AFRICA UNIVERSITY
(A United Methodist-Related Institution)

THE CHALLENGES OF USING PAPER BASED INVENTORY
MANAGEMENT SYSTEM AT NYANGA DISTRICT HOSPITAL,
MANICALAND

BY

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A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF
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Abstract

All around Zimbabwe most health facilities still use manual paper systems for the different activities however, a few hospitals have begun to use computerized systems. The purpose of this study was to evaluate the major problems that are faced by staff at Nyanga District Hospital when using the current system in order to find and provide solutions so that everyone can benefit from an improved system. The cross sectional descriptive study was carried out at Nyanga District Hospital and qualitative data was used to come up with research findings. With a response rate of 74%, 96% of the 25 respondents showed their awareness of inventory management and its effect on service delivery. Of the 25 respondents, 100% stated that the system was time consuming and 40% of those respondents stated discrepancies in the inventory records as another problem. Another response from 60% of the respondents was that updates on available inventory were not frequent and absent. 68% of the 25 respondents also stated that there are sudden stock outs. The main solutions posed were extending storage space at the hospital which was chosen by 24% of the respondents as a first option and limiting the number of personnel that enters stores and has access to records which was suggested by 20% of the respondents. Computerizing the system, improving the signage at the hospital and generating a weekly report of all available inventory that would be distributed throughout departments were the next suggested solutions with 16% voting for computerization and weekly reports as a main option and 12% suggesting improving signage. Backing up inventory records externally was also suggested by 8% of the respondents. These findings indicate the need for in house training and betterment of staff at hospitals so they can embrace new systems which should be implemented regularly because a system should never stay stagnant.

Keywords: Challenges; Manual inventory management system; Solutions,

Declaration

I, Ashleigh Sithulisiwe Petronella Mawire, do hereby declare that this dissertation is the result of my own investigation and research, except to the extent indicated in the Acknowledgments, References and by comments and citations included in the body of the report, and that it has not been submitted in part or in full for any other degree to any other university.

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Acronyms and Abbreviations

AUREC - Africa University Research Ethics Committee

MoHCC - Ministry of Health and Child Care

NDH - Nyanga District Hospital

HR - Human Resources

JIT - Just In Time

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CHAPTER 1 INTRODUCTION

1.1 Introduction

An inventory control and management system is a system that encompasses all aspects of managing a company's inventories; purchasing, shipping, receiving, tracking, warehousing and storage, turnover, and reordering (Micheal, 2019). According to studies by Landry and Beaulieu (2013), supply management is seen as a target to improve hospital financial and clinical performance. A manual inventory system allows business owners and employees to physically verify that inventory is available (Lister, 2017). However, there are disadvantages and problems with this system that are worthy of investigation.

Most research in the healthcare industry has been directed towards workflow and information development systems and despite some of these papers being related to the inventory management techniques, it is very important to study their adaptation to the reality of hospitals (Nabais, 2009). The aim of this study is to investigate and analyse the challenges that are faced at Nyanga District Hospital with the use of the paper based inventory control system that is used in the stores department. The study will examine the specific barriers to efficiency and possibly how they can be removed.

1.2 Background of the study

Stores Management is the receiving, protection, issuing and recording of inventory in the right quantities, at the right time, to the right place and to provide these services promptly and at minimum cost. Good inventory management is a crucial part of management that has been recognized by operation managers around the globe. A company can reduce costs by proper inventory management (Rosalan, 2013). Existing research studies have investigated solutions to optimize the flow of information and inventory around and outside health facilities to eliminate unnecessary costs and improve efficiency.

A strategy was developed by Duangpun Kritchanchai to improve healthcare logistics and they focused on inventory management, information and technology management. Eighteen case studies of public and private hospitals in five different countries showed that hospitals perform badly against these two criteria. These results showed the weaknesses in manual inventory systems and the need to pay close attention to the inventory and information technology system used to manage their daily operations (Ageron et al, 2018).

Joseph (2013), after carrying out studies, advocated that there are two factor weaknesses of the manual inventory system which are labour-intensive and human error. It can be highly labour intensive to operate using a manual inventory system. They need continuous monitoring to ensure that each transaction can be explained. It is also more difficult to share information about inventory because lack of computing makes finding inventory records more troublesome (Rosalan, 2013). A manual inventory system also depends heavily on a person, which increases the possibility of human error. This is all according to the research that has been done before in the area.

1.3 Statement of the problem

Compared to manufacturing, the health sector lags behind in the utilization of the benefits that could be derived from effective inventory management (Long, 2005; Singh, 2006). All around Zimbabwe most health facilities still use manual paper systems for the different activities however, a few hospitals have begun to use computerized systems. Some local hospitals have been able to work with the resources they have to improve their management systems. For example, Hauna hospital in Mutasa has begun to use computers for their activities. However, it is still limited to accounting and human resources together with basic communication. The rest of the world has moved from manual and paper based systems and Zimbabwe is lagging behind.

This paper based system has several problem factors. For starters paper cards are easily damaged and can also be easily lost. The paper based system is also time consuming and not very systematic. It is difficult to keep a backup of the inventory records and it also takes up space in the storage rooms. There is mishandling of paper records by the stores personnel and the rest of the hospital staff which results in torn and spoiled stock cards or in extreme cases loss of the stock card which translates to loss of relevant stock records. Sometimes the records on the stock cards do not match with the physical count. Also invested stakeholders have no way of finding out whether the things they need are available in the stores departments.

The purpose of this study is to evaluate the major problems that are faced by staff at Nyanga District Hospital when using the current system in order to find and provide solutions so that everyone can benefit from an improved system. The study includes evaluating the problems faced and the consequences of the problems. A survey will be conducted among the stores staff and user departments.

1.4. Research Objectives

1.4.1 Broad objective

This research seeks to investigate the problems of using paper based manual inventory control systems in the stores department at Nyanga District Hospital.

1.4.2 Specific Objectives

This study seeks:

1. To identify the users that are involved in inventory management and the inventory management procedures at Nyanga District Hospital

2. To ascertain the relationship between inventory management and service delivery at Nyanga District Hospital

3. To collect information on limitations of the existing inventory system in ordering, receiving, recording and distributing of inventory to the user departments at Nyanga District Hospital

1.5 Research Questions

1. How many and which user departments are involved in inventory management at Nyanga District Hospital and what are the procedures used?
2. What is the relationship between inventory management and service delivery at Nyanga District Hospital?
3. What are the major limitations of the existing inventory system in ordering, receiving, recording and distributing inventory to the user departments at Nyanga District Hospital?

1.5 Significance of Study

This study will be primarily aimed at increasing efficiency in operations at Nyanga District Hospital. It seeks to aid in reducing maintenance and running costs. It will also look at monitoring the supply of inventory and the distribution among the relevant user departments, without sacrificing productivity. It will provide the hospital staff and stores department with adequate information about the challenges of their existing system and will give recommendations on how to counter these problems.

It will provide higher security for inventory inside the stores departments and in the user departments and will help hospital management to plan for procurement and optimize the resources available. The findings will also be useful to hospital and health centre administrators in reviewing how they have carried out inventory management in their respective health units and how to make improvements where necessary.

