FACTORS INFLUENCING PHARMACEUTICAL SUPPLY CHAIN MANAGEMENT CYCLE AT KENYA RED CROSS SOCIETY

JACOB MANG'ONDI NYARWATI (BSc.MLT)

A THESIS SUBMITTED IN PARTIAL FULLFILLMENT FOR THE CONFERMENT OF THE DEGREE OF MASTER OF SCIENCE IN HEALTH SYSTEMS MANAGEMENT OF KENYA METHODIST UNIVERSITY

October, 2020

DECLARATION

"This thesis is my original work and has not been presented for a Degree in any university"

Signature.....  .....Date.....6/7/2020.....

Jacob Mang'ondi Nyarwati

HSM-3-1727-1/2012

"This thesis has been submitted for examination with our approval as university supervisors."

Signature..... Date.....

Dr. Wanja Mwaura-Tenambergen

Department of Health System Management

Kenya Methodist University

Signature …… Date.....

Mr. Musa Oluoch

Department of Health System Management

Kenya Methodist University

COPYRIGHT

DEDICATION

I dedicate this thesis to my wife Faith Mwende and my daughter Elsie Osebe for their support and understanding.

ACKNOWLEDGEMENT

My appreciation goes to the administrative and academic staff of Kenya Methodist University for giving me a chance to pursue this course. First am Indebted to my Supervisors Dr. Wanja Mwaura-Tenambergen and Mr. Musa Oluoch for their constant guidance and correction during the process of writing this work. Secondly, I thank the Deputy Secretary General Corporate Services, Susan Ng'ong'a for allowing me to conduct the study in Kenya Red Cross Society. Lastly the staff of Kenya Red Cross procurement department and E-plus.

ABSTRACT

Products and services requisition, Procurement, warehouse management and rational medicine use are all part of pharmaceutical supply chain management cycle. They are critical at all levels of health care organizations and facilities. Pharmaceutical supply chain management cycle is influenced by various factors which determine whether it's efficient or not. These factors include but not limited to human resources, standard operating procedures, organizational culture and procurement planning. This study observes that failure to consider these factors may lead to procurement of sub-standard products and an inefficient pharmaceutical supply chain cycle. The specific objectives of this study are to determine the influence of human resources factor on pharmaceutical supply chain management cycle, examine the influence of standard operating procedures on pharmaceutical supply chain management cycle, establish how organizational culture influence pharmaceutical procurement supply chain management cycle and establish how procurement planning influence pharmaceutical procurement supply chain cycle. The study adopted a descriptive survey design. Data was collected using a questionnaire with semi-structures questions. Collected data was analyzed using descriptive and inferential statistics. Descriptive statistics involved the use of frequencies, percentages and cross tabulations. Inferential statistics involved the use of chi-square test of significance and logistic regression. The chi square test was used to evaluate whether the observed frequencies in the data collected differed significantly from an expected frequency, while logistics regression was used in multivariate analysis to determine the most significant independent variable. The results of the analysis indicated that human resource, organizational culture, standard operating procedures and procurement planning factors influence the efficiency of pharmaceutical supply chain management cycle. The findings of the study also revealed that staffs are aware of KRCS policies and SOPs and that they have the required skills and capacity. The study concludes that the employees at KRCS always use the KRCS policies in the management of pharmaceutical supply chain management. Based on the findings of this study, it is recommended that , there should be periodic training of all staff engaged in procurement of pharmaceutical products, management should ensure that there are clear and documented standard operating procedures on procurement of pharmaceutical products, should adopt progressive organization structure with clear documentation on standard operating procedures and should maintain clear procurement plans. Finally, similar studies should be undertaken in other non-governmental organizations.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

ICT	Information and Communication Technology
INN	International Nonproprietary Name
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KRCS	Kenya Red Cross Society
MSH	Management Sciences for Health
PPDA	Public Procurement and Disposal Act
PPOA	Public Procurement Oversight Authority
PPRA	Public Procurement Regulatory Authority
SCM	Supply Chain Management
SOPs	Standard Operating Procedures
UHC	Universal Health Coverage
VEN	Vital, Essential and Non-essential
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The Pharmaceutical Supply Chain Management cycle is important in ensuring the uninterrupted supply of medicines and other health products to last mile of health. The process includes products requisition, procurement, storage, distribution to the field and monitoring proper use medicine. For the processes to take place smoothly procurement and supply chain information, and quality assurance are key in each step of the cycle. Management Sciences for Health (MSH, 2012) report on quantification agrees with the above statement and adds that the effectiveness and efficiency of the processes helps to avail the right drugs to the right patient at an affordable and competitive price in the right time.

The cycle is also important to humanitarian relief organizations like Kenya Red Cross Society [KRCS] that deal with emergency response issues such as accidents, disasters and other manmade and natural catastrophes that require supply of drugs to respond to the injured. Berger & Garyfalakis (2013) study proposes that flexible but efficient supply chains systems and processes can unlock the need for timely delivery of commodities during disasters, accidents and catastrophes. Bozkurt et al., (2012) study indicates that both natural and man-made catastrophes can cause injuries, deaths, lack of enough food, clean water, medicine, havoc to the road networks and properties as well as destroying employment opportunities and livelihoods of the people. To prevent these impacts, Nikbakhsh and Zanjirani (2011) study suggests that humanitarian organizations should put in place counter contingency measures by creating strong supply chain systems, infrastructure and emergency planning relief operations in advance.

An efficient pharmaceutical supply chain management cycle has elements that work together to ensure that both public and private health care systems can acquire the required products at

the most competitive prices from the correct source in the required quantity and quality in a timely manner. In the same way an efficient and effective procurement policy will also facilitate actors outside the public health care system to acquire and/or import materials that are compliant and consistent with national health care standards of quality. For all this to occur we require a strong, efficient and effective distribution system for medicines to be properly stored, managed, and transported to the last mile of health. Hence, procurement of medicines is a complex process as defined in Sylvia and Willy (2015) study that it encompasses human resource engagement, application of technology, application of SOPs and policies in place, putting the management structure in place, and defining responsibilities of staff. All these processes are put in place to address specific needs of the organization. The process of medicines procurement management carries out market survey, puts in place a database of suppliers, monitors pipeline, alerts on under stocks and overstocks and manages redundant or obsolete stock.

A study by Evelyne and David (2014) looks at the impact of procurement processes on the distribution of drugs in public hospitals in Kenya, the outcome of the study can also apply to different levels in private hospitals and humanitarian organizations hospitals. The study identifies lack of commitment, lack of leadership, poor co-ordination, unfair competition, rampant corruption and insufficient staff or unqualified staff, poor distribution system and failure to utilize the available SOPs and policies as main challenges in public health care procurement system.

According to World Bank (2014) and World Health Organization [WHO] (, 2010) study in conjunction with the Ministry of Medical Services-Kenya, it states that adequate financing for the procurement of pharmaceuticals is identified as the main important part of medicines procurement. It also clearly states that Pharmacists (staff) involved directly or indirectly in procurement of medicines, must have required knowledge about pharmaceuticals as well as

knowledge of the parties involved who can possibly impact the processes and Standard operating procedures [SOPs] or those who may have legal responsibility.

Conflict of interest is illegal in all these processes. Confidentiality, integrity and fairness are important ingredients of procurement in order to create trust among the users, hence increasing the levels of transparency and accountability and reducing the probability of corruption in the procurement exercise. Capacity building, training, workshops and seminars are key areas of emphasis. These statements are supported by Larroya (2011) study, which concludes that existing policies and regulations often can influences the way processes are carried out. This thesis looked at/assessed the factors influencing pharmaceutical procurement in Kenya Red Cross Society.

1.2 Statement of the Problem

Due to the uncertain nature of both natural and manmade disasters and catastrophes, humanitarian relief pharmaceutical supply chain faces this as one of the biggest hurdle to overcome and assessment of the needs. All these come along with time pressure to deliver during emergencies. Mwanjumwa and Theuri (2015) study adds by saying that humanitarian logistics processes are complex and this may lead to procurement department being costly during response to disasters emergencies where it is approximated by the study that about 80% of total expenditures are incurred here.

Kenya Red Cross is one of the largest Humanitarian Relief Organization in Kenya given mandate by the Kenya government to respond to disaster emergencies when they happen. Being a humanitarian organization, it will be important to examine pharmaceutical supply chain cycle.

Documented concerns available indicate that sometimes employees involved in this process either have little or no knowledge, training and experience on the pharmaceutical products and some do have the required knowledge, experience and training on policies and SOPs used in procurement of drugs.

Another factor that can also lead to procurement of substandard products/medicines is lack of or failure to use existing Standard Operating Procedures [SOPs]. This study will add more knowledge on factors influencing pharmaceutical supply chain cycle at KRCS, which is also humanitarian relief organization.

1.3 Purpose of the Study

To determine the factors influencing pharmaceutical supply chain management cycle at Kenya Red Cross Society, by examining some of independent variables like human resources, standard Operating Procedures and Organization Culture.

1.4 Objectives of the Study

1.4.1 Overall Objective

To determine the factors influencing pharmaceutical supply chain management cycle at Kenya Red Cross society.

1.4.2 Specific Objectives

i. To determine the influence of human resources factors on pharmaceutical supply chain management cycle at Kenya Red Cross Society

ii. To examine how standard operating procedures, influence pharmaceutical supply chain management cycle at Kenya Red Cross Society.

iii. To establish how organizational culture influence pharmaceutical supply chain management cycle at Kenya Red Cross Society.

iv. To establish how procurement planning influence pharmaceutical supply chain management cycle at Kenya Red Cross Society.

1.5 Research Questions and Hypotheses

1.5.1 Research questions

i. How does Human Resource factor influence pharmaceutical supply chain management cycle at Kenya Red Cross Society?

ii. How do Standard Operating Procedures influence pharmaceutical supply chain management cycle at Kenya Red Cross Society?

iii. To what extent does organizational culture influence pharmaceutical supply chain management cycle at Kenya Red Cross Society?

iv. How does procurement planning influence pharmaceutical supply chain management cycle at Kenya Red Cross Society?

1.5.2 Hypotheses

Null Hypotheses:

i. Human Resource knowledge on procurement does not influence the pharmaceutical supply chain management cycle at the Kenya Red Cross Society.

ii. Organizational culture does not influence the efficiency of pharmaceutical supply chain management cycle at the Kenya Red Cross Society.

iii. Availability of standard operating procedures does not influence the efficiency of pharmaceutical supply chain management cycle at the Kenya Red Cross Society.

iv. Procurement planning does not influence the efficiency of pharmaceutical supply chain management cycle at Kenya Red Cross Society

1.6 Justification of the Study

The pharmaceutical supply chain management cycle has undergone a lot of changes due to evolution of the digital technology, which has seen health management information system improve in the way medical products, vaccines and technologies are delivered. This has contributed to health system strengthening both in the public and private sector. Like any other process, the pharmaceutical supply chain cycle has inputs. The factors that were investigated in this study affected various levels of the pharmaceutical supply chain management cycle from product requisition, acquisition, storage management, product distribution and monitoring for proper use. According to Public Procurement Regulatory Authority [PPRA], (2016) it stipulates that for one to properly and effectively manage the steps, he/she needs to be familiar with the complete procurement cycle.

1.7 Limitations of the Study

The research only assessed and examined one humanitarian organization (KRCS) and the area of study was mainly focusing on pharmaceutical supply chain cycle. Second limitation is that not all factors affecting pharmaceutical supply chain cycle were studied; hence the study can no conclude that these are the only factors. Thirdly is that the information contained in this study was as at the time data was collected, and this might have changed. Finally, the dependent variable (Pharmaceutical supply chain cycle) is a limiting factor in this study.

1.8 Delimitation of the Study

Independent variables are delimitation factors which are human resources, standard Operating Procedures [SPOs] and organizational culture. Target population, size of population and institution of study too were delimitation factors.

1.9 Significance of the Study

It helps to strengthen the medical products, vaccines and technologies building block of the health system and expands skills and knowledge on how an efficient and effective pharmaceutical supply chain management cycle operates and factors affecting it.

1.10 Assumptions of the Study

All the staffs interviewed were from procurement department involved in pharmaceutical procurement. The research encompassed procurement of drugs used in emergency situations and ordinary situations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The researcher reviewed studies and information that are addressing the factors influencing the pharmaceutical supply chain management cycle in both public and private sector. The purpose of this literature is to find out the existing studies this thesis can build new knowledge on. For a strong, effective and efficient health system there is need for an efficient pharmaceutical supply chain management cycle that promotes delivery of essential drugs to the last mile of health in a timely manner, to the right place and the right people in the quantities required. This will study also supports the current drive by the government of Kenya on Universal Health Coverage [UHC], which for it to function well needs an efficient pharmaceutical supply chain management cycle that also enhances accountability, responsiveness, professionalism and transparency among supply chain management staff.

