing and enforcing procedures for better management of inventory, the existing information system do not get the full support of senior management. Generally the study concluded that health centres of Gurage zone have a problem of the manager to give attention for inventory management system ,lack of experienced management and staff , manager lack initiation to help to apply modern information system for inventory management, a problem of the managements have facilitated successful deployment of inventory management systems, a problem of management devises a mechanism to create integration with key stakeholders and a problem manager has invested enough in follow up, monitoring and evaluation of the overall inventory management activities. The manager advice to experience proper purchasing frequency on health centres somewhat important. From the responses obtained from the group discussion there is a gap on properly managing essential , vital and non essential medicine and other equipment that were donated from the non - governmental organization.

When we conclude the procurement related procedures from the respondent response that the researcher obtained on variables long time it take your unit to receive commodities once a request has been placed , the existing pharmaceutical regulatory policies, guidelines and procedures are problematic to practice proper procurement procedures ,improper procurement planning process ,experience of unstable and proper process in procurement, higher experience for overstocking/under stocking of health commodities and public procurement policy is unsupportive on implementation of inventory management system at health centers.

The final conclusions from the result obtained for the study at Gurage zone health centres were in order to have a good inventory management practice we must address properly the issue of demand uncertainty, infrastructure, management support and procurement related procedures.

5.4 Recommendation

Based the findings of this study, the following recommendations are forwarded for Gurage zone health departments and other concerned bodies.

First when we come to the demand uncertainty issues the health centers/department need to improve their forecasting experiences and adjusting their inventory level on the behavior of the seasonal change. Secondly when we come to the issues of infrastructures the health centers/ department should have to improve the information management practice to modern one, improve ware house construct standard, improve ware house to have accesses to store the materials without experience of expiration under normal condition, improve the ware house to have well refrigerated to store in a cool and dry manner and improve the health centers to have access to road throughout the year. Thirdly when we come to the management support issues improving competency level of management and employees, improve management attention for inventory management, improve the management attention for successful deployments of inventory management practice, improve integration with key stakeholders and improve the attention of the manager towards proper purchasing practice. Fourthly the researcher recommendation with the issues of procurement related procedures are a need for to improve a time it take your unit to receive commodities once a request has been placed ,improvement of the existing pharmaceutical regulatory policies, guidelines and procedures that is unsupportive on implementation of inventory management system , improvement of procurement planning process ,improvement of unstable and proper process in procurement, improvement of experiencing for overstocking/under stocking of health commodities and improvement public procurement policy that is unsupportive on implementation of inventory management system at health centers by integrating with the key stake holders. Finally, the health centers management and employees , the woreda health offices , the zonal health department and other concerned bodies should work cooperatively to improve the overall inventory management practice by improving the variables mentioned above.

5.4 Suggestion for Further Studies

As indicated by predictive power of the model, almost most of the factors inventory management practice has been properly accounted by this study. Due to the scope of the study the relationship of factors of inventory management practice with that of the service delivery status of the health centers were not be properly addressed and also how to solve the challenges faced by the inventory management practice . It is therefore suggested that further research should be done to

further explore the relationship between inventory management practice and service delivery status and how to solve the challenges of inventory management practices of the health centers.

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Annex I Questionnaires

WOLKITE UNIVERSITY COLLEGE OF BUSINESS AND ECONOMICS DEPARTMENT OF MANAGEMENT SURVEY QUESTIONNAIRE

This questionnaire is part of a project work required by Wolkite University college of business and economics department of management as a partial requirement for the award of a Master of business administration degree. The questionnaire is designed to solicit your independent views on "Assessments of Problems Inventory Management Practices in Gurage Zone Health Center , Ethiopia, Wolkite". All information provided shall be treated as confidential and used strictly for Academic purpose. Please answer the following questions freely without indicating your name.

Thanks a lot for giving me response kindly and genuinely!!

Part one background data

1. Gender? Male ☐ Female ☐

2. Age? Less than 18 years ☐ 21 -30 years ☐ 31-40 years ☐

41-50 years ☐ 51years& above ☐

3. Marital Status: Single ☐ Married ☐ Divorced ☐ Widowed ☐

4. Level of education? Certificate ☐ Diploma ☐ First Degree ☐

Master's degree ☐ other, please specify……..