This study will provide a deeper look at the advantages of a computerized system against those of the system and will help policy makers in the Ministry of Health and Child Care come up with a national inventory system for the purpose of planning and improving on inventory management for effective service delivery in health units. This research will fill a gap and usher the health system of the country into a new era from which it was previously falling short.

It will offer a simpler look into inventory management systems which can be contextualized to developing countries like Zimbabwe and this research will benefit other researchers who would want to look into simple management of inventory. The finding from this study is to serve as reference for future researchers for any person that would like to conduct research on the same as similar area.

1.6. Delimitation of the study

The study will be conducted at Nyanga District Hospital mainly focusing on the challenges faced by staff using the paper based inventory management system. It is going to focus on store department workers and the user departments as well as the administration within the scope of the hospital and not on outsiders or other stakeholders who have an indirect interest. In content the study will focus on inventory management and the level of service delivery in health units.

1.7 Limitations of the study

Based on the approach used in getting information, some members of staff might not give honest responses but rather what's expected of them by the institution. The cadres might be biased towards the stores department staff and may exaggerate the problems they face when receiving inventory from stores. Likewise, if the cadres have close relationships with the administration and stores staff they may inflate the benefits of the existing system and productivity levels resulting in false data. Participants lacking full knowledge of the importance of this task might lack interest in the exercise and might give excuses such as being busy and might respond with random answers for the sake of it.

1.8 Summary

The chapter looked at the introduction of the research topic. It also looked at the background information of how the problem emerged and how it has been dealt with so far and the problem statement in which it highlighted some of the problems. Other research components such as research questions, objectives, limitations and delimitations were also discussed. The next chapter will be focusing on literature review concerning the research topic in question.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

Past research works and suggestions of different researchers are very important in any research. Even though research relating to this study has become difficult to find, it is imperative to acknowledge the works that have been written on the area in question and their effect on knowledge about the topic. In this chapter the theoretical and empirical bases of inventory control management will be reviewed. This chapter has the purpose of reviewing past research efforts that relate with the problem of using manual records for inventory control systems. The main purpose is to establish the information gap between what has previously been researched and what the research is concentrating on.

2.2 Literature review in relation to objectives

2.2.1 Theoretical Framework
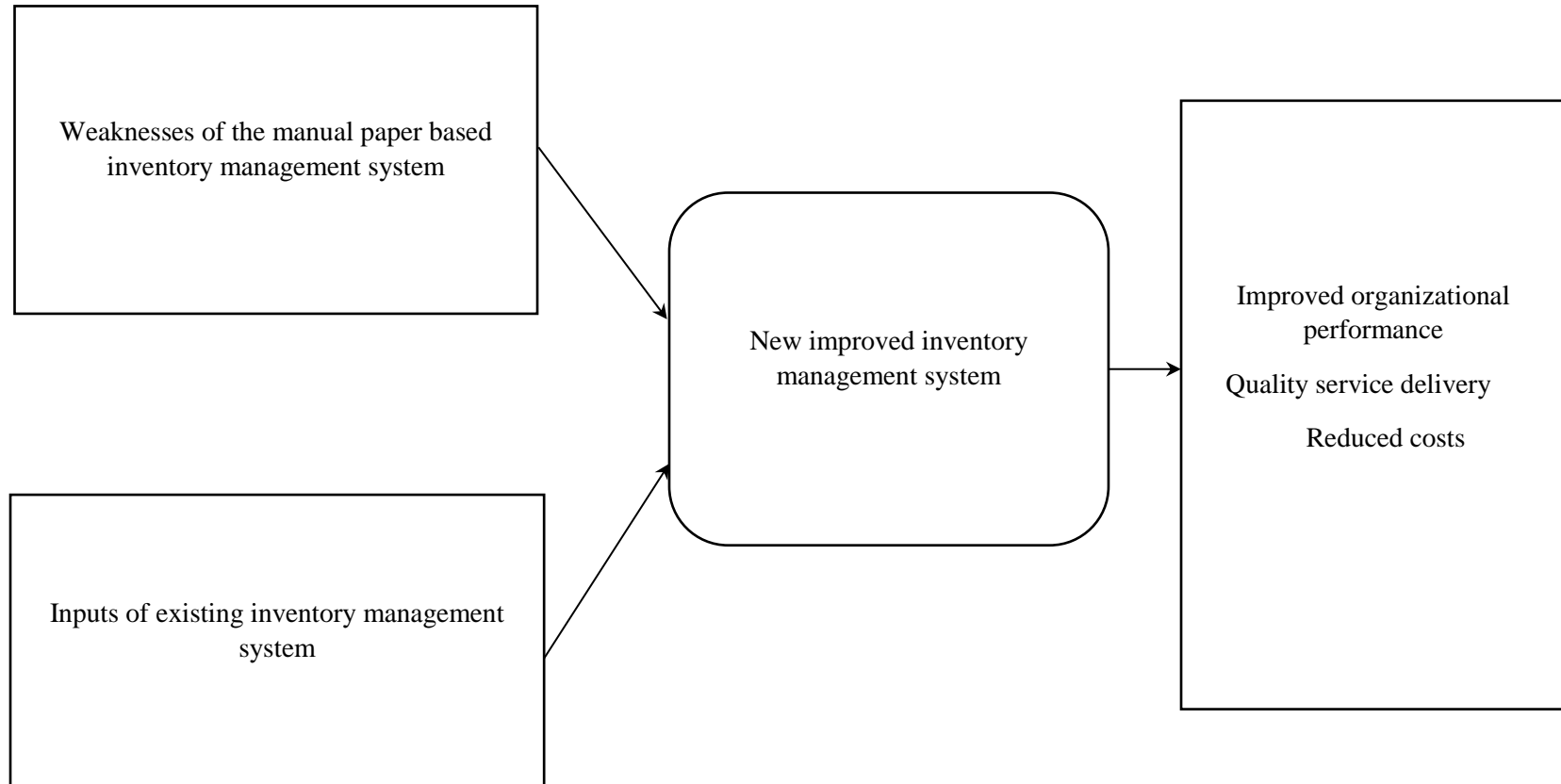
Figure 1 Theoretical Framework

2.3 Definition of inventory

It is important to clearly define what inventory is in order to get a deeper understanding of the variables involved in this study. Inventory has been defined in many ways. According to Reph G & Milner C (2015) "inventory is the stock of any item held in an organization".

Ballou, (2004) states that the inventories are stockpiles of raw materials, suppliers, components, work in process, and finished goods that appear at numerous points throughout a firm's production and logistics channel. In other words, (Chase, Aquilano, & Jacobs, 2005) believe that inventory is the stock of any item or resource used in an organization. In the case of Nyanga District Hospital inventory/ stock refers to food items, drugs, donations, stationery, hardware and mechanical parts, fuel, medical equipment to mention a few types.

2.3.1 Importance of inventory management for the organization

Studies performed on inventory management in hospitals have been limited and hence less is known about what is precisely being followed in practice (Volland, 2017). Existing literature has focused more on establishing optimal inventory policies based on the system conditions at a given point in time.