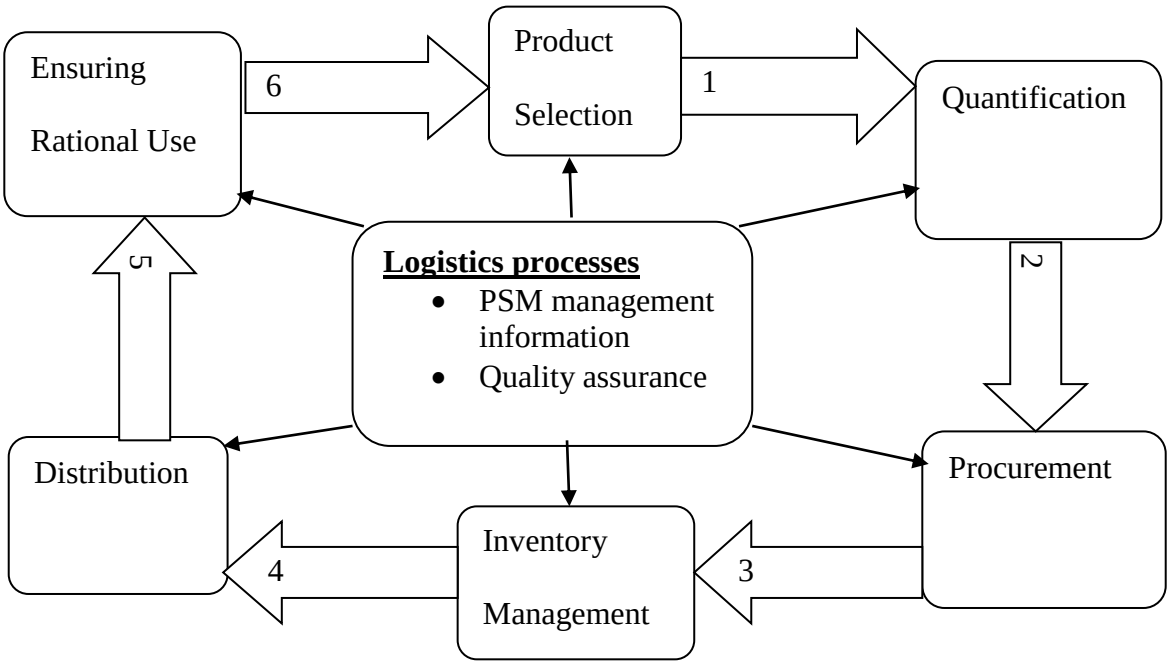
Available information and studies indicate that lack of competitiveness, lack of leadership, transparency and lack of commitment are some of the gaps affecting both public and private sector procurement interventions at different levels. Other challenges identified in various studies are corruption, inflexible bureaucratic nature of the public and private sector which may lead to delays, high costs of purchase and possible manipulation. Same studies also provide solutions on employing experienced staff with prerequisite qualification, who are capable and are able to carry out procurement activities as required.

2.2: Pharmaceutical Supply Chain Management Cycle

This process ensures uninterrupted supply of medicines and other health products. It evolves as follows;

Figure 2.1:

Pharmaceutical Supply Chain Management Cycle



2.2.1 Product Selection

Product selection is the process of identifying which product is required to provide the intended outcome. The selection process identifies which medicines are required to provide the intended healthcare interventions. The importance of selecting controlled number of basic medicines is to influence effective procurement, proper use and affordable pricing. According to MSH (2012) quantification report, basic drugs should be chosen on the basis of their applicability to disease pattern, efficacy and safety, enough scientific data and evidence of its ability to perform in various of settings, quality status, competitive pricing, required pharmacokinetic properties, local manufacturing possibilities, and availability as single

compounds. Identification of the drugs is done using the International Nonproprietary Name [INN], sometimes referred to as the generic name.

2.2.2 Quantification of Medicines

Quantification determines how much of each medicine is required. It involves estimating not only the quantities of medicines needed, but also the amount of money required to purchase the medicines. Some of the other factors to consider when doing quantification of medicines are capacity of human resources, storage space, and service delivery.

There are four methods used in quantification of medicines namely; Consumption, Morbidity, Proxy consumption and Service-level projection of budget requirements methods. Under the *consumption method* records of past consumption of individual medicines are used to project future needs. For *morbidity method* it specifically estimates the need for identified medicines based on the expected number of attendances. It also considers the incidence of common diseases and the standard treatment patterns for the diseases. The *proxy consumption method* is where data on disease incidence, medicine consumption, demand, and pharmaceutical expenditures from a "standard" supply system is used and uses rates to the selected supply system/population. Finally, *Service-level projection of budget requirements method* is where the average medicine cost per attendance or bed-day in different types of hospitals or health facilities is used in a standard system to project the cost medicine in similar types of facilities in the target system. To be noted before is that this method does not estimate quantities of individual medicines (MSH, 2012).

2.2.3 Procurement of Medicines

The major determining factor for availability of medicines and cost is the medicines procurement system. An efficient and effective procurement system is the one that provides availability of the required medicines in the correct quantities at affordable prices, and at

required quality. An organization can acquire medicines through purchase, donation, or local manufacture, and all these must meet the laid down minimum requirements to be accepted for use. Availability of finances and quantification are important steps in the medicines procurement process. According to MSH, (2013) procurement and logistics report, it identifies quantification as one of the core steps of acquiring medicines for public, private and humanitarian health facilities. It further states that procurement of medicines begins with identification and decision on procurement requirements, placement of purchase requisition, request for quotation, review of the quoted bids, contract award, delivery of medicines and payment. For these processes to be effective, proper mechanisms must be in place. Also Fairness, integrity, value for money and transparency are key core values and positive ingredients of medicine procurement. These processes that all medicine procurement follows are known as pharmaceutical supply chain management cycle. The steps above in this cycle must take place for the process to be complete.

2.2.4 Inventory Management

It's defined as the process of maintaining the optimum amount of each medicine in stock. Good inventory management is characterized by accurate and current medicine stock records. Medicine records provide information that is used to analyze needs; hence incorrect records end up producing incorrect needs estimation, which leads to challenges of stock outs and expiry. Records management is also used to monitor performance with indicators and also produces status of inventory and orders, medicine consumption patterns and operating costs.

The importance of medicines inventory management is to make sure that essential medicines are available at all times. Two methods are used for selection of medicines i.e. VEN (vital, essential and non-essential) and ABC. For VEN method medicines are selected based on their value to public health and on the regularity and volume of consumption, while ABC method determines which items on the formulary list must be held in stock (MSH, 2012).

2.2.5 Distribution of medicines

Distribution is the supply of medicines from the storage facilities to where it's required. Distribution can be done through rail, air, road or water transport system. The main purpose is to make sure that pharmaceutical products are available in health facilities when required. The distribution process begins with packaging of medicine, dispatch from warehouse and delivery to the health facility of request. Effective and efficient distribution system depends on the design of the system and good management (MSH, 2013).

2.2.6 Ensuring Rational Use of Medicines

According to MSH (2013) report, proper use of medicines is defined as a situation where patients receive drugs corresponding to their clinical needs, in correct doses for a sufficient period of time and at affordable cost to them. From WHO (2015) report it states that most of the medicines are prescribed, dispensed or sold inappropriately, and that many of the patients fail to take them as required. Unfortunately, overdose, under dose, or misuse of medicines results in wastage of scarce resources and widespread health hazards which is defined as irrational use of medicines. Some of examples of irrational medicine use as indicated in empower school of health notes for post graduate diploma students 2017 class are; excessive use of medicines per patient, antimicrobials used inappropriately, inadequate dosage, over-use of injections when oral formulations are more appropriate, prescription not adhering with clinical guidelines; inappropriate self-medication and non-adherence to dosing regimens. WHO (2015) report advocates for 12 key solutions to promote more rational use of medicines; they include establishment of a multidisciplinary national body to coordinate policies on medicine use, adherence to clinical guidelines, utilization of national essential medicines list, putting in place the drug and therapeutics committees in county and sub-county hospitals, capacity building on pharmacotherapy in undergraduate curricula, maintain the in-service medical education as a licensure requirement, proper supervision, audit and

feedback, Utilization of independent information on medicines, create awareness on education about medicines, prevention of perverse financial incentives, Utilization of appropriate and enforced regulation and ensuring Sufficient government expenditure to allow availability of medicines and staff.

2.3 Human Resources

According to Kenya National bureau of Statistics [KNBS], (2016) findings, Kenyan women trails their men counterparts in formal employment at 65.5%. This study will also try to establish whether this also applies in supply chain management department in Kenya Red cross. The factors to be considered under this dependent variable are as follows:

2.3.1 Staff Awareness

It is defined as ability of staff having knowledge or information about the policies, standard operating procedures, manuals and ethics of an organization in a specific department. This is made possible through induction process of staff and periodic trainings on aspects of organizational ethics, procedures, manuals and policies. Seminega (2012) study states that those involved in the procurement of medicines must make proper use of this information and knowledge of organization ethics in executing their duties and responsibilities.

2.3.2 Staff Knowledge

It is defined as having understanding facts and procedures of organizational procedures and processes. A staff's skill is defined as both knowledge and the particular strategies/formulas used to apply knowledge. Knowledge is enhanced with the person's abilities. Abilities are also defined as the attributes that a person has inherited or acquired through previous experience and applies them into a new task. For an efficient pharmaceutical supply chain management cycle an adequate capacity of appropriate structures with well skilled personnel are key success factors. The quality of staff's skills and ability are important in determining the performance in an organization. Exit of staff from an organization or high turnover may

lead to loss of important competencies which bring about negative consequences on the competitiveness of an organization in its productivity and efficiency. Low turnover in an organization provides preservation and development of competencies that are critical to any organization (Mutua, 2013).

2.3.3 Staff Attitude

It is defined as a settled way of thinking or feeling about something by staff concerning organization ethics, procedures or processes. Staffs engagement on organizational processes and activities is dependent on their attitudes towards a specific task. Attitude of employees may affect the organization either negatively or positively depending on their perception. Therefore, it's important for employees not to appear to engage in, nor give the appearance of engaging in, dishonest or unethical actions during the processes of medicine procurement. (Mehrdad et al., 2013)

2.3.4 Staff Practice

It's defined as the actual application of information or use of an idea, belief, or method, in daily staff performance. Application of appropriate information in medicines procurement ensures an efficient and effective medicines supply chain cycle. Good staff practices and compliance with set guidelines, procedures and policies ensures proper Management in contracting authorities. Proper training and capacity building of staff ensures effective execution of duties due to application of appropriate practice. Monitoring and evaluation of the medicines supply chain cycle is key in determining the best practices that can improve performance (Nkrumah & Mensah, 2013).

2.4 SOPS For Organizational Operations

2.4.1 Availability of Standard Operating Procedures

SOPs are defined as guidelines used by organizations to determine or give a lead on how various processes are carried out by staff. Their availability means that utilization is possible after induction and capacity building. For an efficient and effective medicines Supply chain cycle, SOPs are key in guiding the steps involved to ensure compliance. According to Seminega (2012) study it observes that these manuals and guidelines are provided to most procurement officers in developing countries and indicates too that must be complied to.

2.4.2 Awareness of Standard Operating Procedures

Staffs involved in procurement must know of the content of SOPs for them to be able to adhere to them. For this to be possible, during induction and periodic staff capacity building these trainings must be carried out. SOPS are part of the Internal Control System (ICS) which strengthens the functioning of the pharmaceutical supply chain management cycle system and its omission can compromise the performance of the entire process. Cyrus et al., (2015) study indicates that some of the gaps challenging the health system are proper induction of staff on policies and procedures governing procurement processes.

2.4.3 Content of Standard Operating Procedures

This is the information contained in standard operating procedures. Different departments of an organization have SOPs whose content varies depending on the purpose they are developed to perform. For SOPs to be effective there is need for periodic checks for update and compliance. Periodic checks can look at segregation of duties, inventory management, staff competency, approvals and authorizations and the structure of the organization. This updated information is important in taking appropriate measures. This also relates to Amemba et al., (2013) study which notes that update of the SOPs and policies in the public

sector strengthens the health system and failure to do so can compromise the performance of the entire health system.

2.4.4 Utilization of Standard Operating Procedures

Utilization is defined as application of the SOPs in daily medicines supply chain management cycle. Positive application leads to best practices and negative application leads to bad practices in the processes of medicine procurement. To prevent bad practices in medicines procurement corrective measures needs to be taken by senior management to ensure compliance. This can be done through ensuring that SOPs are in place, induction has been done correctly and periodic update and training. The importance of the SOPs must be emphasized since, the survival and efficacy of the medicines procurement unit and function depends on it. According to Amemba et al., (2013) study observes that a procurement process where SOPs and policies are part of it creates efficiency, accountability and transparency.