5. Profession: Pharmacy ☐ Laboratory ☐ Nurse /Health officer ☐ Accounting or Economics ☐ Store/ management ☐ Other, please specify …….

6. Your position on staff? Managerial level ☐ senior staff ☐ junior staff ☐

Other, please specify …….

7. Which department of the health centers do you work? OPD ☐ Laboratory ☐ Pharmacy ☐

Delivery ☐ Emergency ☐ Stores ☐ Management ☐ Finance ☐ If other,

Please specify …….

8. How long have you worked in the health centers? Less than 1years ☐ 1 – 3 years ☐

4 – 6 years ☐ 7 – 9 years ☐ 10 years and above ☐

Note: - For question from part two to part five there have five choices. Which of them are 5) strongly Agree represented by (SA) 4) Agree represented by (A) 3) Neutral represented by (N) 2) Disagree represented by (D) and 1) Strongly Disagree represented by (SD)

Part two a question related to demand uncertainties						
		SA [5]	A [4]	N [3]	D [2]	SD [1]
1.	The health center experience demand fluctuation regularly					
2.	Low entrance of new competitors to the market that substitutes our service					
3.	Better proper forecasting experience					
4.	Experience of low volatility in government rule and regulations (tax, exchange rate…)					
5.	Occurrence of high unexpected pandemic disease or Catastrophic natural phenomenon					

For part two question mention other challenges that cannot be addressed by the table

……

……

…….....

.....

Part three a question related to infrastructure						
		SA [1]	A [2]	N [3]	D [4]	SD [5]
1	The health centers use information technology strictly for decision making /inventory management purpose					
2	The health centers have a ware house constructed for store purpose					
3	The ware house have accesses to store the materials without experience of expiration under normal condition					
4	The ware house have well refrigerated to store in a cool and dry manner					
5	The health center have well equipped by materials like shelf, gear and soon					
6	The health center have stable energy sources to operate the machines					
7	The health center have access to road throughout the year					

For part three question mention other challenges that cannot be addressed by the table

……

……

……

……

……

Part four a question related to management support						
		SA [1]	A [2]	N [3]	D [4]	SD [5]
1	Manager give attention for inventory management system					
2	Experienced management and staff on your health centre					
3	The manager facilitate training for the officials to get and update their skills and knowledge					
4	Lesser stock out frequency in the organization					
5	Manager advice to experience proper purchasing frequency in health centres					
6	Manager help to apply modern information system for inventory management in health centers					
7	Health centers Managements have facilitated successful deployment of inventory management systems					
8	Management devises a mechanism to create integration with key stakeholders					
9	Manager has invested enough in follow up, monitoring and evaluation of the overall inventory management activities					

For part four question mention other challenges that cannot be addressed by the table ……
…….

Part five a question related to procurement related procedures						
		SA [1]	A [2]	N [3]	D [4]	SD [5]
1	Sufficient funds for procurement in your health centre					
2	Experience of stable and proper process in procurement					
3	Short time it take your unit to receive commodities once a request has been placed					
4	Experience of purchasing of drugs with a near expiration date					
5	Lesser experience for overstocking/under stocking of health commodities					
6	Proper procurement planning process					
7	The existing pharmaceutical regulatory policies, guidelines and procedures are suitable to practice proper procurement procedures					
8	Public procurement policy is supportive on implementation of inventory management system at health centers					
9	Staff competency have effect on procurement					

For part five question mention other challenges that cannot be addressed by the table ……
…….

Annex II Group Discussion Questionnaires/Guidelines

Group discussion guiding questions for Woreda/Town health office and Zonal health department management

A. What are the current challenges/ factors affecting of inventory management practice at the health centres of Gurage zone/Woreda/Twon administration:

In terms of:-

1.) Demand uncertainties……

2.) Infrastructures……..

3.) Management support……

4.) Procurement related procedures……

5.) Mention if there is an additional factors …….

B). How the zonal department , woreda and town administration support, follow up , monitor, evaluate and take a corrective action to minimize the challenges ……
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C.) What do you think are the possible interventions to resolve the current problems in terms of

1.) Demand uncertainties……..

2.) Infrastructures……

3.) Management support……

4.) Procurement related procedures……

5.) Mention other mechanisms for other factors ----------