An inventory system can be defined as a set of policies used to control when, how much and how inventory should be replenished. Tom, Akhilesh and Sijo (2013) explained inventory control as the most important function of inventory management and that it forms part of the nerve centre in any inventory management organization. De Vries et al. (2011) and Varghese et al. (2012) realized the potential to save money in the healthcare supply chain and concluded that much needs to be accomplished with respect to developing an efficient system.

The Dynamics of the hospital is such that the system conditions change over time and the established inventory policies require re-evaluation after a certain period of time. Documenting all activities in inventory management is critical. Creating accurate records reduces the likelihood of discrepancies that may occur in many activities that take place in the store room. In this way, the pharmacy staff and the administration have information necessary for decision making (Ombaka, 2009).

A proper information system allows for the identification of bottlenecks in the facility system (Ombaka, 2009). Inventory management plays an important role in matching demand and supply in the entire supply chain management and by providing flexibility in coping up with external and internal events of the today's uncertain globalized business environment (Croxton, 2002).

Inventory management plays an important role as far as the success of a business is concerned. Health institutions such as public Hospitals should always value the need to effectively manage inventory as failure to do so can result in poor service delivery and

can put the lives of people at stake. Effective inventory management can result in a decrease in cost and ineffective inventory management can cause cost to increase.

Inventory management systems obtain and move supplies and equipment to places where they are needed in a timely manner and at an optimum cost. Supplies and equipment usually cannot go directly from their source to the end user. They frequently must be held in the stores rooms along the way (Nyakeri & Ochiri, 2014), In view of this warehouse of supplies maintained and inventory of supplies and equipment are held at all levels in the Zimbabwe Health Service. The inventory management system recognizes that staff at all levels have a wide range of responsibilities (USAID, 2013).

2.3.2 Manual Inventory Control Systems

A manual system offers a number of potential advantages and disadvantages. Poor inventory management is evidenced by inaccurate stock records, lack of systematic monitoring of the stock, and undefined procedures on ordering frequency and quantity, which are linked to lack of knowledge of the meaning of inventory management, as well as inefficient and ineffective management (MSH, 2012).

Joseph (2013) advocates that there are two factor weaknesses of the manual inventory system which are labour-intensive and human error. It can be highly labour intensive to operate using a manual inventory system. They need continuous monitoring to ensure that each transaction can be explained. It is also more difficult to share information about inventory because lack of computing makes finding inventory records more troublesome.

A manual inventory system also depends heavily on a person, which increases the possibility of human error. The person may perform a wrong calculation but with a computerized system errors can be minimized. Time spent monitoring inventory levels could be used on activities more productive for the business. (Joseph,2013).

The person may forget to record a transaction or count the wrong number of items. This decision on additional orders need not increase inventory costs of the company and use valuable storage space. Physical calculation of inventory can also result in not ordering a product, meaning business could run out of a single item criticality at the wrong time.

Kakeeto (2003) stated the problems that exist with manual inventory record systems as being inconsistencies incurred when entering products into stock cards increasing volumes of stationery used, making it hard for the workers to identify the stock cards in time.The above literature material shows the problems of the manual systems.

2.3.3 Computerization of inventory systems

Over the years computerization of manual systems has taken over and the literature below shows how, why and the factors affecting computerization. The automation of the inventory system will hence help managers make the right decisions because information will be rightly available and in a correct format. Computerizing your inventory system brings you the potential for improving sales and profits through better analysis of inventory trends, including patterns of delivery and demand. (Kidunge, 2009).

2.4 Conclusion

This chapter outlined some of the literature that is relevant to this study. This was done by reviewing literature which addresses the problem statement of the research. The chapter was made up of literature on the general understanding on the problems of using a manual inventory system and the impact of inventory management practices on service delivery in public hospitals in Zimbabwe. The next chapter is going to look at the research methodology

CHAPTER 3 RESEARCH METHODOLOGY

3.1   Introduction

A manual inventory system allows business owners and employees to physically verify that inventory is available (Lister, 2017). However, there are disadvantages and problems with this system that are worthy of investigation. This study aims to investigate the challenges of using the manual inventory management system at NDH.

This chapter describes the research design that will be used, along with the population being studied and the sampling procedures that will be used when collecting and analyzing data collected. It also describes the instruments that will be used to ensure validity and reliability of instruments that will be used in the study. Furthermore, it will also describe the ethical considerations to protect study participants.

3.2   Research Design

The research being carried out is an applied non experimental research study. It will be a cross sectional descriptive study in nature and will use qualitative data to come up with research findings. A survey study will be conducted aiming to illustrate the incidence of all forms of challenges faced when using the manual paper based inventory control system at Nyanga District Hospital, as well as contributing factors and impact. In the study, an observational method will also be used to check for inventory availability, discrepancies and store management at one specific point in time.

This study will also use retrospective data to allow the researcher to answer questions on completeness of stock records and historical stock outs. These methods are best served to answer the questions and the purposes of the study. This type of methodology also fits the small number of research participants.

3.3 Study Setting

The study will be carried out at Nyanga District Hospital which has 198 employees and has at least 60 beds capacity for patients. Nyanga District Hospital is a state owned hospital operating under the ministry of Health and Child Care. It is located in Nyanga district, Manicaland province in the north eastern part of the country Zimbabwe.

The languages spoken at Nyanga District Hospital are Shona and English so the study can be carried out in both languages. The study will be carried out on the ground at the hospital during active work hours. Below is a map of the location of Nyanga District Hospital.

Figure 22 Map showing Nyanga District Hospital

3.3   Study Population

A population is a group of individuals that have the same characteristic(s). Nyanga District Hospital has 208 employees and at any given day there are about 50 employees on duty and on the ground at the hospital. The target population for this research is defined to include the users and managers of the manual inventory system at Nyanga District Hospital. This includes the stores personnel, the administration and the user departments of the inventory management system. In this study, the accessible population comprises all the available staff on duty at Nyanga District Hospital at the time of the study who use the inventory management system. The employees and the management will form part of

the population because they are the ones involved in the day to day activities of inventory at the hospital.

3.5 Inclusion Criteria

Members of staff at Nyanga District Hospital will be included in the research study. The study will include both administrative and clinical staff at the hospital. Support staff from the stores department will also take part in the study, this includes the general hands who work in the stores department.

3.6 Exclusion Criteria

The research study will exclude all members of staff who do not have EC numbers and are therefore not officially under employment of the Ministry of Health and Child Care. The study will also exclude members of staff that do not use the inventory management system. Members of staff who are not registered on duty at the hospital will also be excluded from the study.

3.7 Sample Size

The Sampling Universe is the population defined above, that is the 50 employees present at any working day of Nyanga District Hospital. The researcher will work with 34 members of staff from the 4 main departments at Nyanga District Hospital: administrative,

support, clinical and stores department and the most likely to be helpful will take part in the study. The total sample size is 34.The calculation of the sample size is as follows:

Yamane's Formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where: e = precision level

and N = population size.