2.5 Organization Culture

2.5.1 Management approach to organization Culture

This can be defined as the way senior management influences the behaviour and ethics of staff. Positive behaviour and ethics means compliance to management approach while negative behaviour implies the reverse. According to Acevedo et al., (2010) study observes that in order to achieve results required, effective policy-making plays a key role. It also indicates that whether public or private, management approach can create an atmosphere conducive to ethical or unethical behavior. While both ethical and unethical behaviour is determined by working environment of an organization and senior management, unethical behaviour can also be characterized by lack of clear ethical policies, limited productive resources and lack of intellectual support in an organization. According to Ferrell and Fraedrich (2012) study it argues that the consequences of an act make that action either moral or immoral. Hence an action that leads to beneficial consequences is defined as right or

moral. While one that leads to harmful consequences is defined as wrong or immoral. These definitions are referred to as utilitarianism which is also known as a consequentialist theory. Also, the study indicates that the procurement unit that applies the consequentialist theory stands to gain from ethical standards as it seeks for beneficial consequences in its actions.

2.5.2 Organization Structure to Organization Culture.

This can be defined as the way management structure influences the behaviour and ethics of an organization. According to Acevedo et al., (2010) study it argues that strong organization structure provides the means to compile and integrate valuable procurement information into the policy cycle, thus providing the basis for sound governance and accountable private and public policies. The study also states that insufficient monitoring and evaluation is linked to the absence or the poor presence of a control environment, and the government entities are placed in a difficult situation to implement supply chain management cycle and processes as required by the policy. Hence, non-compliance may take place undetected.

2.5.3 Procurement Documentation

This can be defined as the level of record keeping in an organization. Poor record-keeping can lead to unethical behaviour e.g. fraud and corruption, while proper record keeping ensures efficiency and compliance to supply chain management processes. According to Commission PSC, (2011) report, it observes that failure to involve the procurement departments in strategic decision-making in organizations leads to deployment/ employment of incompetent people to the department.

2.6 Procurement Planning

It is the process of identifying which products or services needs to be procured over a defined period of time. This process can also be referred as procurement work plan. The purpose of procurement work plan is plan for acquisition of products and services in conjunction with

the technical/project team. In order to ensure that procurement department runs successfully, strategic planning is essential. In order to achieve desired results, it's important to engage with the market, end-users and stakeholders (Wogube, 2011).

According to the United Nations [UN], (2012) procurement practitioner's handbook revision, it states that the ultimate goal of procurement planning is establish the goods and services required by a project and schedule them for procurement when required by the project at a competitive cost. It also indicates that timely and proper procurement planning is essential in avoiding last minute or emergency procurement. Therefore, it's clear procurement planning is also important in times of emergencies, and can be made easy if contingency planning is put in place.

2.6.1 Frequency

It is defined as the number of times an activity is undertaken. In medicines procurement planning it refers to the rate at which medicines procurement planning occurs over a particular period of time in project life cycle, which sometimes may depend on prevailing circumstances. As per Pan American Health Organization [PAHO], (2006) practical guide, it identifies ABC analysis as a useful tool to determine frequency of orders and prioritizing purchases. According to Charlene (2016) study, it agrees with frequency definition where it also states that the involved parties can carry out their tasks within defined time based on required time lines and time pressures.

2.6.2 Emergency

Emergency can be defined as a happening taking place when unexpected or unplanned for. It can also be defined as an urgent situation where there is clear evidence of an event which indicates that there is an imminent threat to human live and property. According to Mwanjumwa and Theuri (2015) study, it observes that more studies needs to be carried out in

this area of disaster relief procurement. And for Gelsdorf (2010) study it states that it will be important to amend available procurement SOPs, rules and norms when it comes to emergency relief intervention due to its complicated and increasingly difficult nature.

2.7 Theoretical Framework

This study looks at two relevant theories namely: the principal agent theory and the general systems theory. It presents the interrelationship between the theories and procurement functions in organizations.

2.7.1 Principal-Agent Theory

According to Charlene (2016) study, it's defined as a model where the leader who proposes the contract is called the Principal and the follower who just has to accept or reject the contract is called the Agent. Principal is defined as an individual or party who acts in cohesive manner to recruit an agent to perform tasks for him, while an agent is defined as the person recruited by the principal to accomplish his goals through tasks performed. This theory is relevant in this study since procurement involves two parties too "the buyer" and "the seller" the buyer may be referred in this theory as the principal and the supplier who in this theory is referred as the agent who may accept or reject the contract from the supplier. Thus, this theory can be applied to any condition where there is a principal who defines a contract with an agent who accepts or rejects the contract. At all times the agent will then determine behaviors that are consistent with the desires of the principal's goals.

According to Charlene (2016) it is stated that the agent is required to undertake the contracted activities within a specified period based on required time lines. This theory was also important in finding out whether suppliers carrying out activities on behalf of KRCS obey the specified timelines and all provisions of the contract.

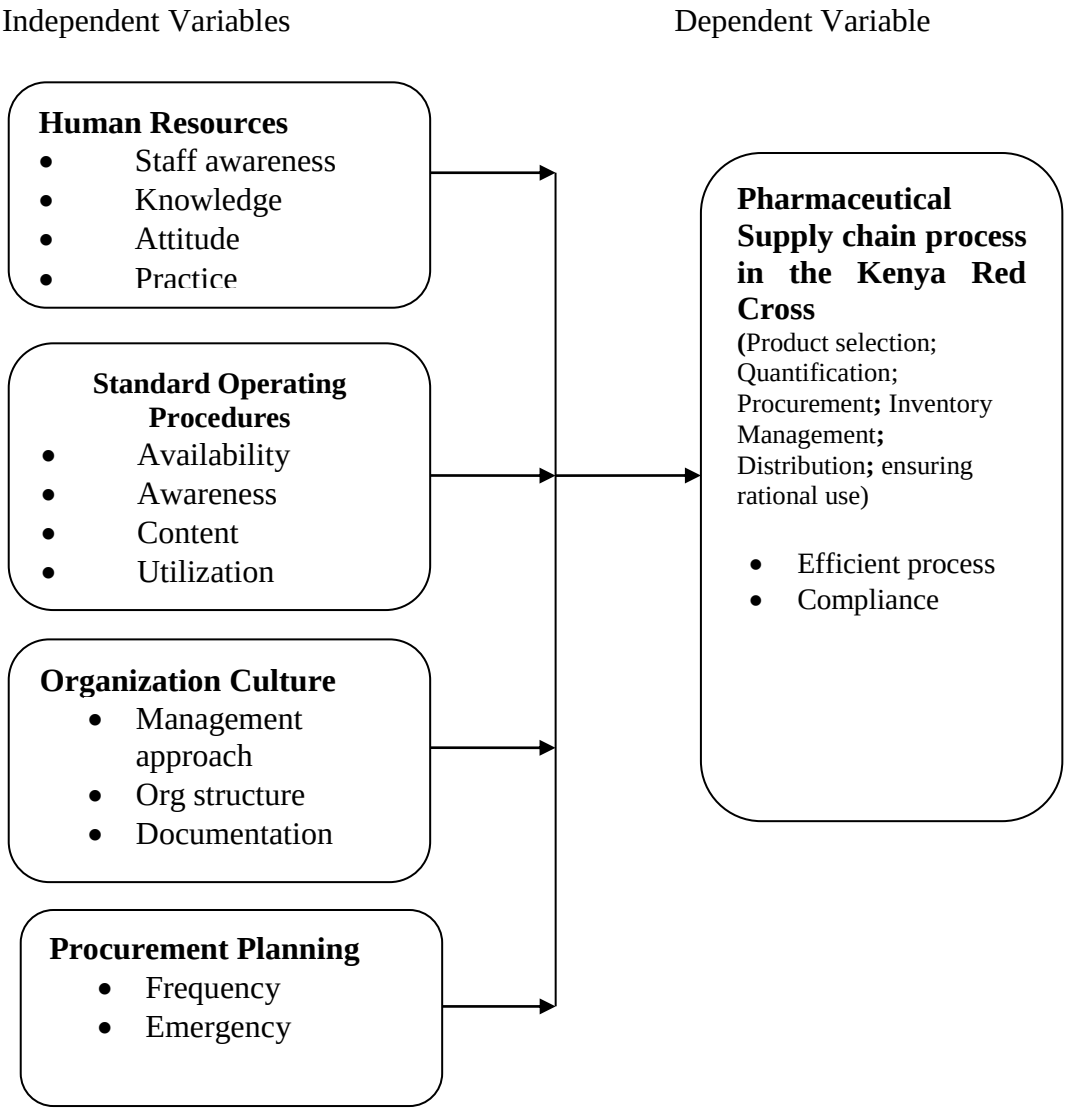
2.7.2 General Systems Theory

According to Thai (2001) on general systems theory, its defined by interaction and inter-dependence of any given system which is a product of practices across both the public and private sector, calculations of policy and political environment, which in turn impacts procurement processes. This theory is crucial in that the contents also affect the pharmaceutical supply chain management cycle, and was applicable in this study as reflected in the results and findings of the study. This theory is also referred to as the open systems model since according to these model elements are open to influences from the outer environment and this can be used to define how independent variables of this study affect the dependent variables in the conceptual framework. This theory also explains that the efficiency of pharmaceutical supply chain management cycle (dependent variable) is considered to be influenced by factors such as human resources, SOPs presence, organization culture, and procurement planning which are independent variables.

2.8 Conceptual Framework

Figure 2.2

***Conceptual Framework*.**



The study hypotheses that insufficient knowledge and awareness of procurement SOPs may lead to non-compliance and insufficient logistics processes in the organization. But, effective organization culture and practices may lead to efficient pharmaceutical supply chain cycle in KRCS.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section presents the research methodology adopted during the implementation of the study. The section starts by examining the research design and the target population. The sampling procedure and data collection instruments are discussed. The chapter ends by presenting the method of data analysis used and the ethical considerations observed when conducting the research.

3.2 Research Design

The study adopted a descriptive survey design to collect information on factors influencing the pharmaceutical supply chain management cycle in Kenya Red Cross Society. Descriptive survey was carried out by collecting data from a selected population. According to Olsen et al., (2010) descriptive survey tries to forecast a social phenomenon specifically problems that are common in the society and that it helps the researcher to establish the relationship among the variables existing at some point.

3.3 Target Population

It is defined as the population to which the study is carried out on. It is supposed to be theoretically countable, observable, existing within a specific time and units. The study was conducted at Kenya Red Cross Society and the target population comprised of procurement, finance and logistics personnel. Currently, there are 48 employees involved in the pharmaceutical procurement department as shown in the table below both at Regional, County and National level, thus they form the study population (Kenya Red Cross Society [KRCS], 2015).

Table 3.1

List of Study Respondents

No.	Position/Title	Total
1	General Manager – Supply Chain management	1
2	Logistics Manager	1
3	Procurement Manager	1
4	Warehouse Manager	1
5	Procurement Officers	4
6	Procurement assistant	8
7	Regional logistics Officers	8
8	Logistics officers	4
9	Logistics assistant	8
10	Finance officers	4
11	Finance assistant	8
	TOTAL	**48**

3.4 Sample Size and sample size determination

The Census sampling method was used to determine sample size due to the small size of target population.

3.5 Data Collection Tool

During data collection Self-administrated questionnaire with open and semi-structured type of questions on a five-point likert scale was used as the main tool. The selection of this tool was guided by the nature of the data collected, the time it was available as well as the objectives of this study. During data collection the study focused on the views, opinion and perception of the service users. All the information collected was through a questionnaire. A structured questionnaire with both open and closed ended questions was used to collect the data on factors influencing pharmaceutical supply chain management cycle in Kenya Red Cross Society.

3.6 Pre-testing

It is defined as preliminary application of the survey questionnaire before actual application to the main target population to check on reliability and validity. Pre-testing was carried out in St. John's ambulances and AAR medical Centre, where the questionnaire was applied to 2 respondents, the collected data was tested for reliability and validity which turned out positive, and this gave a green light to use the questionnaire on main data collection in Kenya Red Cross society. According to Zikmund et al., (2010) study, it defines pre-testing as a screening method that allows the researcher to try the questionnaire on a smaller group of respondents initially to allow for feed-back and corrections. This approach was important because it helped the researcher to minimize on wrong answers due to misinterpretation of questions or blanks in questionnaire due to respondents misunderstanding of questions.

Pre-testing was done in this study to ensure that the questions are relevant, clear and understandable.

3.7 Reliability and Validity

3.7.1 Reliability

According to Mohamad et al., (2014) study, reliability is defined as the consistency of measurement or the extent to which the results are similar over different forms of the same instrument or occasions of data collecting. This test was used to determine the reliability of the questionnaire before administering it for data collection. Cronbach's Alpha was used in the internal consistency reliability test of the questionnaire in order to explain and interpret the reliability among the items contained. In addition, it is preferably method of testing used when there is an existence of multiple five-point Likert scale questions in the survey questionnaire. Cronbach's alpha ranges from 0.0 to 1.0 and which was used to check whether the questionnaire is reliable or not. The study applied 0.7 as the most acceptable and suitable cut-off point for the Cronbach's alpha value since many researchers suggests the same.

3.7.2 Validity

It is defined by Mohamad et al., (2014) study as the level to which scientific information of any given condition match the realities of the world. A measurement instrument can be said to be valid if it measures or represents what it claims to measure or represent. In this study it used to determine the validity of data collection instruments before the commencement of the data collection exercise. During this study the opinions of supervisors was key in setting up questions and testing the adequacy of data collection tool, since using their opinions the researcher was able to adjust the content of the questionnaire.

3.8 Data Analysis and Presentation

According to WHO (2014) Implementation research toolkit, it defines that data analysis and presentation a one that is done through a descriptive analysis of all the main factors while focusing also on the objective. It also indicates that means, standard deviations and frequency may be used in the data analysis. In this study data was collected and checked for completeness, accuracy and consistency. In analyzing data captured in the questionnaire responses SPSS V23. The study also used the chi square test for significance and Logistic regression for the most significant independent variable of the four analyzed. The chi square method was used to evaluate whether the observed frequencies in a distribution differ significantly from an expected frequency according to some assumed hypothesis. While logistic regression method is used when the dependent variable is binary in nature. In this study, the dependent variable was parameterized into efficient and not efficient. Logistic regression generated the coefficients, standard errors and significance levels of a formula to predict a logit transformation of the probability of presence of the characteristic of interest.

The logistic regression is expressed as;

$$f(p) = \frac{1}{1+e^{-p}} \quad \text{.....1}$$

Equation 1 can be simplified as

$$\text{logit}(p) = b_o + b_1X_1 + b_2X_2 + b_3X_3 + \ldots\ldots + b_nX_n \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad 2$$

Where:

p = probability of presence of the characteristic of interest

b_0 = representation of the reference group

b_1 = the regression coefficients associated with the reference group

$X_1 \ldots X_n$ = explanatory variables

3.9 Ethical Considerations

The study considered all ethical issues. To begin with the researcher obtained permission from the Management of Kenya Red Cross Society to collect data in the institution. Ethical approval was obtained from Kenya Methodist University Science, Ethics and Science Committee. Authorization to carry out the research was obtained from NACOSTI. The other ethical considerations were:

Informed consent where the respondents were requested to give informed consent before data collection, after explaining the purpose of the study in a language that they were able to understand. Respondents were assured that participation was voluntary, and that they could withdraw from the study at any stage of the process.

Confidentiality: Respondents were assured of confidentiality of information obtained, anonymity would be maintained and that personal information will not be revealed in the thesis or in any future citations.

Information Dissemination: Information from this study shall be disseminated to only authorized users who KRCS and Kenya Methodist University. Other users must get permission from the researcher and/or the University. Citations for academic forums, seminars, workshops and publication in journals was allowed with acknowledgement of the source document in the references and bibliographies.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

Data was collected on a questionnaire from the KRCS employees. The purpose of this study was to establish factors influencing efficiency of pharmaceutical supply management cycle in Kenya Red Cross Society in both emergency and ordinary conditions, by examining some of the dependent variable against independent variables. Collected data was later analyzed using data analysis methods selected in chapter three.

4.2 Response Rate

The number of questionnaires administered was 48 to various staff of Kenya Red Cross Society. All the questionnaires administered were duly filled and returned, hence recording a response rate of 100%. The returned questionnaires were then later coded into SPSS version 23 and subjected to further analysis.

4.3 Reliability test results

Reliability testing was used to determine the degree to which study questionnaire yielded consistent data even if repeated severally. This was ascertained by computing cronbach's alpha coefficient. The results are presented in Table 4.1.

Table 4.1:

Results of reliability analysis

Variable	Cronbach's Alpha	Number of Items
Human Resources	0.972	21
Standard operating procedure	0.982	17
Organization Culture	0.937	13
Procurement planning	0.938	11

As shown in table 4.1, the alpha coefficient for all items was greater than 0.90. Thus the questionnaire was deemed reliable as a data collection instrument for this study.

4.4 Demographic Characteristics of the Respondents

This was important in order to establish the distribution of the population with regard to gender, age, academic qualifications, experience and designation. Gender was important to determine gender balance, age was key in determining age bracket of majority of employees, academic qualifications to determine relevance of the qualification to the task at hand and finally experience to determine the number of staff with ability to carry out procurement of pharmaceuticals competently due to long experience. This could link demographic information to pharmaceutical supply chain management cycle in Kenya Red Cross. The results of this analysis are presented below in Table 4.2.

Table 4.2:

Demographic characteristics of the Respondents

Variable	Indicator	Frequency (n=48)	Percent (%)
Age	Less than 25 years	4	8.3
	Between 25-35 years	26	54.2
	Above 35 years	18	37.5
Gender	Male	30	62.5
	Female	18	37.5
Highest Level of Education	Tertiary College	6	12.5
	University	31	64.6
	post graduate	11	22.9

The results indicate that 26(54.2%) of the respondents were aged between 25 and 35 years, 18(37.5%) were aged above 35 years while only 4(8.3%) were aged less than 25 years. This implies that majority of the employees are youthful to carry out the activities of the

organization. In terms of gender, the result indicates that majority of the respondents 30(62.5%) in the procurement logistic department and finance department were men. This data agrees with KNBS (2016) findings which indicate that in Kenya women trails men in formal employment at 65.5%.

As far as education is concerned, the result shows that most of the respondents had university level education 31(64.6%), 11(22.9%) had postgraduate training while 6(12.5%) had tertiary college level training. This implies that the employees had the requisite training to carry out the mandates of the organization with regard to procurement issues.

4.5 Pharmaceutical Supply Chain Management Cycle

This is the dependent variable of this study. It was measured using two parameters namely: efficiency of supply chain management cycle and compliance with the laid down procurement policies. If the supply chain cycle is efficient, then it implies that pharmaceutical products will always be availed on time. On the other hand, compliance with set policies means that the pharmaceutical products purchased of good quality. Table 4.3 presents results of the analysis.

Table 4.3:

Pharmaceutical Supply Chain Management Cycle

Variable	Frequency	Percent
SCM Efficiency		
Not efficient	15	31.2
Efficient	33	68.8
SCM Compliance		
Not compliant	15	31.2
Compliant	33	68.8

Table 4.3 presents the responses on the efficiency of the pharmaceutical supply chain management cycle. Majority of the respondents 33 (68.8%) believed that the SCM cycle was

efficient. This implies that, the employees involved in procurement of pharmaceutical products possess the requisite training and skills. It also implies that inventory records are well maintained and regularly updated with a well laid system design and supportive management. This result agrees with MSH (2013) procurement and Logistics report, which observes that good system design and good management influences effective pharmaceutical distribution.

On compliance to standard operating procedures, code of conduct, procurement plans and organizational culture of supply chain management cycle. Majority of the respondents 33 (68.8%) believed that the SCM cycle was compliant. This implies that, the employees involved in procurement of pharmaceutical products follow the laid down procedures and regulations that guide, protect, control and ensure compliance to supply chain management cycle. It also implies that procurement policy of pharmaceutical products is adhered to, procurement plans implemented as laid down, organizational culture preserved through disciplined human resource and risk of fraud reduced.

This result agrees with Public Procurement Regulatory Authority [PPRA], (2016) which states that, it is important to be familiar with the complete procurement cycle and to ensure that there are effective management procedures in place to properly manage each step. This result supports Seminega (2012) report which indicates that majority of procurement officers in various organizations are provided with procurement guidelines and manuals, which he argues must be complied.

4.6 Descriptive analysis of the Study Variables

The dependent variable was efficiency and compliance pharmaceutical supply chain management cycle. The independent variables were: Human resource factors, the standard

operating procedures, organization culture, and procurement planning. The results are presented in the sub-sections that follow.

4.6.1 Human Resource Factors

This variable was included to establish whether the employees of Kenya Red Cross are aware of the pharmaceutical supply chain cycle. Human resource factors were measured using the following variables: awareness, knowledge, attitude and the practice of pharmaceutical supply chain management cycle. For easy computation and interpretation of perception scores on human resource factors influencing pharmaceutical supply chain management cycle at the Kenya Red Cross society, the Likert scaled data was transformed into nominal scale with two categories for each of the indicators.

Based on the responses, human resources awareness of the standard operating procedures was measured using 5 likert scaled items each comprising of 5 perception scores. Consequently, the minimum possible perception score was 5 and maximum possible perception score was 25. Respondents whose Perception score ranged from 5 to 15 were classified as “Not aware of the standard operating procedures”, Those with a perception score of above 15 were deemed to be fully aware of the standard operating procedures. Human resource knowledge on policies relating to supply chain processes had 7 perception items measured using 5 perception scores namely (strongly agree, agree, neutral, disagree and strongly disagree). The minimum possible perception score therefore was 7 and maximum 21 were classified as “Don’t Know HR policies” while those with a perception score greater than 21 were deemed to be fully aware of the HR policies. HR attitude on procurement policies on its part had 5 Likert scaled responses and 5 perception scores. As a result, the minimum possible perception score was 5 and maximum possible perception score was 25. Respondents whose Perception score ranged from 5 to 15 were classified as “With Negative attitude” while those

whose perception score was more than 15 were classified as with positive attitude towards policies on procurement. The last item under human resource policies was HR practices. This was measured using 4 perception items each comprising of 5 Perception scores. As a result, the minimum possible perception score was 4 and maximum possible perception score was 20. Respondents whose Perception score ranged from 5 to 12 perceived that HR practices on procurement of pharmaceutical product are not fully implemented while those with perception scores above 12 believed that HR practices are fully implemented. The results of the analysis are as shown below in table 4.4.

Table 4.4:

Human Resources Factors

Variable	Frequency	Percentage
HR Awareness		
Not aware of SCM cycle	17	35.4
Aware of SCM Cycle	31	64.6
HR knowledge		
Don't Know HR Policies	17	35.4
Know HR Policies	31	64.6
HR attitude		
Negative attitude	15	31.2
Positive attitude	33	68.8
HR Practices		
Procurement Practices not Implemented	14	29.2
Procurement Practices fully implemented	34	70.8

The results indicate that respondents agreed that Kenya Red Cross Society (KRCS) has laid down criteria for hiring the employees involved in the procurement and logistics. 31 (64.6%) of the employees are aware of KRCS policies and the laid down criteria for hiring the employees involved in procurement and logistics of pharmaceutical products. 17(35.4%) were not aware of the policies and laid down criteria for hiring the employees involved in

procurement and logistics of pharmaceutical products. This result implies that KRCS should do more capacity building and awareness to its staff on its policies and employment criteria to increase adherence and effectiveness. This result disagrees with Larroya (2011) study which says that existing policies and regulations may constrain procurement processes, but agrees with Acevedo et al., (2010) study, which states that for organizations to do things right and achieve the results intended effective policy-making with proper information must be in place.

In terms of respondents' knowledge on policies relating to supply chain processes, the study established that most of the respondents 31(64.6%) fully understand KRCS procurement policy that governs the procurement activities, they always confine their activities to the contract terms with suppliers in such a way that the organization benefits without putting it at undue risk, they always refine the contract terms with suppliers in such a way that the organization benefits without putting it at undue risk, and that they are fully aware of the management of a contract including supplier performance However the respondents partially agreed that they are always sensitized on the supply chain processes to increase knowledge on management of pharmaceutical in KRCS, they are always sensitized on KRCS policies on supply chain processes to increase knowledge on management pharmaceutical, and that they frequently have seminars to improve our knowledge on the procurement practices. Only 17(35.4%) of the respondents did not have full knowledge of the policies and procedures governing supply chain processes of pharmaceutical products.

This result agrees with Acevedo et al., (2010) study, which states that for organizations to do things right and achieve the results intended effective policy-making with proper information must be in place.

In terms of employees' attitudes on the procurement policies at KRCS, 33(68.8%) of the respondents had positive attitude towards policies and procedures regarding pharmaceutical supply chain processes. 15(31.2%) of the respondents had negative attitude towards policies and procedures governing the pharmaceutical products supply chain. This implies that KRCS needs to build up capacity and create awareness to all staff so as to reinforce compliance to policies and procedures regarding pharmaceutical supply chain processes. This supports Thai (2001) study which outlines those environmental factors such legal, internal, political and social economic may affect the ethical standards in both public and private procurement.