SS= 50/ 1+50(0.10)2

   SS= 34

3.8 Sampling Technique

The study hinges on subjects being able to give information on the stores department so Non-probability quota sampling method will be used to come up with a sample size. This means that selection of study subjects will be non-random. Staff at Nyanga District Hospital will be grouped into males and females. Then convenience sampling will be used to pick subjects from the clusters. Staff that is available and on duty at the hospital will be included in the study.

3.9 Study Instrument

The researcher will use in person interviews to collect data from the subjects at Nyanga District Hospital (see Appendix iii), which will be aimed at eliciting relevant information

concerning inventory management practices and the challenges that staff face during the process at Nyanga District Hospital. Questions relating to the process, perceived problems of the manual management system as well as possible strategies that could be adopted to enhance efficiency will be asked. To get quality information questions will be open ended and closed ended.

The questions asked have been designed using Likert scale questions and other structured questions that require selection and simple yes/no answers. Structured questions will also be asked. Inventory records and reports will also be looked at to get information on past inventory management practices. The content of the instrument is partly based on the literature reviewed.

Reliability of an instrument refers to the extent to which the technique is consistent or dependable in measuring any object. A reliable instrument should produce precise and stable results.   When validity is low, then the conclusions, propositions or recommendations that we make from our study have no strength. This requires the instrument used in gathering data to be tested and tried before it is used (Mohajan, 2017). Therefore a pilot test on the questions and interviews on respondents will be done.

3.10 Pilot Study

A pilot study will be carried to assess the reliability of the study instruments. The researcher will conduct five short interviews in the focal department which is the

administration department. The quality of the responses will be measured against existing literature and standards to assess the reliability and validity. The result of the pilot study will be used to fix errors on the study instrument.

3.11 Data Collection

After conducting the pilot test and making sure the instrument being used is reliable, permission will be gotten from the relevant authorities to carry out the final research. Consent forms will be given to the study subjects in accordance with ethical standards for research that require a study subject to be willing and well informed of the study they are taking part in.(see appendix iv).

There will be no incentives or rewards for taking part in the study and the participants will be made aware of this. Subjects will be asked questions using the question guideline below. A total of thirty four subjects will be interviewed as part of the study at NDH during work hours over a period of two days and after that period is over the answers will be analyzed.

3.12 Data Analysis

The data will be analyzed using Microsoft Excel and Content analysis. The software was chosen because of its ease of accessibility to the researcher and it is easier to use with small sample sizes. Data will be presented in descriptive form by organizing and

presenting it by means of tables. Content analysis will allow the raw information to be reduced and significant patterns will be revealed and will be done in the following steps:

Step 1: Data will be transcribed, whereby a written version of an interview will be created and data will be organized into easily retrievable sections.

Step 2: Familiarization of information

Step 3: Important points will be highlighted with different highlighters.

Step 4: Patterns and connections between and within categories will be identified.

Step 5: Interpretation of findings.

3.13 Ethical Consideration

Researchers are expected to behave ethically in all areas of conducting research. Ethical Principles include; The right to Voluntary participation, Informed consent, Exclusion from the risk of harm, Confidentiality and Anonymity. Permission to carry out the research will be sought from the Ministry of Health and Child care , that is the District Health Executive. A request for the permission to conduct the research will be submitted to the Africa University Research Ethics Committee (AUREC). Informed consent will be sought using a consent form.

3.14 Summary

This chapter indicates how the research is going to be carried out and describes the purpose of the study, the research methods to be adopted, the instruments to be used where and

how data will be collected, and the types of data to be collected. This chapter describes mechanisms to enhance validity and reliability of the study findings and proposed presentation of qualitative data. The chapter also outlines and stresses the ethical considerations to safeguard the study participants.

CHAPTER 4 DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents the research findings, analysis and interpretation of the findings. The chapter consists of the response rate of the respondents and also shows analysis of the results using different pictorial figures. Secondary data collected in Chapter two will be used to discuss the results on manual inventory management at Nyanga District Hospital. This will help to answer the research questions of the study.

4.2 Data Presentation and Analysis

Thirty four (34) selected sample respondents were asked questions pertaining to the efficacy and challenges of the manual inventory management system at NDH, most of the questions were answered. The interviews were conducted with the assistance of the Dental therapist. Accordingly, all the data gathered is presented, analyzed and interpreted in the next pages.

4.2.1 Response Rate

4.2.1 Table 2 shows response rate of the interviews carried out at Nyanga District Hospital.

Respondents	Interviews intended	Interviews accomplished	Response rate

NDH staff	34	25	74%
Total	**34**	**25**	**74%**

The table above shows that the researcher directed interview questions to 34 employees. Out of the 34 employees that were approached 25 interviews were successfully conducted , giving a high response rate of 74%. This was as a result of clashing work schedules, unavailability of staff on the hospital grounds at certain times. Some employees said they had no knowledge of the systems because their peers are the ones who interact with the stores department.

4.2.2 General characteristics [1]of respondents

4.2.2 Table 1 shows the general characteristics of participants who took part in the study at Nyanga District Hospital

Characteristic	Item	Respondents in :	
		Number	**%**
Gender	Male	11	44
	Female[2]	14	56
	Total	**25**	**100**
Age (years)	Below 20	1	4
	20-30	4	16
	31-40	8	32
	41-50	6	24
	51-60	4	16
	Above 60	2	8
	Total	**25**	**100**
Educational level	Primary level	1	4
	O level	5	20

	A level	2	8
	Certificate	3	12
	Diploma	7	28
	Degree	6	24
	Master	1	4
	Total	**25**	**100**
Department	Admin	4	16
	Stores	1	4
	Accounts	2	8
	HR	2	8
	Lab	3	12
	Rehab	2	8
	Wards	2	8
	Outpatients	3	12
	Nutrition	2	8
	Pharmacy	2	8
	Environment	2	8
	Total	**25**	**100**
Experience (years)	Less than 1 year	2	8
	1 -5 years	4	16
	5 -10 years	10	40
	10 -15 years	3	12
	15 -20 years	5	20
	More than 20 years	1	4
	Total	**25**	**100**

As it can be seen from the above table, out of 25 respondents 14(56%) are females and the

rest 11(44%) are females. With regard to their age in years, 4% is between the age range

of 18-20, 16% are between 21-30, 32% are between 31-40, 24% are between 41-50, 16%

are between 51-60 and the rest which is 8% fall under the age range of 60 and above. This

shows that the majority of them are females and age wise they are mostly found in their

productive age.

Concerning their level of education only 1 person (4%) has a masters degree, 24% are first degree holders, the rest (72%) only have diplomas, certificates and high school level education. So one can say that the respondent's level of education is lacking when compared to current working conditions and changes in inventory management systems. Additional education or training would be vital to improve the management systems.