On practices of the procurement and logistics at KRCS, about 34(71%) of the respondents were of the view that procurement practices are fully implemented at KRCS and all the employees fully understand the procurement practices in KRCS. While only 14(29%) of the respondents felt that pharmaceutical procurement practices are not fully implemented. Implementation of procurement practices ensures that risk to fraud is reduced, and accountability and transparence are upheld, it also improves efficiency and better service delivery. This result disagrees with Larroya (2011) study which observes that existing policies and regulations may constrain procurement processes.

4.6.2 Standard Operating Procedures (SOPs)

This section presents the findings on the respondents knowledge/awareness as well availability of SOPs at KRCS. Standard operating procedures constitute the second independent variable used in this study. This variable had 4 indicators namely: availability of SOPs, Awareness of SOPs, and awareness of SOPs content and utilization of SOPs. The indicators were measured using 5 scaled likert scale. For ease of interpretation on perception scores relating to Standard Operating Procedures, the Likert scaled data was transformed into

nominal scale with two categories for each of the indicators. Availability of SOPs was the first indicator of standard operating procedures. It was measured using 5 likert scaled responses each with 5 rating scores. The 5 items (responses) were consolidated into one response using the compute function in SPSS to compute the variable called "Availability of SOPs" with two nominal categories namely "SOPs are Available and SOPs are available". Since availability of SOPs had 5 items with 5 possible rating outcomes, the minimum possible perception score was 5 and maximum possible perception score was 25. Respondents whose Perception score ranged from 5 to 15 were further classified as "SOPs not available" while those with a perception score above 15 perceived that "SOPs are available". Awareness of standard operating procedures had 4 perception items measured using 5 perception scores namely (strongly agree, agree, neutral, disagree and strongly disagree). The minimum possible perception score therefore was 12 and maximum 20. All respondents whose perception score was less than or equal to 12 were classified as "Not Aware of SOPs" while those with a perception score greater than 12 were classified as "Aware of SOPs". Awareness of SOPs Content also had 4 items and 5 perception scores.

As a result, the minimum possible perception score was 4 and maximum possible perception score was 12. Respondents whose perception score ranged from 4 to 12 were classified as "Not aware of SOPs content" while those whose perception score was more than 12 were classified as "Fully aware of SOPs content". The last indicator of standard operating procedures was Utilization of SOPs. Again, this had 4 Likert scaled responses which after consolidating them using the compute function just like the other indicators yielded to a variable called SOPs utilization. This was measured using 4 perception items each comprising of 5 Perception scores. The minimum possible perception score was 4 and maximum possible perception score was 20. Respondents whose perception score ranged

from 5 to 12 perceived that SOPs are not fully utilized while those with perception rating above 12 perceive that SOPs are fully utilized. The results of the above analysis are presented in Table 4.5.

Table 4.5:

Standard Operating Procedures (SOPs)

Variable	Frequency	Percent
Availability of SOPS		
SOPs NOT available	12	25.0
SOPs are available	36	75.0
Awareness of SOPs		
Not aware of SOPs	17	35.4
Aware of SOPs	31	64.6
Awareness of SOPs Content		
Not aware of SOPs content	13	27.1
Aware of SOPs content	35	72.9
Utilization of SOPS		
SOPs are not utilized	15	31.3
SOPS are utilized	33	68.8

The results in table 4.5 indicate that majority of the respondents 36(75%) agreed that KRCS procurement and logistics SOPs are available. Only 12(25%) felt that KRCS does not have procurement and logistics standard operating procedures. This result agree with Seminega (2012) report that indicates that all Procurement Officers in both private and public sector are provided with procurement guidelines and manuals which the study argues that must be complied.

In regard to awareness of the standard operating procedures, the results indicated that most of the staff 31(65%) are aware of the standard operating procedures relating to procurement and logistics of pharmaceutical products. Only 17(35%) of the respondents indicated that they are

not aware of the pharmaceutical products procurement and logistics standard operating procedures. As indicated in the health sector performance report (2013-2014) failure to use existing Standard Operating Procedures (SOPs) in the procurement of pharmaceutical products and other health related products can lead to procurement of substandard products.

As far as SOPS content is concerned, majority of the respondents 35(73%) were aware of the contents of SOPS. Only 13(27 %) of the respondents indicated that they were not aware of the contents of SOPS. Therefore, there is need for more training and sensitization of SOPS among the procurement staff to ensure that all the laid down procurement and logistics standards are followed. While the number of those who knew the existence of SOPs was 36, those who confirmed they were familiar with the content were 35, thus reducing by 1 person. As stated in Seminega (2012) study, that SOPs strengthen the the functioning of the procurement system and its omission in the procurement system would compromise the performance of the entire function.

The results further indicate that majority of the employees 33(69%) at KRCS fully utilize SOPS. While only 15(31%) of the interviewed respondents felt that SOPS are not fully utilized at KRCS. The number of those who know the content of SOPs is 35 people, but on those who utilize the content is 33persons, thus reducing by 2persons. It's important that all KRCS employees not only know existence and content of SOPs but also utilize the same for better performance in pharmaceutical procurement. This result is well reflected in the health sector performance report (2013-2014) which says that failure to use existing Standard Operating Procedures in the procurement of pharmaceutical products and other health related products can lead to procurement of substandard products.

4.6.3 Organizational Culture

This section addresses the organization culture aspect of the study on the procurement and logistics at KRCS. Organization culture is measured in terms of; management approach,

organization structure and documentation. The indicators were measured using 5 point likert scale. For ease of interpretation on perception scores relating to organizational culture, the Likert scaled data was transformed into nominal scale with two categories for each of the indicators. Perception on management approach in procurement adopted at the KRCs was the first indicator of organizational culture. It was measured using 5 likert scaled responses each with 5 rating scores. Just like with the other variables, the 5 items (responses) were consolidated into one response using the compute function in SPSS to compute the variable called "Perception on Management approach" with two nominal categories namely "Poor management approach" and "good management approach". Since management approach had 5 items with 5 possible rating outcomes, the minimum possible perception score was 5 and maximum possible perception score was 25.

Respondents whose perception score ranged from 5 to 15 were further classified as "Poor management approach" while those with a perception score above 15 perceived that "Management approach is good". Organizational structure had 4 perception items measured using 5 perception scores namely (strongly agree, agree, neutral, disagree and strongly disagree). The minimum possible perception score therefore was 12 and maximum 20. All respondents whose perception score was less than or equal to 12 perceive that KRCS does not have elaborate organizational structure. Rating scale above 12 indicate the presence of an elaborate organizational structure. The last indicator of organizational structure was documentation. Again, this had 4 Likert scaled responses which after consolidating them using the compute function just like the other indicators yielded to a variable called "Perception on documentation". This was measured using 4 perception items each comprising of 5 Perception scores. The minimum possible perception score was 4 and maximum possible perception score was 20. Respondents whose perception score ranged

from 5 to 12 perceived that there is no proper documentation relating to procurement of pharmaceutical products at the KRCs while those with perception rating above 12 perceive that there is proper documentation of procurement procedures at the KRCS. The results of the analysis above are presented in Table 4.6.

Table 4.6:

Organization Culture

Variable	Frequency	Percent
Perception on Management approach		
Poor management approach	21	43.8
Good management approach	27	56.2
Organization Structure		
There is no organization structure	12	25.0
There is organization structure	36	75.0
Documentation		
No documentation	9	18.8
There is documentation	39	81.2

The result in Table 4.6 shows that half of the respondents 27(56. 2%) believe that the management approach adopted at KRCS is good enough to warrant smooth flow in pharmaceutical supply chain cycle. Those who opined that management approach is good cited that the supply chain management department has buy-in from the top management, and that the management involves all stakeholders when making important decisions. Only 21(43.8%) believe that the management approach is poor and need to be improved. Respondents who felt that management approach adopted is poor cited that all decisions made by the management are done without consultation and that everybody in the organization makes decisions as they wish. In this aspect it will be important for KRCS to

have everybody involved in important decision making processes to allow ownership which also increases chances of acceptance, and easy change adoption by employees.

This result agrees with Ferrell and Fraedrich (2012) study that says, working conditions of an organization, leadership skills of top management, availability of required resources and competence of staff determines the ethical level of behavior in procurement staff.

In terms of organization structure, 36(75%) of the respondents stated that, KRCS has clear organization structure with explicit roles and responsibilities. They also stated that the organization has risk management practices which are integrated across all business functions. Only 12(25%) were not aware of existence of well-defined organization structure pertaining to pharmaceutical products supply chain cycle at KRCS. While most of the staff are aware of organizational structure with explicit roles and responsibilities, and risk management structures, it's important the few who are not aware are made aware and regular advocacy for application and utilization can improve performance. This result agrees with Sylvia and Willy (2015) study which states that, procurement is a complex process and encompasses is not simply the act of buying but also encompasses, requisition, market survey, purchasing, distribution and storage which are all influenced by human resource factors and organizational culture.

The result indicates 39(81.2%) respondents strongly agreed to the fact that they always document all the procurement procedures. From the result Only 9(18.8%) of the respondents felt that procurement procedures are not properly documented. High level of acceptance by employees on existence of clear documentation is an indication of available strong systems and utilization of prerequisite documents for Pharmaceutical procurement. Improper record keeping can lead to poor record keeping. This result is supported by South Africa Public

Service Commission report (2011) which indicates that poor record-keeping may lead to unethical behaviour and fraud in the procurement department.

4.6.4 Procurement Planning

This variable was included to ascertain whether there exist plans on procurement and logistic of pharmaceutical products at the Kenya Red Cross Society. Good plans are an integral parts of any successful supply chain. The variable was measured in terms of frequency of procurement planning and on whether there exist emergency plans. The indicators were measured using 5 point Likert scale. To ease on the interpretation of the data on procurement planning, the Likert scaled data was transformed into nominal scale with two categories for each of the indicators. Frequency of planning was the first indicator of procurement planning. It had 5 likert scaled responses each with 5 rating scores. Just like with the other variables, the 5 items (responses) were consolidated into one response using the compute function in SPSS to compute the variable called "Perception on frequency of procurement planning" with two nominal categories namely "frequent" and "Not frequent". Since frequency of planning had 5 items with 5 possible rating outcomes, the minimum possible perception score was 5 and maximum possible perception score was 25. Respondents whose Perception score ranged from 5 to 15 were further classified as "Not efficient" while those with a perception score above 15 perceived that "procurement planning is efficient". Emergency planning had 5 perception items measured using 5 perception scores i.e. (strongly agree, agree, neutral, disagree and strongly disagree). The minimum possible perception score therefore was 5 and maximum 25. All respondents whose perception score was less than or equal to 15 perceived that KRCS does not have elaborate emergency procurement plans in case of disaster. Rating scale above 15 indicate the presence of an elaborate emergency procurement plans. The results of the analysis above are as presented in Table 4.7.

Table 4.7:

Procurement Planning

Variable	Frequency	Percent
Frequency of Procurement Planning		
Not frequent	20	41.7
Frequent	28	58.3
Emergency Planning		
No Emergency plans	13	27.1
There are emergency plans	35	72.9

As analyzed in table 4.7, 28(58.3%) of the respondents believe that the KRCS does procurement planning frequently, while 20(41.7%) indicated that KRCS does not do procurement planning frequently. Procurement planning being key step in purchasing would imply that the right pharmaceutical products are always bought on time. This result agrees with the UN (2012) procurement practitioner's handbook revision 1.1 which indicates that the main goal of procurement planning is to schedule acquisition of goods and services in conjunction with the technical teams at specified times and purpose.

In terms of emergency planning, majority of the respondents 35(72.9%) felt that KRCS has a contingency plan for disasters and emergencies. This implies that they do procurement planning for emergencies and disasters when they happen. It also implies that employees engaged in procurement processes are trained on emergency preparedness as far as procurement of pharmaceutical products is concerned. While only 13(27.1%) of the respondents felt that there are not emergency plans relating to procurement of pharmaceutical products. Emergency planning is important in all organizations working in the area of disaster/emergency preparedness, reduction and response, where KRCS is one of them. This result relates to Gelsdorf (2010) study which indicates that in times of disasters there is need

to amend the standards operating procedures and policies of the tendering processes in order to guide the interventions.

4.7 Hypothesis Testing

To determine the factors influencing pharmaceutical supply chain cycle at the Kenya Red Cross society, the following hypothesis were tested. The dependent variable was pharmaceutical supply chain cycle which was measured using 'The efficiency of the pharmaceutical supply chain management cycle'. Thus, the dependent variable was categorized in terms of efficient and not efficient. This was achieved by consolidating all responses on efficiency of supply chain management cycle and an efficiency test score computed as earlier demonstrated in Table 4.3. The questionnaire had ten items measuring efficiency of supply chain management cycle on a five point likert scale. Efficiency score ranging from 10 to 20 meant that the pharmaceutical supply chain management cycle was efficient. Any score above 20 indicated that the pharmaceutical supply chain management cycle was not efficient. To carry out the tests of hypothesis, chi square test of significance was deemed to be the best method for this study since all the variables were binary in nature. The chi square statistics were obtained by running cross tabulations in SPSS. Results of the test based on the research hypotheses are as follows:

4.7.1 Hypothesis 1

> H_o: Human Resource knowledge on procurement does not influence the pharmaceutical procurement supply chain management cycle at the Kenya Red Cross Society.

To carry out the test, responses on the human resources knowledge on procurement and the efficiency of the procurement management cycle were cross tabulated. Pearson's chi-square results, $\chi^2 = 25.05$, $n = 48$, $p = 0.001$ show that the relationship HR knowledge on

procurement and the efficiency of pharmaceutical supply chain management cycle is significant. Thus, the null hypothesis is rejected at p = 0.05 and conclusion drawn that human resource knowledge on procurement is significantly associated with the efficiency of the pharmaceutical supply chain management cycle.

The quality of human resource is dependent on staff experience and practices, relevant knowledge, staff awareness and attitude related to pharmaceutical procurement. This hypothesis agrees with the WHO (2010) study under the Ministry of Medical Services-Kenya which observes that knowledge of staffs involved in hospital procurement of medicines either directly or indirectly is very important since they have legal responsibility and how they act affects the procurement process.

4.7.2 Hypothesis 2

The study also sought to establish whether the availability of standard operating procedures influence the efficiency of pharmaceutical supply chain management cycle. To achieve this objective, the following hypothesis was formulated.

> H_0: Availability of standard operating procedures does not influence the efficiency of pharmaceutical procurement supply chain management cycle at the Kenya Red Cross Society.

The Pearson's chi-square results, $\chi^2 = 14.255$, n = 48, p = 0.001 show that the relationship between availability of standard operating procedures on procurement and the efficiency of pharmaceutical supply chain management cycle is significant. Thus, the null hypothesis is rejected at p = 0.05 and conclusion is drawn that availability of standard operating procedures on procurement is significantly associated with the efficiency of the pharmaceutical supply chain management cycle.

Standard operating procedures factor is part of internal control system which ensures that activities follow the laid down procedures and regulations to strengthen accountability, transparency and performance of employees. This hypothesis agrees with Seminega (2012) study which states internal control systems strengthens the functioning of the procurement system and that omission of the same can compromise the performance of the entire function unit. The health sector performance report (2013-2014) it is stated that lack of or failure to use existing Standard Operating Procedures (SOPs) procurement in the procurement of medicines and other health related products can lead to procurement of substandard products and thus knowledge of SOPs among the health personnel is crucial for maintenance of quality products.

4.7.3 Hypothesis 3

The study also aimed at establishing whether organizational culture influences the efficiency of pharmaceutical supply chain management cycle. Culture in this study was measured by examining whether the organization has clear documentation procedures. To achieve the purpose of this objective, the following hypothesis was formulated and tested at 5% level of significance.

> H_o: Organizational culture does not influence the efficiency of pharmaceutical procurement supply chain management cycle at the Kenya Red Cross Society.

The Pearson's chi-square results, $\chi^2 = 11.161$, n = 48, p = 0.001 show that the relationship between organization culture and the efficiency of pharmaceutical products supply chain cycle is significant. Thus, the null hypothesis is rejected at p = 0.05 and conclusion is drawn that organization culture is significantly associated with the efficiency of the pharmaceutical supply chain management cycle at the KRCS. Culture of an organization is defined as the environment of the organization that is determined by senior management, systems in place,

practices and quality of human resources. This hypothesis agrees with Ferrell and Fraedrich (2012) study which states that procurement climate majorly is determined by the ethical level of behavior in procurement staff, level of support from top management, level of productive resources and availability of intellectual support in any given organization.

4.7.4 Hypothesis 4

The study also aimed at determining whether procurement planning is significantly associated with the efficiency of pharmaceutical procurement supply chain management cycle at the Kenya Red Cross Society. To achieve this objective, the following hypothesis was formulated and tested at 5% level of significance.

> Ho: Procurement planning does not influence the efficiency of pharmaceutical procurement supply chain management cycle at Kenya Red Cross Society.

The Pearson's chi-square results, $\chi^2 = 23.963$, n = 48, p = 0.001 imply that the relationship between procurement planning and the efficiency of pharmaceutical products supply chain cycle is significant. Thus, the null hypothesis is rejected at p = 0.05 and conclusion drawn that procurement planning is significantly influenced the efficiency of the pharmaceutical supply chain management cycle at the KRCS. According to the UN (2012) procurement practitioner's handbook revision 1.1, it states that the main goal of procurement planning is to schedule acquisition of goods and services at a specific time and a fordable price in conjunction with the technical team. The handbook observes that timely and correct planning is important to avoid last minute or emergency procurement which is against the procurement core values of open, efficient, effective and transparent procurement processes.

4.8 Multivariate analysis

To quantify the results of chi square test, logistic regression analysis was done. Logistic regression model is deemed to be appropriate for this study since the dependent variable is

binary in nature. Logistic regression also facilitated in determining the influence of each independent variable on the dependent variable. The purpose of this analysis was to determine the most closely associated independent variable on depend variable. Results of this analysis are as presented in Tables 4.8, 4.9, 4.10 and 4.11.

Table 4.8:

Omnibus Tests of Model Coefficients

	Chi-square	Df	Sig.
Step	24.789	4	0.010
Block	24.789	4	0.010
Model	24.789	4	0.010

The omnibus test of model coefficients shows the significance of the predictive capacity of the model when independent variables of the study are considered as a block. It is evident in Table 4.8 that the p – value of the model as a block was $p<0.01$ which was less than 0.05. This means that the model has a significant predictive capacity.

Table 4.9:

The Model Summary

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
13.792[a]	0.486	0.760

The results in Table 4.9 indicate that the model predicts 76 % of the variations in efficiency of pharmaceutical supply chain management cycle at the Kenya Red Cross Society. This implies that there is still room for further studies on factors influencing the efficiency of pharmaceutical products supply chain at the Kenya Red Cross society given that there is 24 % of variations in efficiency of pharmaceutical products supply chain management cycle which remain unexplained in this study.

Table 4.10:

Hosmer and Lemeshow Test

Chi-square	Df	Sig.
3.789	8	0.868

Hosmer and Lemeshow Test measures whether the model is fit for prediction with the null hypothesis that the model is fit against the alternate that the model is not fit. Table 4.10 shows the chi-square results, where $\chi^2 = 3.789$, p=0.868. The null hypothesis is not rejected. This means that the model is fit and possesses significant predictive capability. Thus, the model is appropriate for this study.

Table 4.11:

Multivariate logistic regression results

Variables	B	S.E.	P – value	Odds Ratio
Human Resource factors				
Not aware of SOPs(reference)	-	-	-	1.000
Aware of SOPs	0.735	0.359	0.043	2.085
Standard Operating Procedures (SOPS):				
Not available (Reference)	-	-	-	1.000
Available)	0.714	0.321	0.028	2.042
Organizational Culture:				
No documentation(reference)	-	-	-	1.000
Proper documentation	0.080	0.150	0.032	1.083
Procurement Planning				
No Procurement Planning (reference)	-	-	-	1.000
There exist procurement Planning	0.040	0.166	0.048	1.040

The results indicated that Human Resource factors are significantly associated with the efficiency of pharmaceutical products supply chain management cycle at the Kenya Red Cross society. According to the analysis employees who were aware of SOPs were 2.085 times more likely to be efficient compared to those who were not aware of SOPs. The results were significant at 5% level.

The results also indicated that availability of SOPs is significantly associated with the efficiency of pharmaceutical products supply chain management cycle at the Kenya Red Cross society. Employees who had access to SOPs were 2.042 times more likely to be efficient when compared to those who had no access to SOPs. The results were significant at 5% level.

The results further indicate that organization culture significantly affect the efficiency of pharmaceutical supply chain management cycle. The odds of efficiency of pharmaceutical products supply chain management cycle were 1.083 times more with documentation than they were without any documentation. The results were significant t at 5% level.

Lastly, the result indicated that a significant relationship exists between procurement planning and the efficiency of pharmaceutical supply chain management cycle. The odds of pharmaceutical products supply chain management efficiency were 1.04 times more than when there were plans as compared to cases when those plans were nonexistent. The results were significant at 5% level.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATION

5.1 Introduction

This chapter analyzes summary findings and conclusions of the study guided by the main objective which was determine factors influencing pharmaceutical supply management cycle in Kenya Red Cross Society (KRCS).

5.2 Summary of findings

5.2.1 Human Resources

In regard to respondents' awareness of the procurement and logistics policies, the study determined that there is a strong relationship between HR knowledge on procurement and the efficiency of pharmaceutical supply chain management cycle at the KRCS. The study also established that the KRCS has laid down criteria for hiring the employees involved in the procurement and logistics and that the respondents agreed that they were fully aware of the KRCS policies. The respondents strongly agreed that they were always sensitized on KRCS policies on supply chain processes to increase knowledge on management pharmaceutical and they agreed that they do confine their activities to the contract terms with suppliers in such a way that the organization benefits, without putting it at undue risk. They also agreed to the statements that fully understand KRCS procurement policy that governs the procurement activities and fully aware of the management of a contract, including supplier performance. KRCS employees are always supervised in the procurement practices and they agreed that they always follow the procurement policies. They also agreed to the statement that all KRCS employees always follow the procurement practices and KRCS always implement procurement policies well. The study noted that all employees are always supervised to ensure they follow the procurement practices and further agreed that they always follow the

procurement practices in KRCS and that employees fully understand the procurement practices in KRCS.

5.2.2 Standard Operating Procedures (SOPs)

The results determined that there is a significant relationship between the availability of standard operating procedures on procurement and the efficiency of pharmaceutical supply chain management cycle at the KRCS. Majority (75%) of the respondents believed that KRCS procurement and logistics SOPs are available and that qualified pharmaceutical staff are involved in the procurement of medicines. It was also established that the KRCS employs very qualified Pharmaceutical staff. These qualified pharmaceutical staffs are also trained on supply chain processes and they frequently attend seminars to improve their knowledge on the pharmaceutical procurement SOPs. The respondents strongly agreed they knew the content of key procurement and logistics SOPs as well as know the content of pharmaceutical procurement guidelines and essential medicine list. They agreed that the KRCS Supply Chain Management SOPs are regularly updated. They also agreed that the SOPs cover all supply chain management processes in KRCS. The respondents agreed that KRCS employees are always supervised on utilization of SOPs and these SOPs are well utilized in supply chain management processes in KRCS as well as in the in procurement of pharmaceuticals in KRCS.

5.2.3 Organization Culture

The results also indicated that organization culture is significantly associated with the efficiency of pharmaceutical products supply chain cycle at the KRCS. Majority of the respondents (56. 2%) believe that the management approach adopted at KRCS is good enough to warrant smooth flow in pharmaceutical supply chain cycle.

In terms of organization structure, majority of the (75 %) of the respondents stated that, KRCS has clear organization structure with explicit roles and responsibilities. They also stated that the organization has risk management practices which are integrated across all business functions.

Further, the results indicated that there exist clear documentation processes relating to procurement and supply of pharmaceutical products at KRCS. It was determined that (81.2%) respondents strongly agreed that they always document all the procurement procedures. Only (18.8%) of the respondents felt that procurement procedures are not properly documented.

5.2.4 Procurement Planning

The study sought to determine whether there exists any significant relationship between Procurement planning and the efficiency of pharmaceutical supply chain management cycle at the KRCS. The findings of this study indicated that indeed, procurement planning is significantly associated with the efficiency of pharmaceutical supply chain management cycle at the KRCS.

Majority of the respondents (58.3 %) believe that the KRCS does procurement planning frequently. Procurement planning being a key step in purchasing would imply that the right pharmaceutical products are always bought on time.

In terms of emergency planning, majority of the respondents (72.9%) felt that KRCS has a contingency plan for disasters and emergencies. This implies that they do procurement planning for emergencies and disasters when they happen. It also implies that employees engaged in procurement processes are trained on emergency preparedness as far as procurement of pharmaceutical products is concerned. Only (27.1%) of the respondents felt that there are no emergency plans relating to procurement of pharmaceutical products.

5.3 Conclusion

5.3.1 Human Resources

The employees were aware of the procurement and logistics policies at the KRCS and the KRCS has laid down criteria for hiring the employees involved in the procurement and logistics and further the respondents agreed that they were fully aware. Understand KRCS procurement policy that governs the procurement activities and fully aware of the management of a contract, including supplier performance.