4.2.3 Awareness of inventory management at Nyanga District Hospital

Some of the questions asked were pertaining to the existence of an inventory management system at the hospital and its effect on the management of the whole hospital and service delivery at NDH. From the responses to the various questions it can be concluded that there is a manual management system at the hospital and the staff is aware of it. This can be shown below:

4.2.4 Inventory management systems used at Nyanga District Hospital

The researcher asked various workers from different departments which systems they used and the responses are shown on the table below

4.2.4 Table 3 shows inventory management tools elements used at Nyanga District Hospital, Manicaland

Department	System being used	Usage
Stores	Bar-code system	-
	CCTV	-

	Computerized stock records(Database software)	-
	BIN/Stock Cards/Stores Requisition	Yes
	Backup copy of master inventory book	-
	Paper stock cards	Yes
	Stock Card System	Yes
Pharmacy	Medicines Management Information System (MIS)	Yes
Fuel	Coupon System	Yes
	Use of drums for fuel storage	Yes
	Refueling from filling stations	Yes
	Computerized fuel management system	-
Other departments	Paper records	Yes
	Computerized records	-

The above table shows the elements of inventory management used across the different departments that deal with inventory at Nyanga District Hospital. The table shows paper stock cards as the main tool used at the hospital. The system is manual and involves no computers or databases.

The table below shows that 96% of the respondents agreed that inventory management practices contribute greatly to service delivery and affect the efficiency of the hospital as a whole, only 4 % did not agree. The results are illustrated below;

4.2.4 Table 4 shows Respondents opinion on effect of inventory management on hospital service delivery at Nyanga District Hospital

Response	Valid percentage
Agreed	96%
Disagreed	4%
Total	**100%**

4.2.5 Efficacy of Inventory management systems used at Nyanga District Hospital

Another question asked was :To what extent is the Paper stock card and manual inventory control system that is used in the Stores department at Nyanga District Hospital effective and unproblematic?
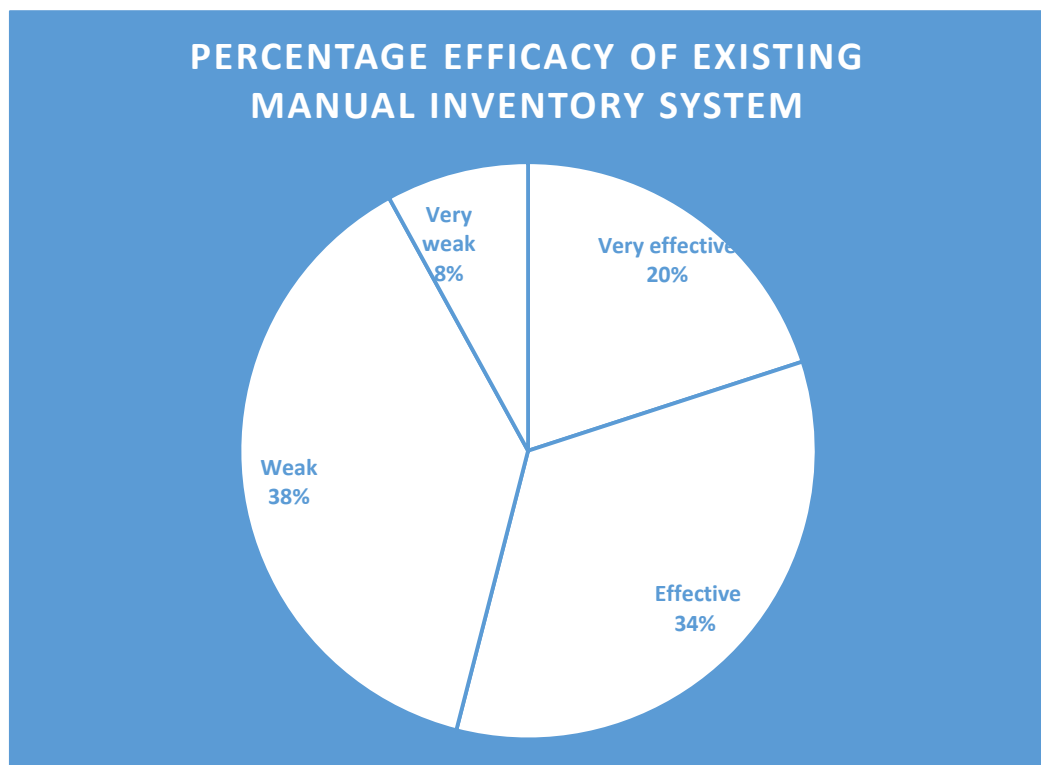
Figure 3: Efficiency of manual inventory system

As shown on the pie chart a large percentage of respondents (38%), said the existing inventory management process was weak and problematic. However a close 34% said the

system was efficient and unproblematic. This margin shows that a large representation of NDH staff prefers the system as it is.

4.2.6 Problems and challenges of using the manual Inventory management systems at Nyanga District Hospital

Problems of paper based system
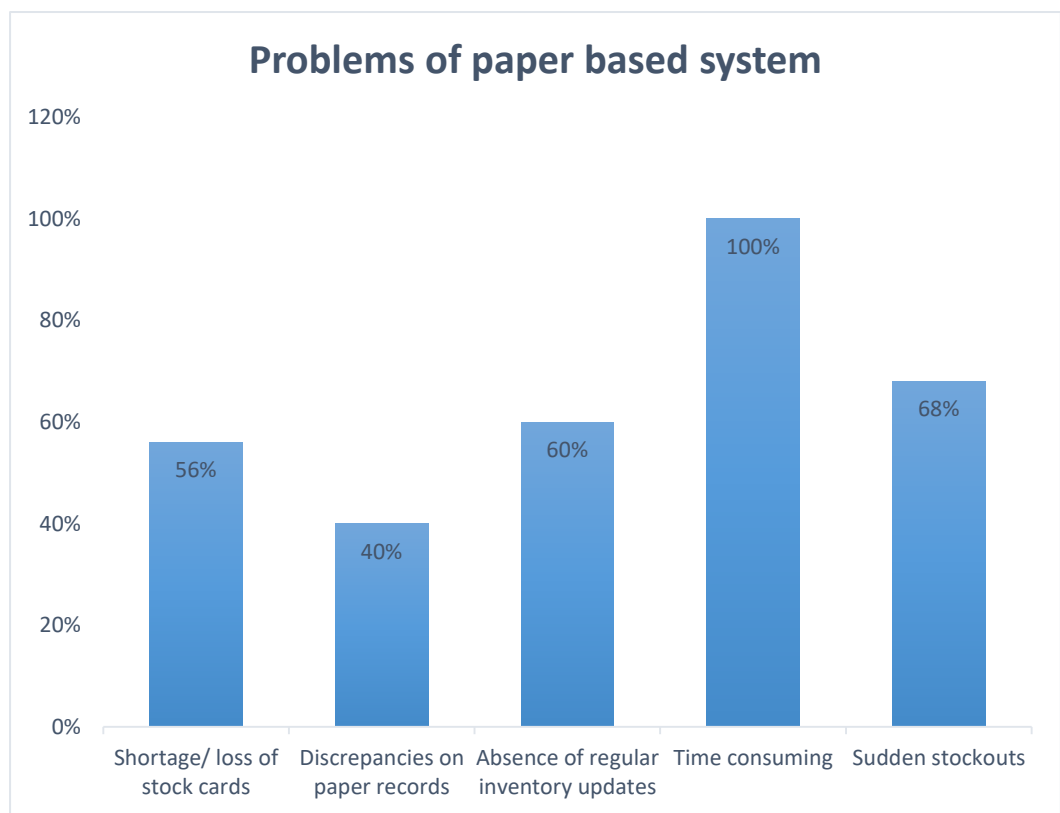
Figure 4 Problems of the manual inventory management system at NDH

Shown above are the main problems and challenges faced by staff at NDH caused by using the manual paper based inventory management system which mainly features use of stock cards and books as registers.Those who agreed were in track with the observations of

Brooks et al (2007). Poor inventory management is proved by inaccurate stock records or discrepancies, shortage of systematic monitoring of the stock, and indefinite procedures on ordering rate and quantity, which are linked to insufficient knowledge of inventory management, as well as ineffective management (Matowe et al., 2008).