All employees are always supervised to ensure they follow the procurement practices and further agreed that they always follow the procurement practices in KRCS and that employees fully understand the procurement practices in KRCS

They were always sensitized on KRCS policies on supply chain processes to increase knowledge on management pharmaceutical and they agreed that they do confine their activities to the contract terms with suppliers in such a way that the organization benefits, without putting it at undue risk

5.3.2 Standard Operating Procedures (SOPs)

In KRCS pharmaceutical supply chain management cycle, SOPs are available and qualified pharmaceutical staffs are involved in the procurement of pharmaceutical products as well as qualified Pharmaceutical staff available in the organization. The respondents strongly agreed they knew the content of key procurement and logistics SOPs as well as know the content of pharmaceutical procurement guidelines and essential medicine lists. The study also noted that the KRCS Supply Chain Management SOPs are regularly updated.

5.3.3 Organization Culture

The study established that there was delegation of authority by the managers to their juniors in the organization and that the Supply chain management department has buy-in from the top management. The study noted that management involved all stakeholders when making

an important decision as well as all decisions made by the management are done with consultation. KRCS has a well-defined organizational structure with explicit roles and responsibilities is in place as well as presence of tender committee is in place at all levels of procurement thresholds

5.3.4 Procurement Planning

The study established that all stakeholders are regularly involved in procurement planning. Further, the procurement planning is important to KRCS during emergencies as they to the statement that they do Procurement planning for emergencies and disasters when they happen. KRCS procurement department follows supply chain management SOPs and procedures during emergencies as well as respondents are trained on emergency preparedness procurement planning.

5.3.5 Supply Chain Management

The employees of KRCS involved in pharmaceutical supply chain management cycle always use the KRCS policies and staffs are fully aware of the KRCS SOPs and policies. The study determined that employees were fully aware of the KRCS procurement practices and have have procurement and logistics training and skills. There was fleet management system or was in place and is being used as well as release of medicines from warehouse/stores is done on First Expiry First Out (FEFO). They were fully understanding KRCS procurement policy that governs the procurement activities and they agreed that they always confine my activities to the contract terms with suppliers in such a way that the organization benefits, without putting it at undue risk. The attested that they frequently have seminars to improve our knowledge on compliance as well as they always refine the contract terms with suppliers in such a way that the organization benefits, without putting it at undue risk.

5.4 Recommendations

They were classified into two categories i.e. policy recommendations and recommendation for further studies.

5.4.1 Policy recommendations

The results of this study revealed that human resources awareness of procurement and logistic policies, availability of standard operating procedures on procurement, organization culture and procurement planning are all significantly associated with the efficiency of pharmaceutical supply chain at the KRCS. The study therefore recommends the following:

i. There should be periodic training of all staff engaged in procurement and logistics of pharmaceutical products.
ii. The management should ensure there are clear and documented standard operating procedures on procurement of pharmaceutical products.
iii. The management should adopt progressive organization structure with clear documentation on standard operating procedures.
iv. The management should maintain clear procurement plans.

5.4.2 Suggestions for further studies

This study focused only on the Kenya Red Cross society. Similar studies should be undertaken in other nongovernmental organizations in Kenya dealing with procurement of pharmaceutical products to determine whether the same factors affect the pharmaceutical supply chain management cycle in those organizations.

REFERENCES

Acevedo, G.L, Rivera, K., Lima, L., & Hwang, H. (2010). *Challenges in monitoring and evaluation: an opportunity to institutionalize M&E systems*. The International Bank for Reconstruction and Development/The World Bank.

Amemba C.S., Getuno P.N., Osoro A & Ng'ang'a M. (2013). *Challenges affecting public procurement performance process in Kenya*. [PhD thesis, Jomo Kenyatta University of Agriculture and Technology]. http://www.rspublication.com/ijrm/ijrm_index.htm

Mehrdad S., Mojtaba S., & Mohammadreza. A. (2012). Business Ethics. *International Journal of Scientific and Research Publications*, 2(1), 1-5 https://www.researchgate.net/publication/228469949_Business_Ethics

Berger K., & Garyfalakis, E. (2013). *Procurement policies in disaster relief - Analysis of sourcing practices applied by humanitarian organizations in the field of disaster response.* http://hj.diva.portal.org/smash/get/diva2:632749/FULLTEXT01.pd

Bozkurt, M., & Duran, S. (2012). Effects of Natural Disaster Trends: A Case Study for Expanding the Pre-Positioning Network of CARE International. *International Journal of Environmental Research and Public Health*. 9 (8), 2863-74. 10.3390/ijerph9082863

Charlene, M.L. R. (2016). An Application of Principal Agent Theory to Contractual Hiring Arrangements within Public Sector Organizations, *Theoretical Economics* 6,28-33. doi: 10.4236/tel.2016.61004.

Cyrus S.A., Pamela G.N., Anthony O., & Ng'ang'a M. (2015). Challenges Affecting Public Procurement Performance Process in Kenya. *European Journal of Business and Management* 7(7), 271-280 https://www.iiste.org/Journals/index.php/EJBM/article/view/20537

Evelyne, A.O. & David, K.M. (2014). *Effects of procurement processes on the distribution of pharmaceutical drugs in public hospitals in Kenya.* MEDShttp://www.primejournal.org /PJSS/pdf /2014/ may/Evelyne and David.pdf.

Gelsdorf, K. (2010). *Global Challenges and their Impact on International Humanitarian Action. Office of Coordination of Humanitarian Affairs [OCHA*] (Occasional Policy Briefing Series – No. 1.) Policy Development and Studies Branch

Ferrell, O. C., & Fraedrich, J. (2012). *Business ethics: Ethical decision making & cases. Connecticut.* Cengage learning.

Kenya National Bureau of Statistics (2016), *Economic survey report.* Kenya National Bureau of Statistics.

Kenya Red Cross Society (2015). *Plans and Budgets Report for Supply Chain Management Department.* Kenya Red Cross Society.

Kioko, J. N., & Were, S. (2014). Factors Affecting Efficiency of the Procurement Function at the Public Institutions in Kenya (A Case of Supplies Branch in Nairobi). *International Journal of Business & Law Research* 2(2), 1-14, https://www.academia.edu/8470394/FACTORS_AFFECTING_EFFICIENCY_OF_THE_PROCUREMENT_FUNCTION_AT_THE_PUBLIC_INSTITUTIONS_IN_KENYA_A_CASE_OF_SUPPLIES_BRANCH_IN_NAIROBI

Larroya, H. C. (2011). *The Importance of Using Purchasing Management to Improve Supply Function. A case study of UNICEF*. http://lup.lub.lu.se/luur/download?func= download File&recordOId=2164162&fileOId=2164184

Management Sciences for Health (2012). *Managing Access to Medicines and Health Technologies, MDS-3, Chapter 23.* https://www.msh.org/our-work/ pharmaceutical-quantifications /procurement-and-logistics.

Management Sciences for Health (2013). *Health Systems for Pharmaceutical Management in Procurement and Logistics processes*. (https://www.msh.org/our-work/health-systems/pharmaceutical-management/procurement-and-logistics).

Ministry of Medical Services-Kenya and World Health Organization (2010). *Kenya Pharmaceutical Country Profile*. (http://www.who.int/medicines/areas /coordination/kenya_pharmaceuticalprofile_december2010.pdf).

Mohamad, M.M., Nor, L., Mohd S K., & Lai Chee Sern. (2014, November 5-6). *Measuring the validity and reliability research instruments* [Conference session]. 4th World Congress on technical and vocational education and training in, Malaysia. https://www.academia.edu/24038324/Measuring_the_Validity_and_Reliability_of_Research_Instruments

Mutua, D. M. (2013). *Factors Affecting Consistency in Supply of Pharmaceutical Products in Government Hospitals in Kenya*. A Case Study of Maragua District Hospital. Developing Country Studies, 3(13),21-52 https://www.iiste.org/Journals/index.php/DCS/article/download/9411/9633

Mwanjumwa, G. & Theuri, S. F. (2015). *Factors Influencing Procurement Performance in Humanitarian Relief Organization a Case of International Committee of the Red Cross in Kenya.* International Journal of Scientific and Research Publications,5(9),1-15 http://www.ijsrp.org/research-paper-1015/ijsrp-p4677.pdf.

Nikbakhsh, E. & Zanjirani F. R. (2011). Humanitarian Logistics Planning in Disaster Relief Operations. In: Z. F.Reza., R. Shabnam., & K, Laleh, (eds.) *Logistics operations and management: Concepts and models.* (pp. 291-332) Elsevier.

Nkrumah, Y., & Mensah, J, (2013). *Improving Governance in Pharmaceutical Procurement and Supply chain management in Kenya, Tanzania and Uganda*. https://silo.tips/download/since-2010-kenya-tanzania-and-uganda-have

Olsen ø., Kaare C., Murray, J. & Ekbom A. (2010). *An Introduction to Epidemiology for Health Professionals. Springer series on Epidemiology and Public Health.Volume 1.* http://www.academia.dk/BiologiskAntropologi/Epidemiologi/PDF/An_Introduction_to_Epidemiology_for_Health_Professionals.pdf.

Pan American Health Organization (2006). *Practical guide for procurement planning and management of strategic public health supplies*. Assessoria Editorial ltd https;//www.paho.org/strategicfund.

Public Procurement Regulatory Authority (2016). *Mandatory Reporting requirements by Procurement entities.* (PPRA circular No. 1/2016); PPRA/P&R/06 Kenya. Public procurement Regulatory Authority.

Public Service Commission (2011). *Report on Profiling and Analysis of the Most Common Manifestations of Corruption and its Related Risks in the public service*. South Africa. http://www.psc.gov.za/documents/2011/PSC%20Report-%20Profiling%20and%20Analysis%20of%20the%20most%20Common%20Manifastations%20of%20Corruption%20and%20its%20Related%20Risks%20in%20the%20Public%20Service.pdf

Seminega, (2012). *Internal Control Systems for Public Procurement in Rwanda: Rwanda Public Procurement Authority* http://www.rppa.gov.rw/fileadmin/files/docs

Sylvia, C.W. & Willy, M. (2015). *Factors affecting performance of procurement function among public technical training institutions in Kisumu County Kenya. Kisumu.* [Masters Thesis, Jomo Kenyatta University of Agriculture and Technology]. http://ijecm.co.uk/wp-content/uploads/2015/05/3520.pdf

Thai, K.V. (2001). Public Procurement Regulatory Authority Reexamined. *Journal for Public Procurement,* 1(1),9-50 http://ippa.org/jopp/download/vol1/Thai.pdf

United Nations (2012). *Procurement Practitioner's Handbook.* https://www.ungm.org /Areas/Public/pph/ch03s01.html .

Wogube, S. G. (2011). *Procurement Planning and Service Delivery in Public enterprise.* [Unpublished Research Report]. Makerere University. http://cees.mak.ac.ug/sites/default/files/publications/Wogube.pdf

World Bank (2014). *The most critical health system challenges currently facing the country Kenya was facing serious account- ability challenges in public*. Bankdocuments. worldbank.org/curated/...../ 918420PUB0Box3014648028740 Oct302014.tx.

World Health organization (2014). *Library Cataloguing-in-Publication Data, Implementation research toolkit. Module 4.* https://www.who.int/tdr/publications/year/2014/9789241506960_workbook_eng.pdf

Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2010*). Business Research Methods* (8th ed.). Cengage Learning.

APPENDICES

Appendix I: Informed Consent Form

Kenya Methodist University
P. 0 Box 267-60200
MERU, Kenya

SUBJECT: INFORMED CONSENT

Dear Respondent,

My name is *Jacob Mang'ondi Nyarwati*. I am a Msc student from Kenya Methodist University. I am conducting a study titled: - *Factors influencing pharmaceutical Supply Chain Management cycle at Kenya Red Cross Society*. The findings will be utilized to strengthen the health systems in Kenya and other Low-in- come countries in Africa. As a result, countries, communities and individuals will benefit from improved quality of healthcare services. This research proposal is critical to strengthening health systems as it will generate new knowledge in this area that will inform decision makers to make decisions that are research based.

Procedure to be followed

Participation in this study will require that I ask you some questions and also access all the hospital's department to address the six pillars of the health system. I will record the information from you in a questionnaire check list.

You have the right to refuse participation in this study. You will not be penalized nor victimized for not joining the study and your decision will not be used against you nor affect you at your place of employment.

Please remember that participation in the study is voluntary. You may ask questions related to the study at any time. You may refuse to respond to any questions and you may stop an interview at any time. You may also stop being in the study at any time without any consequences to the services you are rendering.

Discomforts and risks.

Some of the questions you will be asked are on intimate subject and may be embarrassing or make you uncomfortable. If this happens; you may refuse to answer if you choose. You may also stop the interview at any time. The interview may take about 40 minutes to complete.

Benefits

If you participate in this study you will help us to strengthen the health systems in Kenya and other Low-in- come countries in Africa. As a result, countries, communities and individuals will benefit from improved quality of healthcare services. This field attachment is critical to strengthening the health systems as it will generate new knowledge in this area that will inform decision makers to make decisions that are research based.

Rewards

There is no reward for anyone who chooses to participate in the study.

Confidentiality

The interviews will be conducted in a private setting within the hospital. Your name will not be recorded on the questionnaire and the questionnaires will be kept in a safe place at the University.

Contact Information

If you have any questions you may contact the following supervisors:

1. Mr. Musa Oluoch; musadot123@gmail.com

2. Dr. Wanja Tenambergen; wanjamwaura@gmail.com. Head of Department of Health Systems Management of Kenya Methodist University, Nairobi campus.

Participant's Statement

The above statement regarding my participation in the study is clear to me. I have been given a chance to ask questions and my questions have been answered to my satisfaction. My participation in this study is entirely voluntary. I understand that my records will be kept private and that I can leave the study at any time. I understand that I will not be victimized at my place of work whether I decide to leave the study or not and my decision will not affect the way I am treated at my work place.

Name of Participant……. Date……..

Signature…….

Investigator's Statement

I, the undersigned, have explained to the volunteer in a language s/he understands the procedures to be followed in the study and the risks and the benefits involved.

Name of Interviewer…… Date…….

Interviewer Signature……

Appendix II: Research Questionnaire

FACTORS INFLUENCING PHARMACEUTICAL SUPPLY CHAIN MANAGEMENT CYCLE AT KENYA RED CROSS SOCIETY

SECTION A

SECTION A: SOCIO-DEMOGRAPHICS CHARACTERISTICS

1. **What is you gender?**

   a) Male [ ]
   b) Female [ ]

2. **What is your age in years?**

3. **What is your highest level of education?**

   Secondary ( )
   Tertiary College ( )
   University ( )
   Post Graduate ( )

4. **How long have you been in this organization in years?**

5. **What is your designation in the Organization?**

   General Manager Supply Chain Management [ ]
   Logistics Manager [ ]
   Procurement Manager [ ]
   Warehouse Manager [ ]
   Regional Logistics Officer [ ]
   Logistics Officer [ ]
   Procurement Officer [ ]
   Pharmaceutical officer [ ]
   Logistics Assistant [ ]
   Procurement Assistant [ ]
   Others [ ]

SECTION B: HUMAN RESOURCES

Tick the most appropriate: **SD-** Strongly agree; **A-**Agree; **N-**Neutral; **D-**Disagree; **SD-** Strongly Disagree

No	Items	SD	A	N	D	SD
Awareness						
1.	There are always adequate staff in the logistics department in the organization					
2.	The KRCS has laid down criteria for hiring the employees involved in the procurement and logistics.					
3.	I am fully aware of the KRCS procurement practices					
4.	I am fully aware of the KRCS policies					
5.	We always use the KRCS policies in the management of supply chain management					
Knowledge						
6.	We are always sensitized on the supply chain processes to increase knowledge on management pharmaceutical in KRCS.					
7.	We are always sensitized on KRCS policies on supply chain processes to increase knowledge on management pharmaceutical.					
8.	We frequently have seminars to improve our knowledge on the procurement practices.					
9.	I fully understand KRCS procurement policy that governs the procurement activities					
10.	I always confine my activities to the contract terms with suppliers in such a way that the organization benefits, without putting it at undue risk					
11.	I always refine the contract terms with suppliers in such a way that the organization benefits, without putting it at undue risk					
12.	I am fully aware of the management of a contract, including supplier performance					

Attitude						
13.	KRCS always implement procurement policies well					
14.	All KRCS employees always follow the procurement policies					
15.	All KRCS employees always follow the procurement practices					
16.	We always follow the procurement policies					
17.	KRCS employees are always supervised in the procurement practices					
Practice						
18.	KRCS implements the procurement practices					
19.	All employees fully understand the procurement practices in KRCS.					
20.	We always follow the procurement practices in KRCS.					
21.	All employees are always supervised to ensure they follow the procurement practices					

SECTION C: STANDARD OPERATING PROCEDURES (SOPs)

Tick the most appropriate: **SD-** Strongly agree; **A-**Agree; **N-**Neutral; **D-**Disagree; **SD-** Strongly Disagree

No	**Items**	**SD**	**A**	**N**	**D**	**SD**
Availability						
22.	KRCS procurement and logistics SOPs are available					
23.	Pharmaceutical procurement guidelines and essential medicine list available					
24.	Qualified Pharmaceutical staff available in the organization					
25.	Qualified pharmaceutical staff are involved in the procurement of medicines					
26.	Qualified pharmaceutical staff involved in dispensing of medicines					
Awareness						
27.	I am aware of KRCS procurement and logistics SOPs.					

28.	We have been sensitized on pharmaceutical procurement guidelines and essential medicine list usage.					
29.	We frequently have seminars to improve our knowledge on the pharmaceutical procurement SOPs.					
30.	Qualified pharmaceutical staffs are also trained on supply chain processes.					
Content						
31.	I know the content of key procurement and logistics SOPs					
32.	I know the content of pharmaceutical procurement guidelines and essential medicine list					
33.	SOPs cover all supply chain management processes in KRCS					
34.	KRCS Supply chain Management SOPs are regularly updated					
Utilization						
35.	SOPs are utilized in procurement of pharmaceuticals in KRCS					
36.	SOPs are well utilized in supply chain management processes in KRCS					
37.	There is compliance in utilization of SOPs in KRCS					
38.	KRCS employees are always supervised on utilization of SOPs					

SECTION D: ORGANIZATION CULTURE

Tick the most appropriate: **SD-** Strongly agree; **A-**Agree; **N-**Neutral; **D-**Disagree; **SD-** Strongly Disagree

No	**Items**	**SD**	**A**	**N**	**D**	**SD**
Management Approach						
39.	There is delegation of authority by the managers to their juniors in the organization					
40.	Supply chain management department has buy-in from the top management					

41.	The management involves all stakeholders when making an important decision.					
42.	All decisions made by the management are done without consultation					
43.	Everybody in the organization makes decisions as they wish					
Organization Structure						
44.	Procurement department heads are involved in the management of the organization.					
45.	KRCS has a well defined organizational structure with explicit roles and responsibilities is in place					
46.	The organization has risk management practices integrated across all business functions					
47.	A tender committee is in place at all levels of procurement thresholds					
Documentation						
48.	The organization has proper documentation in procurement and logistics processes.					
49.	Documentation processes follow the laid down standard operating Procedures					
50.	All KRCS employees always follow the documentation processes					
51.	We always document all the procurement procedures					

SECTION E: PROCUREMENT PLANNING

Tick the most appropriate: **SD-** Strongly agree; **A-**Agree; **N-**Neutral; **D-**Disagree; **SD-**Strongly Disagree

No	**Items**	**SD**	**A**	**N**	**D**	**SD**
Frequency						
52.	Procurement planning is always done annually in KRCS					
53.	Procurement planning is done always semi-annually in KRCS					
54.	Procurement planning is always done on a quarterly basis					

	in KRCS					
55.	Procurement planning is always done on a monthly basis					
56.	Procurement plan is regularly updated					
57.	All stakeholders are regularly involved in procurement planning					
Emergency						
58.	KRCS has a contingency plan for disasters and emergencies					
59.	We do Procurement planning for emergencies and disasters when they happen.					
60.	We are trained on emergency preparedness procurement planning					
61.	KRCS procurement department follows supply chain management SOPs and procedures during emergencies.					
62.	Procurement planning is important to KRCS during emergencies					

SECTION F: SUPPLY CHAIN MANAGEMENT

Tick the most appropriate: **SD-** Strongly agree; **A-**Agree; **N-**Neutral; **D-**Disagree; **SD-**Strongly Disagree

No	**Items**	**SD**	**A**	**N**	**D**	**SD**
Efficiency						
63.	There are always adequate staff in the procurement and logistics department in the organization					
64.	I have procurement and logistics training and skills					
65.	Quantification and forecasting of pharmaceuticals are carried out					
66.	Inventory management is maintained and updated					
67.	Release of medicines from warehouse/stores is done on First Expiry First Out (FEFO)					
68.	I am fully aware of the KRCS procurement practices					
69.	A fleet management system is in place and is being used					
70.	Lead times on procurement processes are monitored					

71.	I am fully aware of the KRCS SOPs and policies					
72.	We always use the KRCS policies in the management of supply chain management					
Compliance						
73.	We are always sensitized on the supply chain processes to increase knowledge on compliance.					
74.	We are always sensitized on KRCS policies on supply chain processes to increase knowledge on compliance					
75.	We frequently have seminars to improve our knowledge on compliance.					
76.	I fully understand KRCS procurement policy that governs the procurement activities					
77.	I always confine my activities to the contract terms with suppliers in such a way that the organization benefits, without putting it at undue risk					
78.	I always refine the contract terms with suppliers in such a way that the organization benefits, without putting it at undue risk					
79.	I am fully aware of the management of a contract, including supplier performance					

Appendix III: SERC Clearance Permit

KENYA METHODIST UNIVERSITY
P. O. BOX 267 MERU - 60200, KENYA
TEL: 254-064-30301/31229/30367/31171
FAX: 254-64-30162
EMAIL: INFO@KEMU.AC.KE

12TH OCTOBER, 2017

Jacob Mang'ondi Nyarwati
HSM-3-1727-1/2012

Dear Jacob,

SUBJECT: ETHICAL CLEARANCE OF A MASTERS' RESEARCH THESIS

Your request for ethical clearance for your Masters' Research Thesis titled "Factors Influencing Pharmaceutical Supply Chain Management Cycle at Kenya Red Cross Society" has been granted to you in accordance with the content of your Thesis proposal.

As Principal Investigator, you are responsible for fulfilling the following requirements of approval:

1. All co-investigators must be kept informed of the status of the Thesis.
2. Changes, amendments, and addenda to the protocol or the consent form must be submitted to the SERC for re-review and approval prior to the activation of the changes. The Proposal number assigned to the Thesis should be cited in any correspondence.
3. Adverse events should be reported to the SERC. New information that becomes available which could change the risk: benefit ratio must be submitted promptly for SERC review. The SERC and outside agencies must review the information to determine if the protocol should be modified, discontinued, or continued as originally approved.
4. Only approved consent forms are to be used in the enrollment of participants. All consent forms signed by subjects and/or witnesses should be retained on file. The SERC may conduct audits of all study records, and consent documentation may be part of such audits.

5. SERC regulations require review of an approved study not less than once per 12-month period. **Therefore, a continuing review application must be submitted to the SERC in order to continue the study beyond the approved period.** Failure to submit a continuing review application in a timely fashion will result in termination of the study, at which point new participants may not be enrolled and currently enrolled participants must be taken off the study.

Please note that any substantial changes on the scope of your research will require an approval.

Thank You,

METHODIST UNIVERSITY DEAN 12 OCT 2017 POST GRADUATE STUDIES P.O. BOX 267-60200, MERU

Dr. Wamachi
Chair, SERC

Cc: Dean, RD&PGS

Appendix IV: Kenya Red Cross Society (KRCS) authorization to collect data

Kenya Red Cross

All correspondence to be addressed to:-
The Secretary General
South 'C' (Bellevue)
Red Cross Road, Off Popo Road
P.O. Box 40712, 00100-GPO, Nairobi, Kenya
Tel: (254-20) 6003563/6002465/3950000
Fax: (254 20) 3950444
Mobiles: 0703-037000/0722-206958/0733-333049
Wireless: 020-2356062/3
Email: info@redcross.or.ke
Website: www.redcross.or.ke

29th July 2019

OUR REF: HR/JM/LK/2019

Jacob Mang'ondi Nyarwati
Area Manager-Kakuma
Action Africa Help International
Nairobi

Dear Jacob,

RE: REQUEST FOR PERMISSION TO COLLECT DATA FOR MASTERS THESIS AT KENYA RED CROSS SOCIETY

This is in reference to your email dated 24th June 2019 requesting for permission to collect data for your master's thesis at Kenya Red Cross Society.

We are delighted to inform you that the request has been granted.

We will offer you our support during the data collection period to commence from 5th August 2019 to 26th August 2019.

We wish you a progressive career as you embark on this career advancement and development opportunity and congratulate you for the initiative you have undertaken.

Yours sincerely,

Susan Ng'ong'a
Deputy Secretary General Corporate Services & Supply Chain

Appendix V: NACOSTI authorization to carry out the Research

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: 020 400 7000,
0713 788787,0735404245
Fax: +254-20-318245,318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/18/48655/21115** Date: **20th February, 2018**

Jacob Mangondi Nyarwati
Kenya Methodist University
P.O. Box 267 – 60200
MERU.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Factors influencing pharmaceutical supply chain management cycle at Kenya Red Cross Society"*** I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for the period ending **20th February, 2019.**

You are advised to report to **the County Commissioner, the County Director of Education and the County Director of Health Services, Nairobi County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

GP Kalerwa
GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Nairobi County.

The County Director of Education
Nairobi County.