Of the 25 respondents, 100% stated that working with paper stock cards was time consuming and 40% of those respondents stated discrepancies in the inventory records as another problem. 60% of the respondents stated that updates on available inventory were not frequent and absent. 68% of the 25 respondents also stated that there are sudden stock outs as a result of the absence of real time inventory updates and use of databases to keep track of available inventory. 56 % of the 25 respondents stated shortage/ loss of the stock cards in the store's rooms.

Other challenges/problems faced by the NDH staff include : the manual records can be manipulated and inventory can be stolen, some departments can monopolize and hoard inventory as they have access to the manual records, paper records can be burnt,stained and are not durable

4.2.7 Possible solutions to the problem
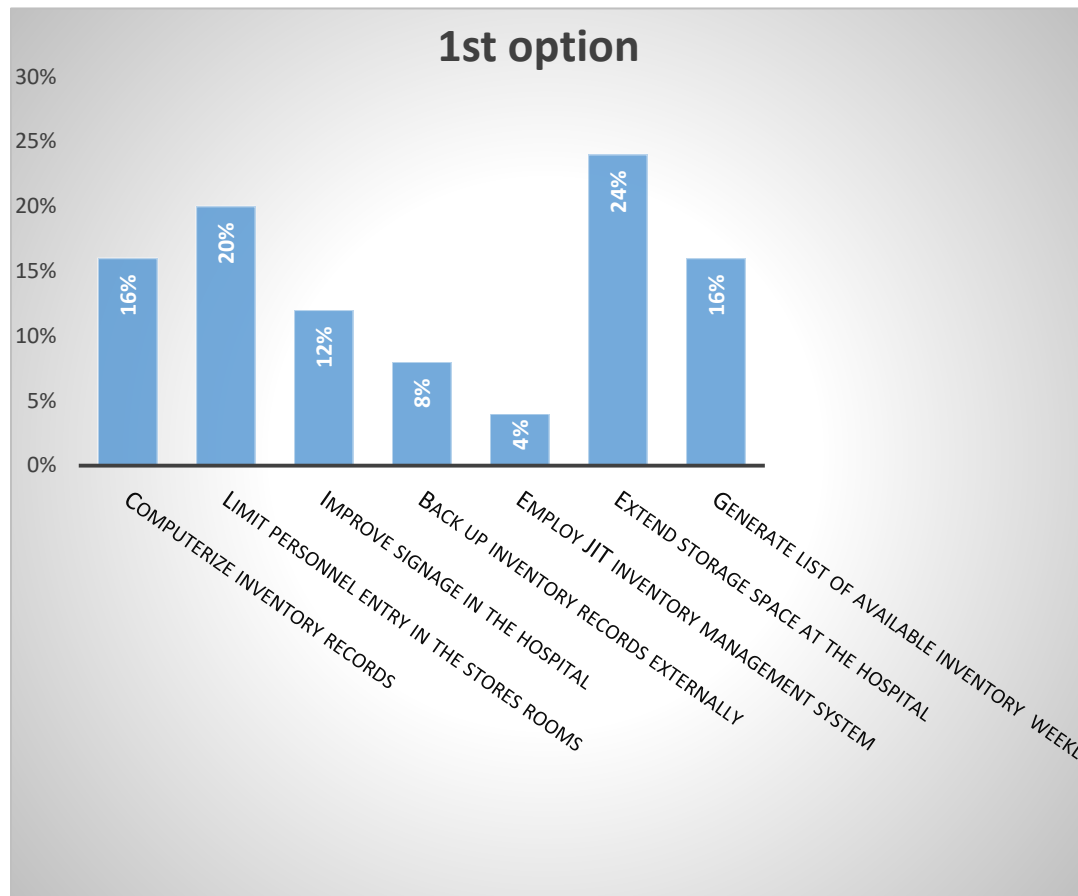
Figure 5 Possible solutions to the problem

The figure above shows the responses showing the possible solutions to the problems and challenges posed by the manual paper based inventory management at NDH. The main solutions posed were extending storage space at the hospital which was chosen by 24% of the respondents as a first option and limiting the number of personnel that enters stores and has access to records which was suggested by 20% of the respondents.

Computerizing the system, improving the signage at the hospital and generating a weekly report of all available inventory that would be distributed throughout departments were

the next suggested solutions with 16% voting for computerization and weekly reports as a main option and 12 % suggesting improving signage. Backing up inventory records externally was also suggested by 8% of the respondents.

Using the JIT inventory management system was the least supported response to the question and this is because most of the respondents did not actually know what JIT is or do not have knowledge on how it works. Also a percentage of respondents who do know stated that because of the emergency situations in a hospital JIT system can not work for some types of inventory.

4.3 Conclusion

This chapter has highlighted the results from the field research carried out by the primary researcher. The study was successful and responses were gathered using the appropriate data gatherings skills. The results were   simplified and explained in relation to the research questions and with the appropriate literature review carried out in the study. The following   chapter will present the research conclusions and recommendations.

CHAPTER 5 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter deals with the presentation summary of findings and discussion of the problem and study. It also deals with the description of the conclusion that is based on the findings and the recommendation put forward based on the major findings.

5.2. Discussion

This main objective of the research carried out was to investigate the problems of using paper based manual inventory control systems in the stores department at Nyanga District Hospital in Manicaland especially during the years 2021. The study revealed five main problems relating to the use of manual inventory practices in the health sector, particularly at Nyanga District Hospital. The purpose of this research was to enhance the current literature about inventory management problems and challenges of managing inventory with manual operations.

The data was collected from 25 participants through interviews and observations in various areas of the organization. All the participants were over 18 years of age and had some work experience at the hospital. In addition, all participants had direct work

relationships with the stores department and inventory at the hospital. They also consented to partake in the demographics survey and the interview process. All the resources collected in the field were used to perform analysis and come up with a theme answering the research questions and objectives.

5.2.1 Users involved in inventory management   procedures at Nyanga District Hospital

The study answered the first research question. The first objective was to identify the user departments that are involved in inventory management and the paper based inventory management procedures at Nyanga District Hospital. The demographic survey showed the following departments that are involved in inventory management : Administration and procurement, stores, pharmacy, OPD, human resources, accounts, laboratory, rehab and the clinical departments.

5.2.2 The relationship between inventory management and service delivery at Nyanga District Hospital

The second objective was to ascertain the relationship between inventory management and service delivery at Nyanga District Hospital. The interviews showed that all of the respondents know the importance of effective inventory management. 96 % of the respondents answered that they understood how inventory management affects service delivery at the hospital. Without good systems, there are obstacles when attending to patients and clients.

5.2.3 Limitations of the existing inventory system in ordering, receiving, recording and distributing of inventory to the user departments at Nyanga District Hospital

The interviews also gave insight on the presence of inventory management elements and the knowledge of the systems by the staff at Nyanga District hospital. Manual paper based systems and tools are used at the hospital in inventory management and most of the staff members showed that the current system works well for them although there are modifications that need to be made.

Furthermore the study shows information on the major limitations of the existing inventory system in ordering, receiving, recording and distributing inventory to the user departments at Nyanga District Hospital. Problems mentioned included the shortage of the paper stock cards or even the loss of the cards, monopoly of inventory by departments with access to the records and time consumption and wastage in the system.

However it can also be noted that some members of staff at NDH like the system as it is and had no problems with it. This can be attributed to the fact that they are of an older generation and have gotten used to manual systems. Also most of the staff has received very little or no training on how to use computerized systems or even modern systems of inventory management. Management is more informal and there is a "just find a way to do it " mentality so even the systems in place are not followed by the book.

5.3 Conclusions

In conclusion, the research study carried out was very successful and yielded findings that can help improve inventory management systems in the Ministry of Health and Child

Care, in Zimbabwe. It is clear from the research that changing the inventory management system at hospitals like NDH will be an investment and will also take a long time but the staff themselves know the problems and have solutions that they know will improve their work and service delivery.

5.4 Implications

The main objective of this study was to investigate the challenges of using the manual inventory management system at Nyanga District Hospital and to add knowledge to the existing research that has been done on the issue. The research that has been done on computerized inventory systems is major and continues to increase as technology evolves and the world changes. Although technology continues to evolve, there is still a necessity for research on manual inventory issues because in Zimbabwe, most organizations still use manual systems for record keeping and for inventory management.

These findings indicate the need for further training of staff in new inventory management systems. Systems should be changed over time and evaluated continuously so progress will be made instead of being stagnant. The findings from this study can be used to improve the system at Nyanga District Hospital and with proper guidance the recommendations can also be used nationwide at similar health institutions.

5.6 Recommendations

From the study results and findings, there are some possible suggestions recommendations that can be made to combat the challenges at Nyanga District Hospital

➢ There is a need for NDH management to discuss and implement small changes in the inventory management system. This includes properly training the stores personnel on effective stock control practices

➢ Workers other than store officers and administration staff should be prohibited from entering the store's rooms and offices unless they have permission and relevant reasons. This will help to prevent pilferage and discrepancies in store records. In line with signage can be improved to shorten the process of re-ordering and restocking of inventory.

➢ Gradually computerize the inventory system at the hospital. This can be done by training the store's staff on basic computer use. A simple database can be made for inventory at the hospital and a backup can also be created. From this a weekly report can be generated weekly and circulated in departments, showing the available inventory and re-order details.

➢ Further research can be carried out even at a local level to improve the system at Nyanga District Hospital and terminate the problems discussed in the research paper.

5.7 Suggestions for Further Research

Further research should be done in the areas of;

➢ The role of record management towards proper inventory management

➢ The importance of inventory control systems on the performance of Organizations

➢ Computerization of inventory control systems at hospitals in Zimbabwe

➢ The challenges of computerization of inventory control systems

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APPENDICES

Appendix i Work Plan

Task ID	Task Name	% Completed
1	Research proposal	100%
1a	Request for permission	100%
1b	Submission to AUREC	100%
1c	Data collection	100%
1d	Data analysis	100%
1e	Findings and recommendations	100%

Appendix ii Budget

Transport and logistics	$10.00
Data collection tools and stationery	$5.00
Communication	$5.00
Total	**$20.00**

Appendix iii Interview Questions

Questions to be asked during the interviews "**Paper based inventory management at Nyanga District Hospital"**

My name is Ashleigh Mawire. I am studying towards an undergraduate degree in Health services management and I am conducting research **"The challenges of using a paper based inventory control system: A case study of Nyanga District Hospital 2021."** May you please kindly assist by answering these questions. This is purely academic research. Therefore, the responses will only be used for academic purposes and will not be revealed to any third party. The collected data will be strictly confidential. Respondents will not be disclosed.

Instructions: Please answer all questions that are relevant to you

Section A: Demographic Details and General Information

1.   What is your gender

1.	Female		2.	Male	

2. Age by the time you get to next birthday

1.	Below 20		2.	20-30		3.	31-40	
4.	41-50		5.	51-60		6.	60+	

3. What is your highest level of education?

1.	Primary education		2.	O-Level		3.	A-Level	
4.	Certificate		5.	Diploma		6.	Degree	
7.	Masters		8.	Doctorate		9	Other (specify)	

4. In which department do you work?

1.	Stores		2.	Outpatients		3.	Wards	
4.	Accounts		5.	Theatre		6.	Pharmacy	
7.	Laboratory		8.	Administration		9.	Human Resources	
10.	Transport		11.	Other specify				

5. For how many years have you worked in this position

1.	Less than 1 year		2.	1 -5 years		3.	5-10 years	
4.	10-15 years		5.	15-20 years		6.	20+ years	

Section B: Operational efficiency in the hospital

6. Losses and wastage that are affecting hospitals can be reduced by effective internal control systems and measures and efficient inventory management systems?

1.	Strongly agree		2.	Agree		3.	Do not agree	

Section C: Hospital inventory control systems and measures

7. To what extent is the Paper stock card and manual inventory control system that is used in the Stores department at Nyanga District Hospital effective and

unproblematic ? : manual request of inventory items; recording of inventory on

paper stock cards; recording of received inventory in the receiving book

1.	Very effective		2.	Effective		3.	Weak		4.	Very weak	

8. Indicate your department and indicate if you are using the systems that correspond to your
department.

Department	System being used		Yes= 1	No =0
Stores	Barcode system	i		
	CCTV	ii		
	Computerized stock records(Database software)	iii		
	BIN/Stock Cards/Stores Requisition	iv		
	Backup copy of master inventory book	v		
	Paper stock cards	vi		
Pharmacy	Stock Card System	vii		
	Medicines Management Information System (MIS)	viii		
Fuel	Coupon System	ix		
	Use of drums for fuel storage	x		
	Refueling from filling stations	xi		
	Computerized fuel management system	xii		
Other departments	Paper records	xiii		
	Computerized records	xiv		

9. Paper stock cards can always be located in the store room at the hospital?

1.	Strongly agree		2.	Agree		3.	Disagree		4.	Strongly disagree	

10. Inventory control systems improve the effectiveness and efficiency of a hospital ?

1.	Strongly agree		2.	Agree		3.	Do not agree	

11. How often is stock out frequency in the organization?

□ Rarely □ Less Frequently □ Frequently Very frequently □ Most frequently

12. Frequency of inventory record update

□ Daily □ Monthly □ Weekly □ Immediately □ Others, Please specify_____

13.Have you experienced discrepancies between stock balances on paper and physical stock balances? □ Yes □

14. If your answer is yes ,then what are the possible causes of discrepancies_____

15. To what extent do you agree that recording stock records on paper affects inventory control

□ Strongly disagree □ Somewhat disagree □ Neither agree nor disagree □ Somewhat Agree □ Strongly agree

16. Paper stock cards are time consuming to fill out and slow down activities at the hospital ?

□ Yes □ No

17. List some of the gaps, loopholes, and weak inventory control systems and measures which make it easy for some employees to steal from the hospital, commit fraud, and abuse hospital assets.

…………………………………………………………………………………………

………………………………………………………………………………………

17b. What do you think are the problems of using the paper based stock records?

……………………………………………………………………………………………

………………………………………………………………………………………

Section D: What can be done?

18. Do you think this hospital has enough inventory control systems to stop wastage, theft, fraud, and abuse of hospital assets and inventory?

1.	Yes		2.	No		3.	Not sure	

19. What solutions do you think can be implemented to make the inventory management system more efficient at all stages?

ii	Limit personnel entry in the stores rooms	
iii	Improve signage in the hospital	
iv	Use an external drive to back up inventory records	
v	Employ JIT inventory management system	

vi	Extend storage space at the hospital	
vii	Generating a list of all available inventory at the hospital every week	
	State any other :	

Appendix iv Consent Form

Study Title: Investigation of challenges of paper based inventory management at Nyanga District Hospital

PI: Ashleigh S.P Mawire

Date:

My name is Ashleigh Mawire, a final year (Health services management) student from Africa university. I am carrying out a study on **challenges of paper based inventory management at Nyanga District Hospital.** I am kindly asking you to participate in this study by answering some questions.

The purpose of the study is to investigate the challenges of the current inventory management system used across the country in state hospitals and come up with solutions and a better system. You were selected as a possible participant because you are an employee of Nyanga District Hospital.

If you decide to participate you will need to answer some questions about the paper stock cards you use. It is expected that this will take a few minutes of your time only. We will ask you about 19 questions related to the inventory management process.

Your participation is voluntary. If you choose to participate, you are free to withdraw your consent and to discontinue participation without penalty. There are no anticipated risks or benefits to your participation. Also there will be no monetary benefits of taking part in this study nor will there be any financial incentives. You may decide to discuss your participation with your family or friends.

Names and any other identification will not be asked for in the questionnaires. This is purely academic research and personal details will not be disclosed to third parties.

If you have decided to participate in this study please sign this form in the space provided below as an indication that you have read and understood the information provided above and have agreed to participate.

---   -------------------------------

Name of Research Participant   Date

Signature of Research Participant or legally authorized representative

If you have any questions concerning this study or consent form beyond those answered by the researcher including questions about the research, your rights as a research participant, or if you feel that you have been treated unfairly and would like to talk to someone other than the researcher, please feel free to contact the Africa University Research Ethics Committee on telephone (020) 60075 or 60026 extension 1156 email aurec@africau.edu

Name of Researcher --

Appendix v Seeking Approval Letter from research site

Ministry of Health and Child Welfare

District Health Executive

Nyanga District Hospital

Bag 2003

Nyanga, Zimbabwe

Dear ma'am

My name is Ashleigh S.P Mawire , and I am a Health services management student at Africa university in Mutare. The research I wish to conduct for my Undergraduate research study involves the exploration and investigation of challenges of using a paper based inventory management system. This project will be conducted under the supervision of Dr. E. Mugomeri (Africa university).

I am hereby kindly seeking your permission in the form of a letter to approach a number of staff at Nyanga District Hospital to ask them questions regarding the stores department and inventory management system.

 Yours sincerely

Ashleigh Mawire

Appendix vi Site approval letter

Ministry of Health and Child Welfare
District Health Executive
Nyanga District Hospital
Bag 2003
Nyanga, Zimbabwe
+263 329 2098 532
+263 775 00 663
dmonyanga@gmail.com

02 February 2022

Africa University

P.O BOX 1320

Mutare

Zimbabwe

Att: Ashleigh S.P Mawire

REF: PERMISSION TO CARRY OUT ACADEMIC RESEARCH

I refer to your request for the above mentioned subject matter and hereby allow you to carry out your academic research on the **CHALLENGES OF USING A PAPER BASED INVENTORY MANAGEMENT SYSTEM AT NYANGA DISTRICT HOSPITAL**.

Please note that the ethical principles that are relevant when conducting any research should be observed.

Regards

Mrs C.Betera

NYANGA DISTRICT HOSPITAL
D.H.S.A.
0 2 JAN 2022
P. BAG 2003, NYANGA
ZIMBABWE TEL: 0298-532/317

District Health Services Administrator

Appendix vii AUREC approval letter

AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE (AUREC)

P.O. Box 1320 Mutare, Zimbabwe, Off Nyanga Road, Old Mutare-Tel (+263-20) 60075/60026/61611 Fax: (+263 20) 61785 website: www.africau.edu

Ref: AU2384/22   23 February, 2022

ASHLEIGH SITHULISIWE PETRONELLA MAWIRE
C/O CHANS
Africa University
Box 1320
MUTARE

RE: **AN INVESTIGATION INTO THE CHALLENGES OF USING PAPER BASED INVENTORY MANAGEMENT SYSTEM AT NYANGA DISTRICT HOSPITAL, MANICALAND IN 2021**

Thank you for the above titled proposal that you submitted to the Africa University Research Ethics Committee for review. Please be advised that AUREC has reviewed and approved your application to conduct the above research.

The approval is based on the following.
a) Research proposal
b) Data collection instruments
c) Informed consent guide
- **APPROVAL NUMBER**   AUREC 2384/22
  This number should be used on all correspondences, consent forms, and appropriate documents.
- **AUREC MEETING DATE**   NA
- **APPROVAL DATE**   February 23, 2022
- **EXPIRATION DATE**   February 23, 2023
- **TYPE OF MEETING**   Expedited
  After the expiration date this research may only continue upon renewal. For purposes of renewal, a progress report on a standard AUREC form should be submitted a month before expiration date.
- **SERIOUS ADVERSE EVENTS** All serious problems having to do with subject safety must be reported to AUREC within 3 working days on standard AUREC form.
- **MODIFICATIONS** Prior AUREC approval is required before implementing any changes in the proposal (including changes in the consent documents)
- **TERMINATION OF STUDY** Upon termination of the study a report has to be submitted to AUREC.

AFRICA UNIVERSITY
RESEARCH ETHICS COMMITTEE (AUREC)

APPROVED
P.O. BOX 1320, MUTARE, ZIMBABWE

Yours Faithfully

MARY CHINZOU –
ASSISTANT RESEARCH OFFICER: FOR CHAIRPERSON
AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE