

**INFLUENCE OF TOTAL QUALITY MANAGEMENT ON PROVISION
OF MEDICAL LABORATORY SERVICES AT JARAMOGI OGINGA
ODINGA TEACHING AND REFERAL HOSPITAL,
KISUMU COUNTY, KENYA.**

BY

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DECLARATION

This Research Project is my original work and has never been presented for the award of any degree in any other University.

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DEDICATION

This Research Project is dedicated to my Family.

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LIST OF ABBREVIATIONS AND ACRONYMS

AIDS:	Acquired Immunodeficiency Syndrome
ART:	Antiretroviral Therapy
ARV:	Antiretroviral
CD4:	Cell Differential Four
CDC:	Centres for Disease Control and Prevention
HIV:	Human Immunodeficiency Virus
ISO:	International Organization for Standardization
KEMRI:	Kenya Medical Research Institute
NASCOP:	Kenya National AIDS and STD Control Programme
JOOTRH:	Jaramogi Oginga Odinga Teaching and Referral Hospital
STI:	Sexually Transmitted Infection
TB:	Tuberculosis
TQM:	Total Quality Management
QA:	Quality Assurance
QMS:	Quality Management System
UN:	United Nations
WHO:	World Health Organization

ABSTRACT

This study sought to find out the influence of Total Quality Management on provision of medical Laboratory services at Jaramogi Oginga Odinga Teaching and Referral Hospital. Medical laboratory Services are essential and necessary services, this is often taken for granted in most health hospital systems in resource-limited settings. Laboratories are important considering the roles they play in the public health sector, in disease control and prevention, and in individual patient diagnosis and care, and yet many people do not have access to reliable, affordable, diagnostic laboratory services. In developed countries, majority of medical decisions are based on medical laboratory tests. However, clinical laboratories in resource limited settings are based on clinical judgment and empiric diseases. Without appropriate, adequate laboratory systems and support to patients, many cases of significant illnesses are likely to be misinterpreted, misdiagnosed and mismanaged hence leading to no optimum treatment. There is therefore a need to strengthen public health laboratories for provision of better services. One of the approaches to achieve this goal is through Total quality management, thus, there is a need to study the influence of Total Quality Management on provision of services at the Jaramogi Oginga Odinga teaching and referral hospital laboratory.

Customer satisfaction monitoring, leadership influence, laboratory staff involvement and continuous improvement were the focus of the study. The target population was 150 staff who were staff either working in the laboratory or derives services from the laboratory, 108 of them were simple randomized to join the study. The research used descriptive survey research design. Questionnaires were used for data collection. Data collected was in a Likert scale of 1 to 5. The study had a response rate of 89.81%, Pilot testing to ascertain instrument was valid done by test retest method, Data was entered and analyzed using a computer supported software. Categorical data for participant characteristics were presented by use of frequencies and percentages. Descriptive statistics was used to display findings. The respondents who agreed that customer satisfaction monitoring influenced provision of services at the laboratory were 61.85%, those who agreed that leadership has influence on provision of services were 64%, those who agreed that staff involvement has influence on services provision were 41.23% and those who agreed that continuous improvement has influence on services provision were 52.57%. The study concluded that there is a positive influence of Total Quality Management at Jaramogi Oginga Odinga Teaching and referral Hospital laboratory, however there are areas that are weak and the study recommends further strengthening.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Medical health Public medical laboratory services are essential component of a country's national health system, as they are important in disease diagnosis, prevention, treatment, and outbreak investigations. Public Health Laboratories operate as a first line of defence to protect the public against diseases and other health hazards. Working in collaboration with other arms of the nation's public health system, public health laboratories provide clinical diagnostic testing, disease surveillance, environmental and radiological testing, emergency response support, applied research, laboratory training and other essential services to the communities they serve (National Public Health Laboratory Services NPHLS Report, 2015).

Public health laboratory scientists are highly educated specialists with knowledge of one or more scientific disciplines, advanced skills in laboratory practice and the ability to apply this expertise to the solution of complex problems affecting human health. A fully-working medical laboratory services is a crucial part of the medical public health care system in the fight against HIV & AIDS, tuberculosis (TB), malaria and many other diseases (Mundy, 2012), In many industrialized countries, a functional laboratory ensures a first-line response to support prevention, treatment, surveillance, and outbreak investigations.

In developed countries, the vast majority of medical decisions are based on medical laboratory tests; in Canada, for example, billions of laboratory tests are performed annually, influencing an estimated 75% of all medical decisions (Naugler et al., 2015). In Europe and central Asia, there was an initiative by World Health Organization (WHO) of strengthening laboratory capacities to support national programs (WHO, 2014), WHO advocates for, and continue to work with, member states to improve laboratory services through this initiative. Thus, building adequate and sustainable laboratory medicine capacity is essential in developing basic health care infrastructure. Clinical laboratory tests market is expected to grow at a considerable rate

throughout the forecast period owing to the fact that laboratory test are an indispensable part of all medical diagnostic technologies and almost all medical diagnosis are dependent on one or more clinical laboratory tests' results.

A global increase in the demand for clinical laboratory tests is a direct consequence of the need of the medical fraternity to gather and process patient related medical information for its use by physicians and healthcare providers to impart accurate preventive measure and treatments (Koh et al., 2014). A wide range of clinical tests which provide the medical practitioner with the ability to detect disease progression includes blood and urine tests ranging from simple to complex, various medical chemistry panels and molecular expression genetic analysis. These tests enable early disease detection and aid practitioners to provide better treatment. Some of the other drivers for the growth of the clinical laboratory tests market are an expanding base of geriatric population, growing incidences of chronic diseases and growing patient awareness towards disease diagnosis. The ability of specialized and accurate diagnosis provided by clinical laboratory tests to medical practitioners especially in the fields of endocrinology, gynaecology and oncology is expected to drive market demand for clinical laboratory tests through to 2020.

The global clinical laboratory tests market is expected to grow at a CAGR of 6.8% during the forecast period, to reach USD 148.8 billion in 2020 (Aubrey, 2015), However, Clinical laboratories in resource limited settings have been neglected and are not optimized to ensure accurate diagnoses (White et al., 2013). The majority of treatment decisions in many resource limited settings are based on clinical judgment and empiric diagnoses. Only a few simple microscopic and kit-based laboratory tests have become widely used at point of care such as HIV and malaria rapid diagnostic tests. The cost of treatment in the paediatric and adult wards was actually lower with accurate laboratory testing and the introduction of electronic support system for ordering laboratory tests and production of results in good time helps in cost reduction (Kilne et al., 2010).

African countries have a significant disease burden, with HIV/AIDS, TB and malaria making up the majority of the disease and death rates (Global Fund, 2010). There is a crucial need for expanding Public laboratory services throughout sub-Saharan Africa. This is critical because of the region's burden of disease. Laboratories in sub-Saharan Africa have been adversely affected

by many factors, including political instability, corruption, unmotivated personnel, and lack of effective management systems, particularly in the governmental public sector. There is a need for increased investment in laboratory services to avoid compromising patient care (Petti, 2006). In East Africa, Kenya also has a higher burden of HIV, TB and Malaria (KAIS, 2012) and (KDHS, 2014) and Kisumu has more than double (14.9%) prevalence of HIV compared to the national prevalence 6.1%, (KAIS, 2012). Jaramogi Oginga Odinga Teaching and Referral Hospital (JOOTRH) is the largest referral hospital in Western and Nyanza province. The Public Medical laboratory is located within the hospital premises and will be the focus of this study.

Several plans from supporting international partners are underway to help strengthen laboratory infrastructure in this region (Global Fund, 2010). It is important to realize the important role that medical laboratories play in fighting HIV & AIDS, TB and malaria and the resulting increase in funding sources so for example, from the Global Fund to Fight AIDS, TB and Malaria, the President's Emergency Plan for AIDS Relief (PEPFAR) and many others, to build laboratory system capacity was the turning point for improving laboratories (Mundy, 2012). Donor-funded laboratory strengthening efforts are often focused first on developing appropriate technologies and providing equipment, supplies and technical training. Management and leadership weaknesses are not sufficient to leverage financial inputs or sustain improved laboratory performance. That state is gradually changing and focus now is on strengthening laboratory systems as part of overall health systems strengthening. A key component of these initiatives is the enforcement of Effective services provision through accreditation by international standards such as the International Organization for Standardization (ISO) 25 guide (Dybkær et al., 2012).

Researchers have dedicated considerable efforts to examine the capacity of Total Quality Management (TQM); it is a unique resource that generates competitive advantages in an organization (Bernal et al., 2014). In an attempt to improve services provision in the laboratories, numerous approaches to management have been pursued, most notably, and a recommended approach is the concept of TQM (Talib, 2013). Since the early 80s, the most lasting management theory in the developed countries has been Total Quality Management (TQM). There are various methods that can be used as a guide in its assessment. TQM does not limit itself to standard setting and quality control only, but it is also concerned with all aspects of the organizational management, concentrating on the processes as well as the product and making user satisfaction

a priority. Continuous improvement therefore becomes a very important element in health care services provision. Use of cost-effective laboratory tests will in future become increasingly important. Intelligent decision support systems should assist clinicians in ordering and using laboratory tests appropriately and more efficiently. Real-time electronic ordering (physician order entry) will ease the move toward rule-driven generation of orders rather than ad hoc ordering. Such pathology-driven test use may reveal that certain investigations are of little value and thus reduce costs and enhance quality of life (Naugler et al., 2015).

1.2 Statement of the Problem

Quality systems remain as the fundamental need for today's laboratory patient management. In Public health medical laboratories, the provision of medical health care requires adequate access to satisfactory services from the laboratory. Most significant illnesses require laboratory confirmation of the diagnosis, and laboratory monitoring of the patient after the diagnosis has been done. The importance of fair services provision in the functioning of health care in medical laboratories in developing countries has been universally recognized and accepted but has not been fully achieved. TQM practices in the Laboratories therefore would generate relevant, reliable and cost-effective results (Mayura, 2005). Quality systems remain the need of the hour for today's laboratory patient management and its key component is in its efficiency and accuracy in analyzing, reporting and documentation of results.

The quality of the medical laboratory services is important in achieving the national goal of improved healthcare; however, the healthcare sector Kenya faces a TQM challenge in the adoption of quality standards. Services quality is influenced by the competence of the laboratory services providers, who are the practitioners as well as the availability of the recommended working conditions as set by the Kenya Medical Laboratory Technicians and Technologists Board (KMLTTB). There are a set of standards for quality laboratory services developed by the KMLTTB based on WHO standards Kenya (Muturi & Gould, 2012), but Kenya has still very little concrete and reliable information on the actual levels of standard adaptation, and implementation, and the impact these guidelines have had on the health sector services delivery (Kamau, 2013). The quality of medical laboratory services remains a growing concern even as

medical diagnostic laboratories are undergoing the process of accreditation for quality services in line with WHO standards.

Without appropriate, adequate laboratory systems and support to patients, many cases of significant illnesses are likely to be misinterpreted, misdiagnosed, mismanaged which limits handling of the patient adequately thus leading to no optimum treatment these are challenges that most laboratories face, we find that most studies (Prajogo et al.,2004; Prajogo et al, 2005; Foster et al.,2008; Arumugam, 2009; Ogden, 2010) have dwelt on TQM and other fields but there is limited information on the laboratory services provision in a public county referral hospital a gap this study seeks to fill. Basing on the above scenario there is need to have documented evidence if there is influence of TQM in services provision in the regional public hospital laboratory.

1.3 Purpose of the Study

The purpose of the study was to investigate the influence of Total Quality Management on provision of medical laboratory services at Jaramogi Oginga Odinga Teaching and Referral Hospital (JOOTRH) in Kisumu County, Kenya.

1.4 Objectives of the Study

The study was guided by the four objectives

1. To determine how customer satisfaction monitoring, on influence provision of medical laboratory services at Jaramogi Oginga Odinga Teaching and Referral Hospital
2. To examine how leadership influences provision of medical laboratory services at Jaramogi Oginga Odinga Teaching and Referral Hospital.
3. To assess the extent to which Laboratory Staff influence provision of medical laboratory services at Jaramogi Oginga Odinga Teaching and Referral Hospital.
4. To determine the extent to which continuous improvement influences provision of medical services at Jaramogi Oginga Odinga Teaching and Referral Hospital

1.5 Research Questions

This study was to answer the following research questions

1. How does customer satisfaction monitoring influence provision of medical laboratory services at Jaramogi Oginga Odinga Teaching and Referral Hospital
2. How does leadership influence provision of medical laboratory services at Jaramogi Oginga Odinga Teaching and Referral Hospital
3. How does Laboratory Staff influence provision of medical laboratory services at Jaramogi Oginga Odinga Teaching and Referral Hospital
4. How does continuous improvement influence provision of medical laboratory services at Jaramogi Oginga Odinga Teaching and Referral Hospital?

1.6 Significance of the Study

Medical laboratory is one of the most integral parts in the health industry. It should be noted that it plays an important role, in this regard as a central part in daily disease diagnosis, surveillance, treatment, and outbreak investigations. The medical laboratory holds the key role to success and development of the health sector and results in the general well-being of a region. It is hoped that this study will try to answer a critical question that will assist administrators in the health sector that are facing poor prospects of growth in laboratory health sector, high population growth rates and competing health problems, plan for better resources allocation and cost control measures in the public health laboratory by avoiding wastage and optimizing on available resources by improving on them.

It is also hoped that the outcome of this research will be relevant to the Ministry of Health on ways to improve and deliver quality laboratory services, to the staff and management of the Medical laboratory and lastly to the clients. Achieving this goal “services delivery” would be impractical unless managers carry out a periodical assessment on their customer satisfaction and quality improvement based on the TQM principles which is a focus of this study.

It is also hoped that the research will be helpful to future researchers’ in the health industry who may wish to establish further quality models and relationships between TQM principles and

provision of services. The study may also form a significant reference material to researchers in conducting their laboratory TQM related studies.

1.7 Basic Assumptions of the study

It was assumed that all other extraneous factors not captured in could also affect services provision and prevent expected services delivery. The researcher further assumed that respondents will answer all the questions correctly honestly and accurately as had been provided in the questionnaire. In addition, the researcher also assumed that all the respondents will participate fully in the study. It was further assumed that TQM attributes in the project will absolutely influence provision of services in medical laboratory which could be of benefit to other referral hospitals. The study also assumed that the sample will be representative of the laboratory health sector at the hospital.

1.8 Limitations of the Study

The study was also limited by a number of factors; the difference in working hours for the medical personnel that were to be interviewed and also having their time amidst their busy schedule. This was solved by issuing the questionnaires earlier in the day and allowing them to fill at their own free time this would then be collected the following. There was no easy access to data as some of the people needed a lot of persuasions. This challenge was dealt with by convincing the participants that the information will be used for research purposes only and explaining or educating the respondents on the importance of the research.

1.9 Delimitation of the Study

Jaramogi Oginga Odinga Teaching and Referral Hospital (JOOTRH) is the largest referral hospital in Western region of Kenya comprising of the former Nyanza and Western provinces. JOOTRH has a rich traditional history of being one of the oldest major referral hospitals in Kenya since the 60's – patients get referred from all over the Nyanza region including Western region. It receives at least 500,000 patients annually that translate to around 1,365 patients daily (JOOTRH, emr). The hospital is located in an area with high disease burden compared to other regions; 15.1% HIV prevalence in Nyanza relative to 4.7% Prevalence in Western (KAIS, 2012), 38% malaria prevalence in Nyanza compared to less than 4% in the rest of Kenya (KMIS, 2010).

At least two thirds of the patients seeking medical attention at the facility are referred to the laboratory for various tests before any diagnosis is done. This is a relatively higher number compared to other level 5 hospitals in the region. The hospital therefore is in a unique position as a referral hospital compared to the other level 5 hospitals because of the population it provides services to.

1.10 Definition of Terms

Total Quality Management: A system implemented to ensure quality, a situation put in place to ensure that results produced are accurate, reliable and timely.

Customer satisfaction monitoring: Having an idea about value that services add to the customers, the customers are the patients, physicians, health care workers and laboratory technicians.

Jaramogi Oginga Odinga Teaching and Referral Hospital: The former Nyanza Provincial General Hospital (Russia) situated along Kisumu - Kakamega Road

Leadership: The Laboratory Director

Laboratory Staff: People who perform and document all tests / services provided in the lab

Services Provision: This is a term used to describe a wide range of activities including the provision of assistive devices, occupational therapy and health services including laboratory services.

Continuous improvement: A structured problem solving process to help identify root cause of a problem and remedy for that problem.

1.11 Organization of the Report

The study is organized in five chapters. Chapter one includes the background of the study the statement of the problem, the purpose of the study, the objectives of the study, research

questions, significance of the study, basic assumptions of the study, limitations and delimitations of the study, definition of significant terms and organization of the study.

Chapter two contains literature review, literature related to the study. Influence of Total Quality Management on provision of medical laboratory services, organized into four main themes which include customer satisfaction monitoring and provision of medical laboratory services, leadership and provision of medical laboratory services, laboratory staff and provision of medical laboratory services and continuous improvement and provision of medical laboratory services. The chapter also contains theoretical frame work, conceptual frame work and summary of literature review.

Chapter three describes the research methodology, this section covers; research design, target population, sample size, sampling techniques, data collection instruments methods, pilot test of the research instruments, validity of the instruments, reliability of the instruments, data collection procedures and data analysis techniques.

Chapter four presents data analysis, presentation, interpretation of the results and discussion

Chapter five includes the summary of the findings, discussions, conclusion, recommendation including contribution of the study to the existing body of knowledge and further research. Then there is section of references and appendices.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter focuses on the concept of quality improvement from its policy point of view and from the TQM gurus. This chapter will also discuss TQM practices as sub heading which include customer satisfaction monitoring, leadership, laboratory staff involvement and continuous improvement. Provision of medical laboratory services will act as a guide for the conceptual framework that will be displayed.

2.2 Concept of Total Quality Management in Projects

The quality management history arose from 'inspection' to Total Quality Management (TQM). In addition, it has modern 'branded interpretations' such as 'Six Sigma', that has led to the development of necessary processes, ideas and theories that are central to institutional development, change management, and the performance improvements that are desired for individuals, teams and institutions. The first time Total Quality Management was introduced to the western world was in 1957 by Armand V. Feigenbaum. He viewed quality control as a business method rather than technical, and believes that quality has become the single most important force leading to organizational success and growth. Since the early 80s it has shown to be the most consistent management theory in industries and businesses (Slack, 1995) & (Varnadoe, 1996).

There are a number of widely recognized approaches to quality management. Edwards W. Deming, Joseph Juran and Phillip Crosby are some of the most famous “quality gurus”. Deming introduced concepts of variation to the Japanese and later produced his famous “14 points for quality improvement”. Juran emphasized that quality is a continuous process. He believed that quality does not happen by accident and is part of planning control and improvement. Juran introduced the “pareto principle” or “85/15 rule while Crosby is recognized for his work on the cost implication of poor quality in his book “Quality is Free” (Slack, 1995) & (Varnadoe, 1996).

The TQM philosophy emanated from known earlier concepts of quality control (QC), which applies statistical methods to check specific outcomes; and quality assurance (QA), which

provides a platform for establishing quality standards. In the public health laboratory, QC may be defined as the control of the testing process to ensure that test results meet the desired requirements (Cembrowsky & Carey, 1989). Quality control in the medical laboratory is practiced prospectively, to provide information about the acceptability of the most recent analytical runs, or may be practiced retrospectively to provide information about past performance (Cembrowsky & Carey, 1989).

(Hassan & Kerr, 2003), found a significant relationship between TQM practices such as customer satisfaction monitoring, leadership, employee involvement, and continuous improvement as factors in performance or services provision (Kerr, 2003). Implementation of TQM therefore has a positive correlation between TQM and services provision (Bra & Tee, 2002). In addition, TQM initiatives generate significant positive gains in services provision and performance (Sanchez-Rodriguez, 2006). Total quality management is concerned with establishing a management system that has influence on services provision into the system activities, (and putting systems in place for preventing mistakes rather than detecting them), involves everyone, (internal and external customers), desirable staff training and puts special emphasis on customer satisfaction. TQM is a comprehensive, top-down and continuous approach to management and operations.

TQM can be approached through a six point strategy (Malapert, 2002). These strategies will be of guide in our assessment of TQM in laboratory services provision. The six elements are: Total commitment of the leadership; Prioritize to training and create an environment of continuous improvement; Control processes through standardization; Consider costs that relate to quality services and minimize on wastage; Provide quality laboratory services to all users; Establish a management and operation support for supplies, equipments, supervision of human resource; and Improve communication so that barriers are broken down between departments and sections..

Medical health laboratory services are an important part of a country's national medical health system, as they are important in disease diagnosis, prevention, and surveillance, treatment, and outbreak investigations (Nkengasong, 2009). A proper-functional laboratory services is a pivotal part of the medical health care system in the fight against HIV & AIDS, tuberculosis (TB), malaria and many other diseases (Mundy, 2012). In many industrialized countries, a functional

laboratory ensures a first-line response to support prevention, treatment, surveillance, and outbreak investigations.

In developed countries, the vast majority of medical decisions are based on medical laboratory tests; in the United States for example, billions of laboratory tests are performed annually, influencing an estimated 70% of all medical decisions (Silverstein, 2002). In Europe and central Asia, there was an initiative by World Health Organization (WHO) of strengthening laboratory capacities to support national programs (WHO, 2014). WHO advocates for, and continue to work with, member states to improve laboratory services through this initiative. Thus, building adequate and sustainable laboratory medicine capacity is essential in developing basic health care infrastructure. However, Medical laboratories in resource limited settings have been neglected and are not optimized to ensure accurate diagnoses (Gray, 1997 & Petti, 2006).

The majority of treatment decisions in many resource limited settings are based on clinical judgment and empiric diagnoses. Only a few simple microscopic and kit-based laboratory tests have become widely used at point of care such as HIV and malaria rapid diagnostic tests. The cost of treatment in the pediatric and adult wards was actually lower with accurate laboratory testing (Petti, 2006). Several plans from supporting international partners are underway to help strengthen laboratory infrastructure in this region (Global Fund, 2010). On realizing the crucial role that medical laboratories play in fighting HIV & AIDS, TB and malaria and the result in increased financial support sources; e.g. Global Fund to Fight AIDS, TB and Malaria, the President's Emergency Plan for AIDS Relief (PEPFAR) and many others building laboratory system capacity was the critical point for improving medical laboratories (Mundy, 2012).

Donor-supported laboratory's improvement efforts are first focused initially on developing appropriate technologies and providing equipment, supplies, and technical training. Focus on management and leadership weaknesses is not sufficient to weigh down on financial inputs or sustain improved laboratory performance and services. The situation is gradually changing with the focus on strengthening medical laboratory systems as part of overall national health systems strengthening. A key component of these initiatives is the enforcement of Effective services provision through accreditation by the International Organization for Standardization (ISO) 15189 (Kubono, 2007).

Researchers have dedicated considerable efforts to examine the capacity of Total Quality Management (TQM); it is a unique resource that generates competitive advantages in an organization (Bernal & Casarejos, 2014). In an attempt to improve services provision in the laboratories, numerous approaches to management have been pursued, most notably, and a recommended approach is the concept of TQM (Talib, 2013).

Since the early 80s, the most lasting management theory in the developed countries has been Total Quality Management (TQM) and there are several approaches which act as a guide in its assessment. TQM is broad and it does not limit itself to standards and quality control only, but it is also concerned with all aspects of the organizational operations management and it also concentrates on the processes as well as the product and making the customer a priority. While TQM is a top-down approach, it makes “end-user” its top priority and encompasses the philosophy of “kaizen”, continuous improvement (Mallapaty, 2001).

Continuous improvement therefore becomes a very important element in health care services provision. There is a crucial need for expanding Public laboratory services throughout sub-Saharan Africa. This is critical because of the region’s burden of disease. Laboratories in sub-Saharan Africa have been adversely affected by many factors, including political instability, corruption, unmotivated personnel, and lack of effective management systems, particularly in the governmental public sector (Gray, 1997). There is a need for increased investment in laboratory services to avoid compromising patient care (Petti, 2006).

In East Africa, Kenya also has a higher burden of HIV, TB and Malaria (KAIS, 2012 & KDHS, 2014) and Kisumu has more than double (14.9%) prevalence of HIV compared to the national prevalence (6.1%) (KAIS, 2012). Jaramogi Oginga Odinga Teaching and Referral Hospital (JOOTRH) is the largest referral hospital in Western and Nyanza province. The Public Medical laboratory is located within the hospital premises and will be the focus of this study.

2.2.1 Customer Satisfaction Monitoring and provision of medical Laboratory Services

TQM firms focus on serving both the external and internal customers. The services providers should first know the customers’ expectations and requirements and then should offer the products/services, accordingly. By the use of successful customer based focus efforts, production

can be arranged with respect to the customers' needs, expectations, and complaints. This ensures institutions provide high quality and reliable products on time at the right time and with increased efficiency and productivity (Zehir & Sadikoglu, 2012). When customers get what they want, their satisfaction will be increased and the firm's production and market share will increase.

Customer focus is the only TQM variable that significantly directly increases customer results. It has been found that customer focus is positively related to operational performance, customer results, and market and financial performance. If an organization knows the needs and expectations of the customers accurately and on time via frequent communication with and feedback from the customers, the firm can produce high quality, reliable, and timely delivered products or services (Zehir & Sadikoglu, 2012). Systematic measurement of customer feedback and its use in the product/services or process improvement can increase customer satisfaction. When an organization knows the customers' current and future needs, expectations, and complaints accurately and on time, the organization can invest in profitable areas and improve its sales, market share, and total profitability.

Research findings have established that quality planning is equally related to employee performance, social and moral responsibility (MacKelprang et al., 2012). If employees' opinions and suggestions are taken into consideration when developing the mission, vision, strategy and objectives of the institution then employees will support whatever suggestions that are made. This makes the employees feel like they belong to the institution and work hard with a high degree of motivation to achieve the Institutions' objectives and as a result, their absenteeism and intention to leave the Institution will reduce. The Society is also concerned about the conservation of the environment, and credit is given to the firms which contribute to environmental protection.

If an Institution develops strategies on quality and organizational objectives by considering its possible side effects to the environment or thinks of being environmentally sensitive and living standards of the society, the firm can reduce or eliminate pollution and noise, protect the environment, and gain a positive image in the society by being recognized.

A high-quality organization meets customers' needs. Medical laboratory managers often assume they know what customers want (accuracy, precision, speed, and economy among others) and set out to directly measure laboratory performance in each specific area. Another approach to measuring quality is to assess customer satisfaction with services without making any assumptions about the relative importance of specific functions. Each approach to assessing quality has advantages (Koh et al., 2014).

Direct assessment of accuracy, precision, and turnaround time help managers understand whether local performance is improving and how it compares to published norms. The quality of processes can also be examined in great detail: the turnaround time for troponin tests, for example, can be measured separately from the turnaround time for potassium tests. On the other hand, measurement of customer satisfaction brings customer preferences into the quality assessment process and corrects for mistaken assumptions about which particular aspects of services customers value most.

Today, assessing customer satisfaction with laboratory services is considered an important component of a laboratory quality assurance program. Physicians are one of the primary customers of laboratory services and obtaining their feedback provides laboratory managers with opportunities to identify areas for improvement. The CAP's Q-Probes laboratory quality improvement programme, which has produced numerous publications defining performance benchmarks in pathology and laboratory medicine, has been used to provide a standardized survey tool for assessing customer satisfaction with laboratory services. Previous studies have found that customer focus positively affects operational performance, inventory management performance, employee performance, innovation performance, customer satisfaction/results, and aggregate firm performance (Koh et al., 2014; MacKelprang et al., 2012; Zehir & Sadikoglu 2012).

Customers are the ultimate judges of both product and services provisions. Organization must take this into account. This eventually leads to customer acquisition, customer satisfaction, customer preference at all times, customer loyalty and the firm would constantly get positive referrals. Customer-driven success has current, continuing and future components i.e.; it gives the services provider an insight into understanding customer desires, and anticipating future

desires (Ogden, 2010). It was stated that TQM practices have significant effects on customer satisfaction (Yang, 2006). The adoption of TQM is an effective means by which companies can gain competitive advantage in customer focus (Yang, 2006).

Institutions must be knowledgeable in their customer's requirements and respond to customer demands. Customer satisfaction monitoring can be measured through TQM implementation (Zakuan, 2010). Customer monitoring has been described as the integral part of TQM, and there is emphasis on the management to understand customer needs, build relationships with them and fulfill their demands (Cai, 2009). Acquiring information on customer needs is one of the most widely used TQM practices that is used to improve quality performance of the organization (Hackman & Wageman, 1995).

Many factors may influence value and satisfaction over the course of time. These factors include the firm's customer relationship management, which helps build, confidence, trust and loyalty and importantly the quality of services being offered. Customer-driven success is a strategic concept. It is therefore for the purpose of customer retention, loyalty, market share gain, and growth. Therefore, customer-driven success demands a customer-focused culture and organizational agility (Foster, 2008 & Ogden, 2010).

In the context of health care laboratory services provision, the consumers are patients and health care workers (Mundy, 2012). End services-user satisfaction in this sense means; Services delivery in line with laboratory objectives on sustainability and reliable, reproducible and real time test-results, prompt handling of complaints. The provision of laboratory services was the main focus of the study and this was assessed by understanding time taken to receive feedback on the ordered tests, prompt update on tests , the reliability of test results received and staff professionalism were also checked.

2.2.2 Leadership and provision of medical Laboratory Services

The TQM approach is more than just meeting traditional rejection rate standards. The final result is the efficient and effective use of all institutional mechanisms in providing consistent quality at an acceptable price at that particular market rate. The philosophy works to link people and processes in the long term, in a system that alters the corporate culture to become one where quality is the key aspect of business strategy (MacKelprang et al., 2012). In cultivating the TQM

philosophy, strategy and implementation must involve a focused effort on the part of all employees within an institution. It has to be applied wholly. TQM requires that management, and every member of the organization, eventually commit to the need for continuous improvement in the way work is done. Business plans, strategies, management and operations require continuous review in order to develop a culture that puts emphasis on forces of the TQM perspective (Stokols et al., 2013). The challenge is to develop a strong culture where the idea of quality improvement is widely understood by all services providers across sections and becomes a principled, deep-seated value within each function area as well.

TQM process can be jump started by the leadership and by that the leadership becomes the role model and that gives him two main tasks: "serving our customers, and making a significant contribution to running the business." The stress on customer oriented services means that leadership must see other institutions in the firm as their customer groups for whom making continuing improvements in services becomes a necessity (White et al., 2013).

In order to achieve TQM, leadership must commit to its principles by receiving regular feedback from its internal and external customer on current hour services. Leadership should include feedback from its customers in setting objectives performance standards and measures. Furthermore there are a number of specific principles that leadership can model. TQM adds to management and operation costs and in return ensures quality in overall process. TQM starts with leadership, an active and effective involvement gives an impetus to empowered staff. The aim is to reduce errors and thereby costs and to do things right the first time. The overall operation and management is transparent to all staff. All this helps the lab to benchmark itself and move towards the next goal, which is accreditation. The laboratory director or administrator exercises fewer technical skills, rather, the emphasis shifts at this level to conceptual skills such as long – range planning, goal setting, and innovating in response to change. The administrative or chief technologist in the middle is required to exercise skills in both the technical and conceptual areas (Nyongesa et al., 2015).

All three levels of laboratory management need to be equally clever in interpersonal skills. Human relations skills in a laboratory are of critical importance to managerial effectiveness. The clinical laboratory is staffed by a wide variety of backgrounds and educational preparation, from

unit's clerk through doctorate – levels. The cohesion of this group as a healthcare team is essential for effective management. The clinical laboratory administrator is a manager of professionals. Laboratory supervisor manages things but leads people. Leaders must play a pivotal role in taking responsibility for preparing, reviewing and monitoring the policy, and take part in regular improvements and ensure that it is understood at all levels of an organization. The mark of effective leadership starts with the development of a mission statement, followed by a strategy, which is translated into action plans throughout the organization (White et al., 2013).

These, combined with a TQM approach, should result in a quality organization, with satisfied patients and good results. The five requirements for effective leadership are: developing and publishing beliefs, values and vision/objectives, often as a mission statement and as for, developing clear and effective strategies and supporting plans for achieving the mission and vision/objectives, reviewing and improving the management system, communicating, motivating and supporting the laboratory staff and encouraging effective employee participation.

A leader in an organization should set a mission and vision for the organization, create a customer focus, demonstrate clear and visible organizational values and ethics, and set high expectations for the work force (Foster, 2008 & Ogden 2010). Leaders also ensure the creation of strategies, systems, and methods for achieving performance excellence. Senior leaders should inspire and encourage entire workforce to contribute, to develop and learn, to be innovative, and to embrace meaningful change, their personal involvement in planning, providing a supportive environment for taking intelligent risks, communicating, coaching and motivating the workforce, developing future leaders, reviewing organizational performance, and recognizing workforce members and as role models, they can reinforce ethics, values, and expectations while building leadership, commitment, and initiative throughout the organization (Ogden, 2010).

Previous studies in TQM have emphasized on the important role of leadership in its implementation in the institutions (Ooi & Young, 2008 & Zakuan, 2010). Senior leaders and managers not only guide the organization but also assess the organizational performance (Teh, 2008). Top management commitment to quality management is an absolute precedence for preparing organizational culture before TQM practices can be implemented (Mallapaty, 2001 & Antony, 2002).

Leadership commitment significantly affects services provision/ performance (Arumugam, 2008). In addition, there is a huge effect on improving a firm's services provision which is through supporting, implementing, reinforcing services and practices (Kaynak, 2003). Organization with higher leadership competencies are better at implementing TQM and also produce products and services of higher quality (Das, 2011). Leaders can facilitate staff members to achieve the expected level of services provision (Perez, 2012).

Leadership and services provision in Medical laboratory is a key component of the laboratory infrastructure which needs to be a well-organized management system. Where by each job title in the management structure has distinct responsibilities that are well documented. The unit heads primarily oversee the daily operations of the laboratory activities and are involved in the development, implementation, maintenance, and improvement of systems in their specific units. All levels of laboratory management are charged with ensuring that continuous communication on expectations and procedures exists among the staff so that complaints can be quickly identified, addressed, and resolved. In a situation where the leadership in the laboratory is not in place then the provision of services will be affected.

2.2.3 Laboratory Staff and provision of medical laboratory Services

TQM is an approach to improving the ability of a firm to perform above others, effectiveness and flexibility of an organisation for the benefit of all that require the services. TQM is a way of planning, organising and understanding each activity within a firm, removing all the wasted effort and energy that is sometimes spent in organisations. It ensures that the leaders accept and adopt a strategic overview of quality and put their efforts in prevention and not detection of problems (Dybkær et al., 2012). It involves all employees in an organisation and for it to be successful; it must start at the top with the leaders of the organisation. All medical laboratory staff must demonstrate their seriousness and commitment to quality, and ensure they communicate the principles, strategies and benefits to the people for whom they have been given the responsibility.

The ISO 25 guide is appropriate and allows for professional judgment by personnel who have an applicable and practical background. This requirement is difficult to assess because it lays

between the assessment of the laboratory as an organization and the assessment of personal intellectual capabilities of the staff members.

Clinical evaluation is essential and requires fundamental practical analytical and medical knowledge. This knowledge is sometimes not available in some laboratories. New technology ensures laboratory's can measure drug levels. A quality system guarantees a correct analytical result (Moen & Clifford, 2010). However the interpretation of results requires fundamental and practical knowledge of pharmacokinetics, therapeutical range and metabolism. Knowledge of Results without medical validation are worthless for the clinician; yet currently many mistakes are observed in the information given to clinicians because of a lack of knowledge by laboratory staff. The rapidly changing techniques and the introduction of new tests will require a continuous training of laboratory staff. Although continuous training is a must in each profession, a mandatory system has been installed in several countries for medical staff (Aubrey, 2015). In systems such as these, a number of CFU (continuous formation units) must be collected periodically during the year. However this system does not guarantee that medical laboratory staff has real competence for all those analytes performed in their laboratory. This knowledge concerns new technology, such as DNA amplification techniques and also new applications of well-known technology.

Laboratory staff participation at all levels is a must for effective services provision system that is for the current and future product or services (Deming, 1986). If employees fully participate in services improvement activities they acquire new knowledge, realize the benefits of the quality disciplines and obtain a sense of accomplishment by solving problems (Zhang, 2010). Organizations should utilize employees' skill and abilities to gain services provision to the fullest (Talib, 2013).

Previous studies have found out that employee training is a key element for achieving an organization success (Kaynak, 2003); In addition, it has an important impact on reducing cost and improving operational and management performance and productivity (Ahire & Dreyfus, 2000 & Kaynak, 2003). Employee training and education play a critical role in maintaining high level within the services provision industry (Rahman, 2010 & Talib, 2013) and between training and education there is a positive correlation, and organization performance (Vermeulen & Crous,

2000). Nonetheless, in resource limited settings there are few trained laboratory technologists and technicians.

There has been financial and technical support from the President's Emergency Plan for AIDS Relief (PEPFAR) program that called for the training of 140,000 health care workers, including laboratory experts (Whitehouse, 2008). This unique opportunity addresses a wider variety of laboratory training needs and it will further help in dealing with career progression and continued education opportunities resulting in the development of a sustainable cadre of key personnel. Of note, ensuring that trained laboratory staff, have access to modern and well-functioning laboratory equipment is essential.

The study therefore assessed this component through staff involvement in decision making, challenges with new targets, and rewards for jobs well done.

2.2.4 Continuous Improvement and provision of medical laboratory Services

TQM is concerned with continuous improvement in all areas of work, from strategic planning and decision-making, to detailed execution of work elements (Hall & Vogel, 2013). It comes from the notion that errors can be avoided and defects prevented. This leads to continuously improved results in an institution as a result of improved capabilities, processes, technology and machine capabilities which leads to organizational success.

Continuous improvement deals with improving results and improving capabilities to give better results in the future. The five major areas for capability improvement include demand generation, supply generation, technology, operations and people's capabilities (Dybkær et al., 2012). A central principle of TQM is that mistakes made by people, and most of them are caused due to faulty systems and processes. This means that the causes of mistakes can be identified and eliminated, and is preventable by changing the process. Continuous quality improvement ensures that medical laboratory services continue to meet the expectations of services users and that they are developed with their end needs in mind. A commitment to horizon scanning helps to predict developments and trends and consider the factors that can influence outcome in these processes.

Processes should be continuously improved through quick, interactive systems and change. Putting up of a joint network system can improve efficiency by exploiting economies of scale,

maximizing capacity utilization, satisfactory process design, and reduced input costs. Joint networks bring about additional value through harmonization of laboratory test results within the network. Importantly, laboratory professionals give value-added knowledge services, by providing all inclusive consultative support to medical practitioners and fostering evidence-based medical laboratory medicine. The increased interaction of “customer intimacy” with the medical practitioners who order the laboratory tests should create additional value (Naugler et al., 2015).

Finally, Medical laboratory professionals (especially those working at university hospitals and referral hospitals) should focus on more academic tasks such as new innovations i.e “product leadership” (Naugler et al., 2015). In a prospective study, (Kilne and Milne, 2010) demonstrated that introducing a management support system for requesting laboratory tests in primary care results in cost savings. Once pathology-driven utilization is implemented it is important that the knowledge base is continuously revised, maintained and improved.

Continuous improvement relies on the philosophy of improvement initiative that increases success and reduces failure (Juerrgensen, 2000). This is the most important part of services provision, and involves searching for unceasing improvements and developing processes to find new or improved methods in the process of turning inputs into useful outputs (Talib, 2013). Continuous improvement helps in reducing the process of variability, therefore improving output performance continuously (Sadikoglu & Zehir, 2010). The best way to improve organizational services provision in TQM is to continuously improve the performance activities.

(Arumugam, 2008) found that continuous improvement is assumed as the dominant TQM practice in quality performance. In this context, continuous improvement is also a key component of good laboratory management (Mallapaty, 2001). Establishing quality standards requires a careful assessment and informed implementation via multiple approaches, which usually takes time. It is paramount to identify and monitor improvement opportunities through a scheduled routine assessment of indicators. Regular trainings on new aspects were assessed and how the non-conformities are dealt with. The laboratory’s was assessed whether or how often they bench mark with other laboratories.

2.3 Theoretical Framework

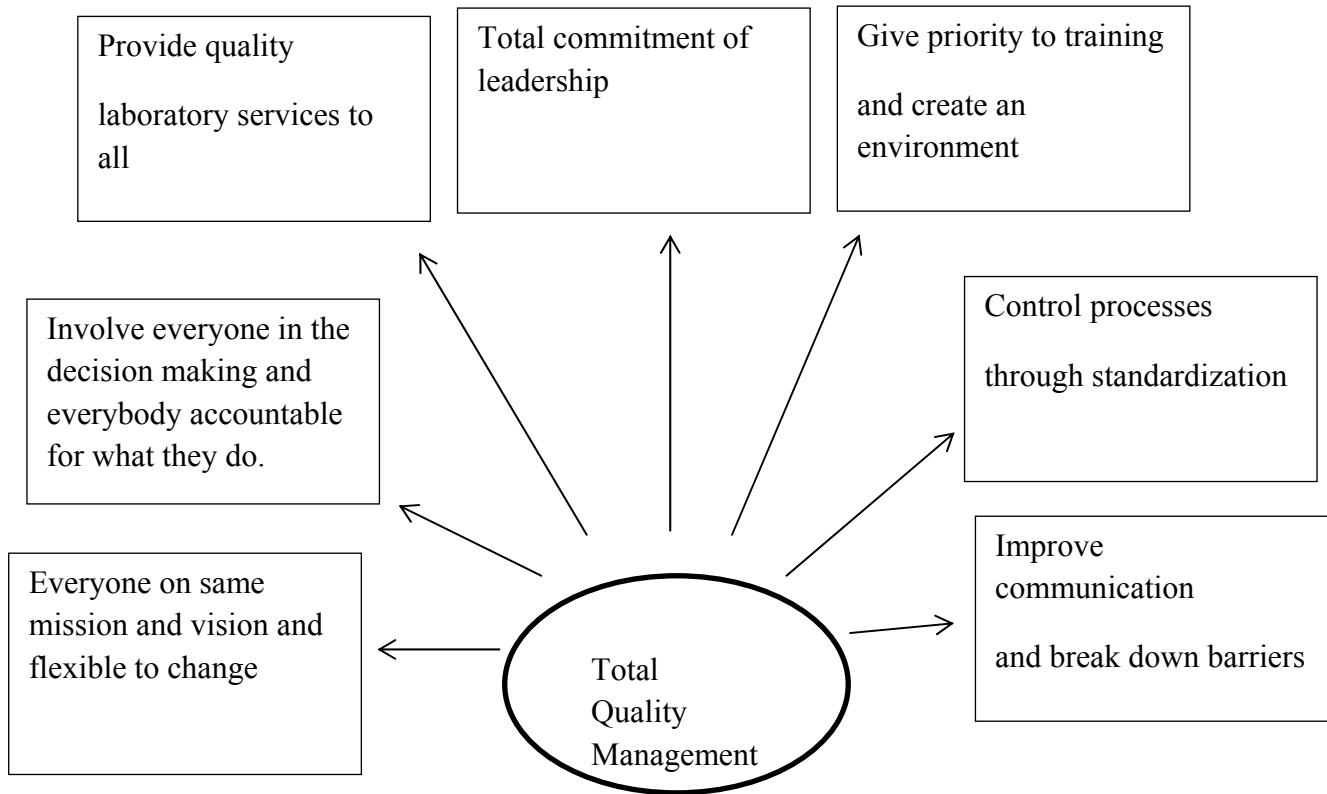
The study is based on Philip B. Crosby Ideology of conformance to quality standards. Crosby's most popular definition of quality is: "Quality is defined as conformance to requirements". He says that poor quality is not an "outcome of a failure", instead, poor quality is what deviates from set standards. According to him, quality management is a philosophy, a gathering of concepts that establish an organizations management style and policy. This is the "Good Ship Integrity" that morally and physically supports everything else. When management acts and works in accord with the concept of quality management, then the organization can put useful "systems" to work and this is supposed to be in built in the processes. To cause quality management an organization must deliberately create an environment where all transactions are completed correctly each time, and where relationships with employees, suppliers, and customers are successful. On employee engagement, quality assurance is work discipline, a gathering of procedures that document what people are supposed to do. This is intended to organize information for the intent of building a path for work to follow. On management commitment, he discussed the need for quality improvement with management, emphasizing the need for defect prevention.

According to Crosby, organizations should aim at zero defects. This approach would help organizations improve quality substantially. However, he noted that defects or non-conformance cannot be completely eliminated. He believed that one cannot stop operators from making mistakes. Organizations must not expect their employees not to make mistakes. Thus he stressed on the need for an approach to constantly reduce defects. He also discourages organizations from being complacent after reaching high quality standards. Quality is a continuous improvement process and must be aimed at pushing the envelope of quality even further. This can be elaborated through a seven point umbrella strategy.

The seven strategies will guide in the assessment of TQM in services provision in the laboratory. The strategies are; customer satisfaction monitoring, commitment and support from the leadership; Give priority to training staff involvement and create an environment of continuous learning; Control processes through standardization; Considering of inputs that relate to quality services and reducing of overall total costs; Provide quality laboratory services to all users; Involve everyone in the decision making and everybody accountable for what they do, provide

quality laboratory services to all users, provide support system and supervision; and Improving communication and breaking down barriers between departments so that all staff is on the same mission and vision and are flexible to change.

Figure 1: The Umbrella of Total Quality Management



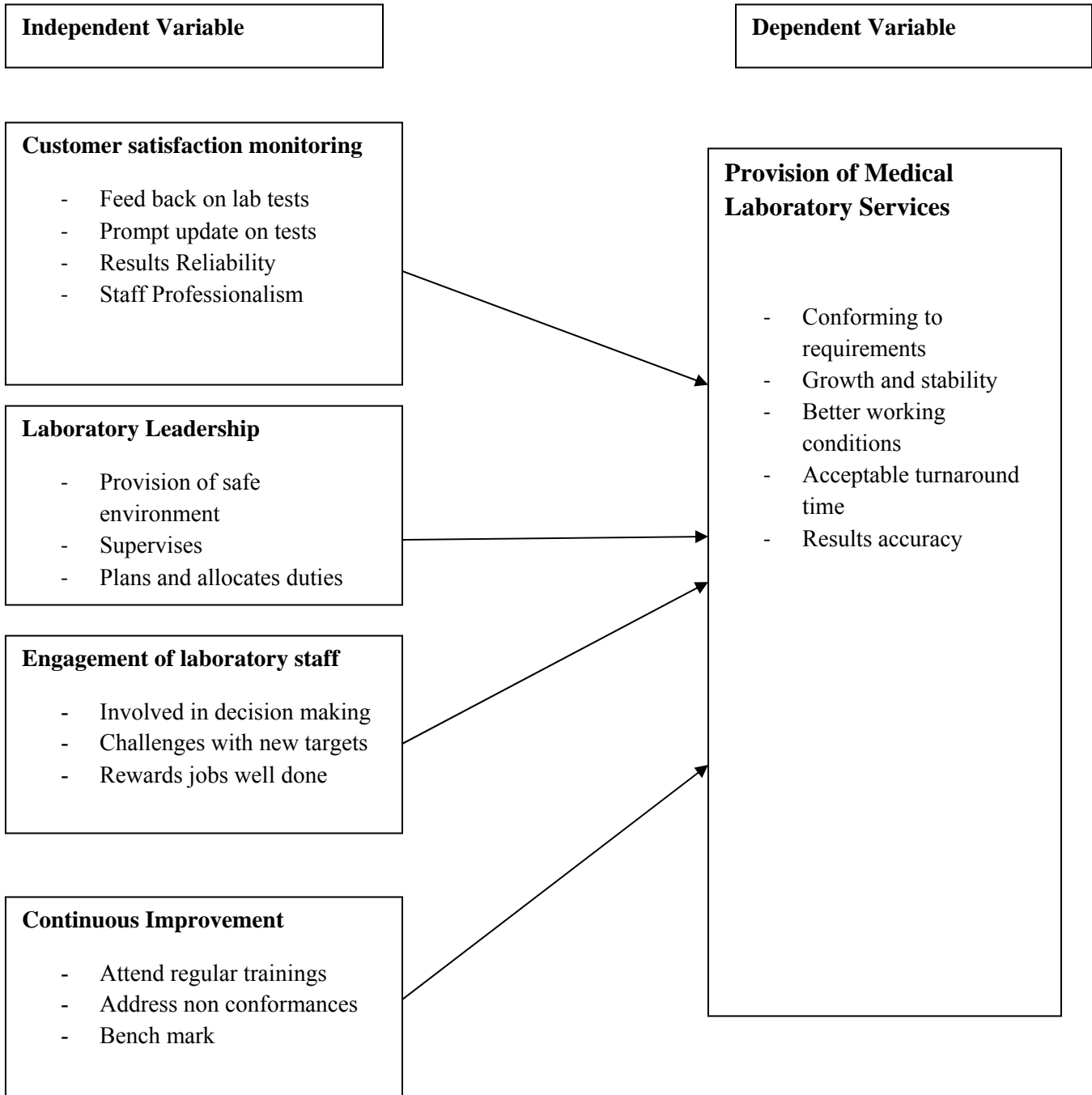
TQM requires top management support as health care services in developing countries operate under challenges of limited resources, high demands and competing health problems. Health facilities often experience unequal allocation of resources at different levels and, workforce categories at various departments and this particularly affects public health laboratories. TQM also requires services-user satisfaction which means, reliability, reproducibility and timely test-results and services delivery in line with organizational objectives. TQM puts special emphasis

on training which relates to well-trained employees makes more efficient team members. Laboratory services need a workforce of competent, responsible, autonomous and flexible employees to accomplish organizational objectives and provide the quality of services required. TQM brings quality into work processes. TQM decreases the reliance on quality assurance alone by building quality into every aspect of the organization. Improving work processes through standardization and better training of staff. It is about continuous improvement and this is a crucial factor for the success or failure of any quality improvement program. TQM is empowerment and includes everybody. The notion of TQM is still relatively new to health care workers in less developed countries. It might prove to be an effective tool in improving the quality of services and requires systematic and nationwide efforts, to transform the group of laboratory personnel into a productive and efficient team. This is in line with what the research study will tend to find out as it will focus on customers, leadership, employee engagement and continuous improvement.

2.4 Conceptual Framework

The conceptual framework that is displayed shows the dependent and independent variables that the project will focus on. Services provision in the laboratory will be measured on customer satisfaction monitoring, leadership employee engagement and continuous improvement.

Figure 2: Conceptual Frame work on provision of medical laboratory services



2.5 Summary of Literature Review

This chapter has introduced the role of TQM practices, thus explaining the introduction of TQM systems, the significance of TQM, the concept of TQM practices, and the relationship between TQM practices and services provision. Four TQM practices associated with services provision has been further discussed. They include customer satisfaction monitoring, leadership, laboratory staff engagement and continuous improvement. The chapter has also discussed both the theoretical and the conceptual framework that will act as a guide in the data collection and analysis so as to answer the research questions. It is concluded by describing Essential laboratory services.

Under customer satisfaction monitoring the scholars pointed out that proper monitoring of customers have positive influence on services provision making customers happy is a sure way of retaining the customers available and the importance of understanding the customers.

Related literature on leadership pointed out that leaders are not only to give direction but also to formulate policies that encourage continuity and encompasses all aspects of an organization. They pointed out that strategy would see organizations move forward and be current. They further argued that leaders should lead by example and be role models in their leadership and provide a secure and safe environment for their workers. With that the scholars concluded that when the above happens then leadership will definitely influence provision of services.

On engagement of laboratory staff in decision making the scholars pointed out that this would positively influence services provision in that when the staff is involved they feel part and parcel of the processes and own them, this would in return make them independent and handle challenges on their own.

Related literature was reviewed in relation to continuous improvement with keen interest to understand areas of training in relation to continuous improvement and bench marking. It was noted that continuous improvement positively influence provision of services in that the world is dynamic and keep changing everyday so everyday there are new challenges new ways of doing different laboratory tests. When laboratories bench mark it moves them a notch higher to embracing higher standards.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the methodology that was used in conducting the study in order to get information aimed at meeting the research objectives and answering the research questions. This are described under the following headings; research design, target population, sample size, sample selection, research instruments, data collection procedure, data analysis and ethical considerations.

3.2 Research Design

This study adopted descriptive research design as it is the most predominant design employed in social sciences and can also be used to show correlation between variables (Kothari, 2004) as is the intention with this study. The method was preferred because it ensured complete description of the situation making sure that there was minimum bias in the collection of data and finding out the what, where and how phenomenon. Descriptive research is used when manipulations are not possible and when descriptions as explained above are desired (Amin, 2005); Influence of TQM in the processes at the hospital laboratory are management issues that are guided by the hospital standards and management they are beyond the researchers control and as such can only be described as they are and as they occur. It is the inability to manipulate that makes the research design ideal for this study.

3.3 Target Population

The study targeted 150 staff members of Jaramogi Oginga Odinga Teaching and Referral Hospital. These included the laboratory staff, nursing staff, doctors, clinical officers, counselors and management staff who derive their services from the laboratory.

3.4 Sample size and Sampling procedure

This section describes the sample size and sampling procedure that was used in the study.

3.4.1 Sample Size

According to (Krejcie and Morgan, 1970) table, the study used sample size of 108 individuals. (Appendix iv)

3.4.2 Sampling Procedures

Simple random sampling method was used during the data collection. In JOOTRH the human resource department has data base containing all staff and their and sections where they work. From a list of all the 150 staff dealing with the laboratory, the researcher was able to draw a sample random of 108. Simple random sampling technique was used such that a computer was used to generate a series of random numbers. A list of all staff dealing with the laboratory was entered in an excel sheet. A function =RAND () was used to generate random numbers between 0 and 1, then sorted both columns with the list of names and random numbers. This re-arranged the list in random order from the lowest to the highest number. Then the first 108 staff in the sorted list were selected. The study used simple random sampling because it is easy to use and generate numbers very fast and it is not prone to bias. The research assistant then approached the sampled staff at their work stations and explained about the objective of the study, then proceeded to collect data.

3.5 Data Collection Instruments

(Mugenda and Mugenda, 2003) observed that, the pre-requisite to questionnaire design is definition of the problem and specific study objectives. The data was collected using closed ended questionnaires. The questionnaires gave a comprehensive view of what the objectives of the study were. The questionnaires were divided into different sections, intended to extract specific information from the respondents. Each section addresses specific study objective and by extension sought to answer specific research question. Section A was to obtain information related to respondents profile, section B to obtain information on customer satisfaction monitoring and provision of services., section C to obtain information on leadership and provision of services section D to obtain information on laboratory staff engagement and provision services , section E is to obtain information on continuous improvement and provision

of services. Effort was made to ensure that all objectives are addressed and information accurately collected.

3.5.1 Pilot Testing

To ensure data collection instruments were reliable pretesting and practical interviewing was conducted by the researcher with 10 staff who were not part of the sample (from the remaining main sample size) and working at the hospital laboratory. The pilot-testing was done to ascertain whether the instruments for data collection are reliable in answering research questions as expected and to remove any irrelevant questions before presenting to the actual population (Nachmias and Nachmias, 1996). The pilot-testing helped to assess the clarity of the instruments and the ease the use of the instrument. It helped in capturing important comments and suggestions from the respondents were used to help in the improvement of the instrument.

3.5.2 Validity of the study

Validity is the accuracy and meaningfulness of what the study wants to capture, this is basically based on the results. Validity is a measure of extent to which the instrument measure what they are intended to measure (Kathuri and Pals, 1993) to ascertain content validity the study subjected it's instruments to discussions with the supervisor who are professionals to ensure the instruments capture the relevant data and answer the research objectives. During the pilot testing, vague questions and unclear instructions were noted. Important comments and suggestions were also captured from the respondents that enabled the researcher to improve efficiency of the instruments. The responses from different participants were analyzed and came up with a generalized position which stood the validity test.

3.5.3 Reliability of Instruments

Reliability is a criterion used to find out if there is consistency of data from the use of a particular method. A measure of reliability to the extent that repeated application of it under the same condition by different researchers will give the same results (Taylor, 2008)

The results would be the same after repeated trials. Although unreliability is usually present to some level, there should be consistency in results collected by a quality instrument at different times. The tendency towards consistency that is found in repeated measurements is referred to as reliability (Cook et al., 2007). The questionnaires were administered to first 10 selected respondents from the study population and again after sometime when then main study was

going on they were re-administered again to the same group. Correlation between test and re-test were factored into statistical package for social science (SPSS) the results of the first test were correlated with that of the second test.

The Carl Pearson's formula for correlation was used as follows;

$$r = \frac{\sum(X - \bar{X})(Y - \bar{Y})}{\sqrt{\sum(X - \bar{X})^2} \sqrt{\sum(Y - \bar{Y})^2}}$$

Where:

r =Karl Pearson coefficient of correlation

X =Values of the first test

Y =Values of the retest

–

X = mean of the first test

–

Y = mean of the retested

3.6 Data Collection Procedure

After the proposal was approved the researcher got permission to carry out the research from the University of Nairobi and was issued with an introductory letter. Thereafter the researcher sought permission for data collection from National Council of Science and Technology. After successful application the researcher visited the JOOTRH where the hospital authorities requested the proposal to be presented to their Ethics committee for an approval. For high response rate the researcher ensured that the research Assistant who was involved in data collection was trained in research ethics, data collection process and use of data collection tool. The researcher made sure the questionnaires were clearly printed and given to the research assistant who went and distributed to the respondents. After distribution the respondents and the assistant agreed on when he could collect the questionnaires.

3.7 Data Analysis Techniques

According to (Kothari, 2009) data analysis involves operations which are performed with the intension and purpose of summarizing collected data, putting them together organizing them in a

manner that they answer research questions. This study made use of descriptive methods of data analysis to analyze the data. After data collection, the questionnaires were checked for completeness, cleaned, organized, coded and then entered into an excel sheet and SPSS for analysis. Descriptive statistics in the form of frequency distribution, percentages and averages were produced using statistical package for social scientists (SPSS) while tables were generated using MS-Excel. Data was presented using frequency and percentage tables. Descriptive statistics was generated for age, gender and education and attributes of the TQM components.

3.8 Operationalization of variables (Table 3.1)

Variables	Indicator	Measuring scale	Analysis
Customer Satisfaction Monitoring	<p>Feed back on lab tests</p> <p>Prompt update of tests done in lab</p> <p>Results reliability</p> <p>Staff professionalism</p>	Ordinal (1-5)	Mean, percentage,
Leadership	<p>Provision for safe environment</p> <p>Adequate supervision</p> <p>Plans and allocates duty</p>	Ordinal (1 - 5)	mean, percentage
Lab staff engagement	<p>Involves lab staff in decision making</p> <p>Challenges lab staff with new targets</p> <p>Rewards lab staff for job well done</p>	Ordinal (1-5)	Mean, percentage
Continuous improvement	<p>Regular trainings for lab staff</p> <p>Address non conformances</p> <p>Bench marking</p>	Ordinal (1-5)	Mean percentage.

3.9 Ethical Issues in Research

The researcher took care of all the ethical concerns in the research; the research proposal was first reviewed by scholars at the University of Nairobi School of distance and continuing Education and National Commission For Science, Technology and Innovation (NACOSTI). Before data collection at the Hospital the Ethics review committee also reviewed the proposal and issued an approval letter. The Researcher re-assured the staffs who were involved that all information they give to the study will be treated with a lot of confidence. The researcher sort the individuals' verbal consent to participate, the researcher also assured the study participants that participation is voluntary and all the information they provide would be used for research purposes only. Furthermore the research questionnaires did not have a place for a name thus all information remained anonymous.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATIONS, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter presents the study findings of the data analyzed, interpreted and discussion under subsections in line with the study objectives. The sub-sections include, questionnaire return rate , demographic Information about the respondents on determining how customer satisfaction monitoring as a component of TQM influence medical laboratory services provision, examining how leadership as a component of TQM influence medical laboratory services provision, assess the extent to which employee engagement as a component of TQM influence medical laboratory services provision, determine the level to which continuous improvement as a component of TQM affect services provision in the medical laboratory and influence of staff culture on the relationship between TQM implementation and medical laboratory services provision.

4.2 Questionnaire Return Rate

A total of 108 questionnaires were developed and distributed to employees of JOOTRH hospital laboratory staff and to members of staff who walked in to the laboratory to get services. The study managed to receive 97/108 (89.81%) Interviews back duly filled. Table 4.1 shows response return rate.

Table 4.1: Response Return Rate

Total Number of Participants	Participants interviewed (n)	Return rate (%)
108	97	89.81

Table 4.1 shows that a total of 108 questionnaires were distributed to the respondents however the study managed to receive 89.81% interviews back duly filled and successfully returned. The positive response rate could be attributed to the level of understanding of the individuals who participated in the study.

4.3 Demographic characteristics of the Respondents

This section represents the demographic characteristics of the respondents who were involved in the study. The respondents' demographic characteristics that were examined were gender and age categories. The respondents were asked to state their age, gender and level of education, this was to give a better insight of who were the majority in gender and age.

4.3.1 Distribution of Respondents by age category

The study sought to establish the ages of the respondents who were interviewed with the view of knowing and understanding the population. This was going to give information on which age understands and accepts issues of TQM better. The respondents were then requested to state their ages. Table 4.2 shows the age distribution.

Table 4.2: Distribution of Respondents by age category

Age Category (years)	Frequency	Percentage %
18-28	21	22
29-38	51	52
39-48	20	21
>49	5	5
Total	97	100

Table 4.2 shows that out of those who responded, their ages ranged from 18 years to more than 49 years. Majority of respondents were from the age bracket of 29-38 years, 51(52%) followed by those aged between 18 – 28 years 22(21%). The age bracket of 39-48 years were 20(21%), the age bracket of > 49 were the least with 5(5%) participants. From the data we find that majority of the respondents fell between the age category of 29-38 years. This is a generation

that has a lot of experience and the perception is that they have been in services for a long time and therefore they are people who may understand what they are doing.

4.3.2 Distribution of Participants by Gender

The study found it important to analyze gender distribution of the respondents. This was important to understand the gender of those involved in the study. Due to this the respondents were asked to state their gender. The results were given in table 4.3.

Table 1.3: Distribution of Respondents by Gender Category

Gender	Frequency	Percentage %
Female	50	51.5
Male	47	48.5
Total	97	100

Table 4.3 shows that females were the majority with frequency of 50 and 51.5%. Males were 47 with a percentage of 48.5%. Female respondents were the majority this could be due to their nature of responsiveness to issues that have got to do with healthcare.

4.3.3 Distribution of Respondents by Education level

The study sought to establish the level of education of the respondents. This was to help solicit for information, the respondents were asked to state their highest level of education. This was going to help the researcher establish whether level of education had influence on TQM in their processes and also to understand if the education level would have anything to do with their understanding of TQM. Table 4.4 shows the distribution of respondent's education level.

Table 4.4: Distribution of Respondents by Education Level

Education Level	Frequency	Percentage %
Certificate	29	29.9
Diploma	49	50.5
Bachelors	15	15.5
Masters	4	4.1
Total	70	100

Table 4.4 shows that the majority of respondents were distributed at Diploma level of education with a frequency of 49 with 50.5%, Diploma education may have been attributed to laboratory technicians and nurses who majority get their training from Medical Training College (MTC), Certificate level of education at 29 with a 29.9%, (15 15.5%) Bachelors/Under graduate degree. There were 4 (4.1.49%) participants with a Masters Degree Education.

4.4 Customer Satisfaction Monitoring as a TQM component on services provision

For a successful services provision the customer satisfaction monitoring is essential for success. This is because the services provider will be predicting the customer behavior to exceed the customers' expectation. People working within the hospital who use laboratory for their services are the customers, it is essential that the services provider understands their customers' needs therefore. This study sought to find out if there is influence on services provision due to customer satisfaction monitoring. To achieve this, the respondents both customers and staff were requested to respond to various questions under the following themes which would give insight to the above objective; time taken for giving feedback, whether they get timely information from the lab, satisfaction with professionalism and results reliability. If an organization knows the needs and expectations of the customers accurately and on time via frequent communication with and feedback from the customers, the firm can produce high quality, reliable, and timely delivered products or services (Zehir & Sadikoglu, 2012).

4.4.1 Feedback on laboratory test requests

Researcher sought to find out whether those who requested for tests from the laboratory got their feedback in good time to enable them proceed with the decisions on making their diagnosis. It is important that laboratory tests results are received in good time for proper services delivery. This was done by respondents responding to agreeing or disagreeing to; whether they are satisfied with the time taken by the laboratory to give them their feedback on laboratory requests. The summary of the responses are as shown on table 4.5.

Table 4.5: Feedback on laboratory test request

Response	Frequency	Percentage %
Strongly Agree	10	10.3
Agree	62	63.9
Neutral	17	17.5
Disagree	8	8.2
Strong Disagree	0	00
Total	97	100

From table 4.5 shows that 10(10.3%) participants strongly agreed that feedback time for receiving laboratory results was adequate, 62(63.9%) agreed, while it was observed that 17(17.5.) were neutral and 8(8.2 %) disagreed. Over 50% of the respondents agreed with the time taken to receive feedback on laboratory results.

4.4.2 Timely Information on New tests

Giving information on new tests available in a medical laboratory is important in that most of the new information would come in handy to assist the general public. The public would not travel long distances in seeking laboratory tests when they know it could be easily available within their reach by asking if the laboratory keeps informing them of the new tests available, when the respondents were asked whether the laboratory keeps informing them of new tests available their responses were as follows in Table 4.6.

Table 4.6: Timely Information on New Tests

Response	Frequency	Percentage %
Strongly Agree	4	4.1
Agree	48	49.5
Neutral	28	28.9
Disagree	13	13.4
Strongly Disagree	4	4.1
Total	97	100

Results above show that a frequency of 4 with a percentage of 4.1% strongly agreed that they get timely information on new tests while 48 respondents at (49.5%) agreed, 28(28.9%) disagreed while 13(13.4) were neutral; the laboratory would be more concerned about the 28.9% who are neutral. Slightly more than 50% of the respondents agreed that they get new information on new tests. With 13.4% and 4% disagreeing and strongly disagreeing respectively this indicated poor communications from the laboratory as per new tests are concerned.

4.4.3 Professionalism in the laboratory

Professionalism is an important aspect of any provision of services in any sector. Medical laboratory have both internal and external customers that would expect any staff in the laboratory to be professional in their work this is because we know professionalism is key when it comes to any services provision, without professionalism especial in medical laboratory most of the tests would be mixed up and patients get wrong diagnosis or most importantly laboratory staff would be careless and even hurt themselves in the process by spillage and splashing of specimen all over and this would compromise work ethics and customers would in the end lose confidence in the laboratory. The main purpose of the study was to know whether all the staff carries out themselves in a professional manner in the laboratory. When the respondent were asked whether the laboratory staff handles customers, issues in a professional manner the responses were as shown in table 4.7.

Table 4.7: Professionalism in the Lab

Response	Frequency	Percentage %
Strongly Agree	14	14.4
Agree	56	57.7
Neutral	22	22.7
Disagree	2	2.1
Strongly Disagree	3	3.1
Total	97	100

Table 4.7 shows that those who strongly agreed had a frequency of 14 with (14.4%) strongly agreed, 56 (57.7%) agreed, 22(22.7%) were neutral, 2(2.1%) disagreed and 3 (3.1%) strongly disagreeing. Majority of the respondents approved the professionalism in the laboratory with more than 70.00% agreeing.

4.4.4 Reliability of Results

Results reliability is an important aspect of the laboratory, without reliable results patients would end up having wrong diagnosis leading to more fatalities. The researcher wanted to know to what extent the respondents agrees that results are reliable. When the respondents were asked whether they are satisfied with reliability of results they responded as below in table 4.8.

Table 4.8: Results Reliability

Response	Frequency	Percentage %
Strongly Agree	7	7.2
Agree	36	37.1
Neutral	28	28.9
Disagree	19	19.6
Strongly Disagree	5	5.2
Total	97	100

According to table 4.8 the responses were as follows 7(7.2%) strongly agree that the results could be relied on 36(37.1%) agreed while 28(28.9%) remained neutral, disagree were 19 (19.6%) while 5 with a percentage of 5.2% strongly disagreed .The 28.9 % of the respondents who remained neutral should be an important aspect for the laboratory to work on.

When the respondents were asked whether they would agree that customer monitoring has considerably influenced provision of services at the laboratory, 60(61.85%) respondents out of 97 agreed. JOOTRH handles many patients per day and this could be attributed to their good customer relations and services provision that is making the customers loyal to the institution.

Based on the findings the researcher can conclude that customer satisfaction monitoring does positively influence services provision at the JOOTRH laboratory. There are two indicators that brought out weak results and that is information on new tests done in the laboratory and results reliability. According to (Zehir & Sadikoglu, 2012), customers feedback and its use in the services or process improvement can increase customer satisfaction. When an organization (the laboratory) knows the current and future customers needs expectations and complaints handled on time the organization can invest in profitable areas and when customers expectations are met the services increase. The findings show that there is weakness in areas to do with information / communication this is in line with Institute of medicine of the National Academies (U.S) that communication challenges may result in reduced quality.

4.5 Leadership influence on provision of medical laboratory services

The second objective for the study was to examine the influence of Leadership as a TQM component on services provision in the laboratory. without leadership there would be no guidance in any organization and there are certain attributes that are required for effective leadership in especially sensitive institution like the laboratory In this regard, the respondents were requested to respond on the following questions on leadership; provision of safe environment to work, planning for tasks accomplishment satisfaction with supervision and allocation of responsibilities to complete tasks (delegation). This means that leadership has two dimensions and making a significant contribution to running the business." this emphasis on customer oriented services means that leadership must see other departments in the firm as their

customer groups for whom making continuing improvements in services becomes a way of life (White et al., 2013).

4.5.1 Provision of safe Environment

Laboratory is an area that all manner of samples are tested. For proper services delivery the leadership must offer a safe work environment such that if there is spillage of contaminated samples there is a contingency plan, air flow must be taken care of for people who work and walk in to the laboratory given that some chemicals / reagents may have side effects. When these are not taken care of then, delivery of services provision would not be up to date. With this the researcher wanted to understand whether the respondents agreed with the work environment in the laboratory when they were asked whether they are provided with safe environment for their work. The results are shown in table 4.9.

Table 4.9: Provision of Safe Environment

Response	Frequency	Percentage %
Strongly Agree	15	15.5
Agree	66	68.0
Neutral	12	12.4
Disagree	2	2.1
Strongly Disagree	2	2.1
Total	97	100

According to table 4.9, the responses were, 15(15.5%) strongly agreeing to the work environment, 66(68.0%) agreed, 12(12.4) remained neutral while 2(2.1 %) disagreed and 2 (2.1%) strongly disagreed. From the results the respondents agreed with their work environment at more than 70%. This could be attributed to good leadership’s concern for a safe environment to enable the workers be comfortable while delivering their services at the laboratory and at the institution.

4.5.2 Satisfaction with laboratory supervision

Staff supervision is fundamental to any leadership in any organization, in this study context the researcher wanted to understand what the respondents felt about the supervision in the laboratory; they were asked whether the supervision in the laboratory is perfect. The results are as shown on table 4.10.

Table 4.10: Satisfaction with lab supervision

Response	Frequency	Percentage %
Strongly Agree	8	8.2
Agree	56	57.7
Neutral	17	17.5
Disagree	12	12.4
Strongly Disagree	4	4.1
Total	97	100

Table 4.10 the responses were 8(8.2%) strongly agreed 56(57.7%) agreed, 17(17.5 %) were neutral and 12(12.4%) disagreed. With more than 50% of respondents agreeing to the supervision, the 17.5 % who remained neutral and 12.4% who disagreed with the supervision is a big number that the leadership in the laboratory needs to do work on. There is need for supervision strengthening in the laboratory.

4.5.3 Laboratory Manager Plans for Tasks

Planning is a major component of leadership and therefore the researcher wanted to know if the laboratory leadership plans for tasks accomplishment this is because without planning there is always failure, according to (MacKeelprang et al., 2012), quality planning is positively related to employees performance and social responsibility. With that in mind the respondents were asked

if the laboratory director plans for tasks accomplishment. The responses are as shown on table 4.11.

Table 4.11: Laboratory Manager Plans for Tasks

Response	Frequency	Percentage %
Strongly Agree	6	6.2
Agree	66	68.0
Neutral	14	14.4
Disagree	7	7.2
Strongly Disagree	4	3.0
Total	97	100

Table 4.11 shows that the respondents who strongly agreed that laboratory director plans for tasks accomplishment were 6(6.2%), 66(68.0%) agreed, 14(14.4%) were neutral. 7 (7.2%) disagreed. The results show that that over 70% of respondents agreed there is planning for tasks accomplishment in the laboratory.

When the respondents were asked if in their own opinion they think that leadership in laboratory has influence on services provision in the laboratory 62(64%) respondents out of 97 agreed that it has influence in the provision of services. From the results we can say that leadership must see other departments in the firm as their customer groups for whom making continuing improvements in services becomes a way of life (White et al, 2013).

4.6 Extent to which laboratory staff influence on provision of medical laboratory services

The third objective was to find the extent which employee engagement as a TQM component influence services provision in the laboratory. The participants were requested to respond on the following themes; Decision making Involvement in the laboratory, whether they get rewards for jobs well done and whether the staffs are always challenged with new targets (MacKelprang et al., 2012). If the employees' opinions are taken into account in the development of the

institution’s mission, vision strategy, and objectives of the firm, the employees will support and adopt them and own the processes.

4.6.1 Involvement of laboratory Staff in Decision Making

Involvement of employees in decision making is a sure way of making employees own processes that they are involved in and this makes them understand their contributions and roles. It was important to understand whether the laboratory staffs are always involved in decision making. When respondents they were asked whether they are involved in decision making their responses were as shown in table 4.12.

Table 4.12: Involvement of staff in Decision making

Response	Frequency	Percentage %
Strongly Agree	12	12.4
Agree	53	54.6
Neutral	20	20.6
Disagree	6	6.2
Strongly Disagree	6	6.2
Total	97	100

Table 4.12 shows that 12(12. %), strongly agreed with involvement in decision making, 53(54.6 %) agreed while 20(20.6%) remained neutral. The 20.6 % who remained neutral and the 12.4% who disagreed is a large number that the laboratory director needs to improve on while with over 50% agreed to involvement of laboratory staff in decision making in the laboratory we can conclude that there is involvement in decision making in the laboratory.

4.6.2 Employees challenged with new targets

When employees are fully engaged then that means they are able to develop to their full potential and therefore enhance their ability to work under challenging circumstances such that when they are challenged with new targets they are able to use their own judgment and pull through

successfully. The researcher wanted to understand if the staff had mastered their game such that they can come out of challenges by themselves since laboratory can always present with challenging circumstances. This would also give an insight on how they would handle new tests in challenging situations, when they were asked whether they are challenged with new targets; the responses are shown in table 4.13.

Table 4.13: Challenges with New targets

Response	Frequency	Percentage %
Strongly Agree	13	13.4
Agree	49	50.52
Neutral	24	24.74
Disagree	6	6.19
Strongly Disagree	5	5.15
Total	97	100

Table 4.13 shows that 13(13.4%) strongly agreed they can handle challenges, 49(50.52%) agree, while 6(6.19%) disagreed. 24(24.7%) remained neutral. The results portray that most of the people can handle challenges in the laboratory.

4.6.3 Rewards for jobs well done

Rewards are for motivating staff this could be used by their supervisors to encourage for good work. The researcher wanted to know whether the staff get rewards for jobs well done in the laboratory as this would boost their morale and impact in their activities in handling their customers thus give positive response to provision of services. When the respondents were asked whether they receive rewards for jobs well done, the responses were as shown on table 4.14.

Table 4.14: Rewards for Jobs well done

Response	Frequency	Percentage %
Strongly Agree	9	9.3
Agree	29	29.9
Neutral	33	34.0
Disagree	20	20.61
Strongly Disagree	6	6.19
Total	97	100

Table 4.14 shows 9(9.3%) strongly agreed to getting rewards for jobs well done, 29(29.9%) agreed, 33(34.0%) remained neutral, 20(20.61 %) disagreed while 6(6.19)strongly disagreed to getting rewards. . The majority did not positively agree to get rewards to jobs well done. More than half of the respondents disagreed. This could be attributed to the bureaucratic nature of the public institutions that deny staff some form of a morale booster.

Overall, when the Question was posed to the respondents to say whether staff engagement has positively influenced provision of services 40 (41.23%) of the respondents out of 90 agreed that staff involvement has positively influenced services provision, this was observed as a low rating. This is in line with (Dykbar et al, 2012) who stated that TQM is not for detection of problems but a focus on prevention and should involve everyone for it to be successful.

4.7 Continuous improvement on provision of medical laboratory services

The researcher was concerned with how continuous improvement as a TQM component influence laboratory services provision for both staff and customers. This was the fourth objective and it started off by asking participants questions on whether they attend Trainings, whether they Bench mark and whether the laboratory Address non conformances on time. Continuous quality improvement will ensure that users continue to get quality services.

4.7.1 Attend Regular Trainings

Regular trainings are ways an organization ensures continuous improvement for their staff. With that the employees are able to improve on processes to enable them remain in the job market thus important for services provision. The laboratory staff can only learn of new ways of doing tests through regular trainings therefore the researcher wanted to know whether they attend regular trainings the respondents were asked if they attend regular trainings that include professional developments and their responses are shown in table 4.15.

Table 4.15: Attend Regular Trainings

Response	Frequency	Percentage %
Strong Agree	9	9.3
Agree	50	51.5
Neutral	26	26.8
Disagree	7	7.2
Strong Disagree	5	5.2
Total	97	100

Table 4.15 shows that 9(9.3%) strongly agreed to attendance of regular trainings, 50(51.5%) agreed while 26(26.8%) were neutral, 7(7.2%) disagreed and 5.2 % strongly disagreed. More than 50% of the respondents agreed lab staff attend training. Data shows that 26.8 % remained neutral, the number is big and the leadership needs to improve on that (Aubrey, 2015) believes that continuous training should be a must for every professional.

4.7.2 Addressing non Conformances on an Agreeable time

Tests that are run in the laboratory have agreeable parameters for acceptance. Sometimes laboratories do make errors that can cause fatal results, it is therefore important for labs for proper services provision to always and continuously address their non-conformances to be able to provide services. The study therefore wanted to know whether the JOOTRH laboratory non conformances are addressed on time for them to be able to provide proper services, the

respondents were asked whether the laboratory addresses and determine non conformities and their root causes in good time and the responses were as shown in table 4.16.

Table 4.16: Addressing non Conformances on an Agreeable time

Response	Frequency	Percentage %
Strongly Agree	17	17.5
Agree	49	50.5
Neutral	19	19.6
Disagree	9	9.3
Strong Disagree	3	3.1
Total	70	100

Table 4.16 shows responses as follows; 17(17.5%) strongly agreed that the non-conformances are addressed on time, 49(50.5%) agreed 19(19.6%) were neutral. 9(9.3%) disagreed while 3.1% strongly disagreed. From the results it is significant to note that more than 60% of participants acknowledged that non conformances are addressed in good time.

4.7.3 Bench Marking

Bench marking is important for any organization that believes in continuous improvement, the researcher was interested in what the customers and staff would say about the JOOTRH laboratory bench marking with other labs as this would show where they are and where they would want to go and to prove that they are at par with the rest to remain relevant in offering medical laboratory services. The respondents were asked whether the laboratory bench marks with other laboratories and they responded as shown below on table 4.17.

Table 4.17: Bench Marking

Response	Frequency	Percentage
Strongly Agree	12	12.4
Agree	57	58.8
Neutral	18	18.6
Disagree	10	10.2
Strong Disagree	0	0.00
Total	97	100

Table 4.17 results show that 12(12.4%) strongly agreed that they do bench marking, 57(58.8%) agreed while 18(18.6%) remained neutral while 10.2% disagreed with bench marking.. In overall, more than 50% of respondents agreed to bench marking in the laboratory as this would boost their standard in provision of services.

When the respondents were asked if continuous improvement has positively influenced provision of services at the JOOTRH laboratory 51(52.57%) of 970 respondents strongly agreed that continuous improvement has a positive influence on services provision. From the results we can relate the findings to (Dybkaer et al., 2012) who believes that continuous improvement is a central principle of TQM and that mistakes maybe made by people but most of them are caused or permitted by faulty systems and processes, this means that root cause of such mistakes can be identified and eliminated and repetition can be prevented by changing processes continuously. Continuous quality improvement ensures that medical laboratory services continue to meet the expectations of services users and are developed with their end needs in mind.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of major findings as deduced by the study, it also presents Conclusions, Discussion, Recommendations and areas of further research for both policy and contribution to the body of knowledge.

5.2 Summary of Findings

The study had five major objectives namely; To determine how customer satisfaction monitoring, as a component of TQM, influence provision of medical laboratory services the second objective was to examine how leadership as a component of TQM influence provision of medical laboratory services the third was to assess the extent to which laboratory staff engagement as a component of TQM influence provision of medical laboratory services the fourth objective was to determine the level at which continuous improvement as a component of TQM affect provision of medical laboratory services.

The research sought to establish the influence of customer satisfaction monitoring by use of key indicators such as feedback time on receiving laboratory results, prompt update of tests done in the laboratory, results reliability and staff professionalism in the JOOTRH laboratory. Findings of the study showed that those who strongly agreed with Feedback time on lab results were 10.3% agreed were 63.9%, those who remained neutral were 17.5%. Those who strongly agreed with timely information on new tests were 4.1%, those who agreed were 49.5% while 28.9% disagreed. Those who strongly agreed with Professionalism in the lab were 14.4%, agreed were 57.7% while neutral were 22.7%. Those who strongly agreed with Reliability of results were 7.2%, agreed were 37.1%, neutral were 28.9% and disagree were 19.6%. The overall response was 61.81%. The results show that Customer satisfaction monitoring has influence on provision of services at the hospital laboratory however areas of communication need strengthening as this would impact on the services. Challenges in communication may result to increased use of expensive diagnostic tests.

The study also sought to establish if leadership had influence on provision of medical laboratory services by studying the following variables, provision for safe environment, if the supervision

was adequate and by finding out if the leader plans and allocates duties. Laboratory Director provides safe work environment had 15.5% strongly agreed, 68% agreed, and 12.4% remained neutral. Satisfied with Lab Director Supervision 8.2% strongly agreed with the supervision, 57.7% agreed, 17.5% remained neutral while 12.4% disagreed. Lab Director planning for tasks had 6.2 strongly agreed with the planning, 68% agreed with the planning, 14.4% remained neutral while 7.2% disagreed. 64% agreed that there is influence of leadership in the provision services. Supervision in any organization is a sensitive matter and the study points out that there are those 17% and 12.4% of the respondents who remained neutral and disagreed respectively that cannot be ignored. The laboratory manager needs to strengthen the system in order for supervision to improve. This concurred with (Angote, 2000) who stated that highly skilled administrators are critical to producing high-quality outcomes and effective quality improvement. Moreover, organizations with higher leadership competencies produce products and services of higher quality.

On influence of laboratory staff engagement on provision of medical laboratory services the following variables were studied, Involvement of laboratory staff on decision making, challenging the employees with new targets, rewards for jobs well done was studied too. The findings were as follows, those who strongly agreed with Involvement in decision Making were 12.4%, 54.6% were in agreement, 20.6% were neutral, 6.2 % disagreed while another 6.2% strongly disagreed with involvement in decision making. Those who strongly agreed with challenge with new targets were 13.4%, agree were 50.52% while neutral and strongly disagree were 24.746.19% respectively. On rewards for jobs well done, 9.3% strongly agreed, 29.9% agreed, 34% remained neutral, 20.61% disagreed while 6.19% strongly disagreed. 41.23% of the respondents agreed that there is influence of staff involvement in the provision of services however the results indicate reward as weak in the laboratory system. The respondents who remained neutral and disagreed make over 50% showing a need for improvement as It has been found that engaged employees work harder, are more loyal and are more likely to go the 'extra mile' for the corporation. In addition, Organizations should utilize all employees' skill and abilities to gain business services provision to the fullest (Talib, 2013). Such behavior help customers who are both internal and external to differentiate a gratifying services experience from a dissatisfactory one.

The fourth objective was to establish if continuous improvement had influence on provision of medical laboratory services, the following objectives were studied; Attend Regular trainings addressing of non conformances on time and bench marking. Those who strongly agreed to attendance of regular trainings were 9.3%. 51.5% agreed to regular trainings, 26.8% remained neutral while 7.2% disagreed. On addressing non conformances on time 17.5% strongly agreed, 50.5 agreed, 19.6% remained neutral while 9.3% disagreed. On Bench marking, 12.4% strongly agreed, 58.8% agreed, 18.6% remained neutral while 10.2%. 57% agreed that there is influence of continuous improvement on provision of services. Training needs to be strengthened for the system to remain strong. Continuous quality improvement ensures that medical laboratory services continue to meet the expectations of services users and that they are developed with their end needs in mind. A commitment to horizon scanning helps to predict developments and trends and consider the factors that can influence outcome in these processes which in the end would be beneficial to the customer. The researcher concluded that there is influence of TQM at the JOOTRH but there are areas that need strengthening to build a stronger system within the hospital laboratory.

5.3 Conclusions

From the present research findings there is sufficient evidence that the TQM components have influenced provision of services at JOOTRH laboratory and of importance it would be good to note that JOOTRH is a Public facility that is run by Central Government and county Government policies that may have contributed greatly to the results.

Concerning customer satisfaction monitoring; timely information on new tests and reliability of results needs improvement. Nonetheless, it was a significant factor influencing services provision at the JOOTRH laboratory.

On leadership influence as a TQM component on services provision at JOOTRH laboratory, laboratory director supervision scored low, followed by laboratory plans for tasks, without proper planning the laboratory may not achieve much therefore improvements is required in the two areas.

On laboratory staff engagement as a TQM component on provision of services at JOOTRH Laboratory, getting rewards for jobs well done had a low score compared to the others meaning that some improvement is required.

Based on results continuous improvement as a TQM component on provision of services at JOOTRH laboratory was noted significantly however, attending regular trainings needs to be improved on for the staff to sharpen their skills.

5.4 Recommendations

Based on the findings of the study, the researcher makes the following recommendations

1. To get quality services provision from a public health laboratory the Government should pay attention to the needs of the Public laboratories in referral hospitals customers and put in their policy ways and means of communicating effectively both with internal customers and external customers for the laboratories to work optimally in providing medical services..
2. There should be a Government policy on how and when to reward staff for work well done to boost their morale.
3. Public health laboratories should be allowed to bench mark with private laboratories to gauge where they are in terms of quality and this could be a better source of training for the laboratory staff.

5.5 Suggestions for further research

1. The study did not explore certain areas that were equally important. Such areas were left out because they were beyond the scope and limitations of this study and due to limitation of time and resources.
2. Drawing from the findings of the study, it is recommended that an in depth study be done on the reward system of public laboratory staff to find out issues surrounding the discomfort in the area. In the current study this was not possible as this study had limited time.
3. Based on the results it is also recommended that more research should be done to assess the differences in TQM practices at government owned laboratories and private laboratories affects services provision.

4. From the study the researcher recommends a study to be done on how dissemination of information be it new tests or any item that customers need to know should be communicated effectively.

5.6 Contribution to the body of knowledge

Drawing from the study findings and building on the existing research more studies should be carried out to address the following Replication of the study with emphasis on qualitative data gathering techniques such as observations and focus group discussions given that the current study mainly used questionnaires. Using such an approach would help come up with more comprehensive information / data to understand why public health medical laboratory is not able to fully Utilize TQM in their facilities to support in services provision.

Table 5.1: Contribution to the body of knowledge

Objective	Recommendation
To determine how customer satisfaction monitoring, influence provision of medical laboratory services at JOOTRH	The study found out that the laboratory does not give timely information on new tests. This would affect services provision since it should be customers first. The laboratory should Endeavour to give information being done in the laboratory.
To examine how leadership influence provision of medical laboratory services at JOOTRH.	The study noted that supervision was an issue in the medical laboratory. The study recommends supervision skills to be improved at the laboratory.
To assess the extent to which laboratory staff engagement influence provision of medical laboratory services at JOOTRH	The study established that there is an issue with reward for staff. The study therefore recommends that the management together with the ministry look in to reward issues at this hospital laboratory.
To determine the level at which continuous improvement influence provision of medical laboratory services at JOOTRH	The study recommends more bench marking for the lab.

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APPENDICES

Appendix 1: Letter of Transmittal

LETTER OF TRANSMITTAL

UNIVERSITY OF NAIROBI

P.O BOX 30197 – 00100

NAIROBI – KENYA

15 JAN 2016

TO

**RE: INFLUENCE OF TOTAL QUALITY MANAGEMENT ON MEDICAL
LABORATORY SERVICES:**

**A CASE OF THE MEDICAL LABORATORY AT JOOTRH HOSPITAL KISUMU-
KENYA**

I am currently a student pursuing a Masters of Arts Degree in Project Planning and Management at the University of Nairobi. I am carrying out the above study in JOOTRH – Kisumu as part of the requirement for the fulfillment of Masters of Arts Degree. The purpose of this letter is to request your participation in the study.

All information collected will be treated as strictly confidential.

Your cooperation and support in this study will be highly appreciated.

Yours faithfully,

Elizabeth A. Ayuo.

Appendix 2: Questionnaire

INTRODUCTION:

I am student at University of Nairobi pursuing a master's degree in Project Planning and Management. Currently I am carrying out the above study in the JOOTRH laboratory as part of the requirement for the fulfillment of my master's degree.

The purpose of this introduction is to kindly request you to participate in the study by completing the attached questionnaires. All the information collected will be treated as strictly confidential.

Your co-operation and support in this study will be highly appreciated.

INSTRUCTIONS:

1. **Tick** one option only
2. As a staff of the laboratory at JOOTRH I am requesting you to fill all the sections (**A, B, C, D E**) appropriately. All information given will be treated with strict confidence.

SECTION A: DEMOGRAPHIC CHARACTERISTICS)

Respondents age (years)_____ (18- 65 years)

Respondents Gender: Male Female

Respondents Education level: Certificate Diploma Bachelor Masters Phd

RESPONSE	Strongly Agree	Agree	In different	Disagree	Strongly disagree
SECTION B : CUSTOMER					

SATISFACTION monitoring and provision of lab services					
Are you always satisfied with the time taken by the lab to give me feedback on lab requests					
Do you agree that Lab technicians keep informing you of available new tests in the lab regularly,					
Do you agree with reliability of results from the lab					
Do you agree with professionalism in the laboratory					
Customer satisfaction monitoring has considerably influenced customer satisfaction in services provision					
Section c: leadership and provision of lab services	Strongly agree	Agree	Indifferent	Disagree	Strongly disagree
Does your lab manager provide a safe environment that enables you do work					
The lab manager supervision is perfect					
Lab director plans for the tasks to be accomplished in the right time					

In your own opinion leadership has positively influenced services provision in the laboratory at JOOTRH					
---	--	--	--	--	--

Section D: laboratory staff Engagement and provision of lab services?	Strongly agree	Agree	Indifferent	Disagree	Strongly disagree
Staff are involved in decision making in the lab					
staff get rewarded for a job well done					
Manager challenges me with new targets					
Laboratory staff engagement has positively influenced provision of lab services					
Section E: Continuous improvement and laboratory services provision services	Strongly agree	Agree	Indifferent	Disagree	Strongly disagree
Do you attend regular trainings including professional development programmes that are organized by professional laboratory organizations					
The lab reviews data and information to determine potential non conformities and their root causes and ways of solving them					
The lab Bench marks with other labs					
If Continuous improvement has positively influenced provision of lab services at JOOTRH ?					

Appendix 3: Table for Determining Sample Size from a Given Population

<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size.

S is sample size.

Appendix 4: Jaramogi Oginga Odinga Teaching and Referral Hospital Approval



MINISTRY OF HEALTH

Telegrams: "MEDICAL", Kisumu
Telephone: 057-2020801/2020803/2020321
Fax: 057-2024337
E-mail: ercjootrh@gmail.com
When replying please quote

**JARAMOGI OGINGA ODINGA TEACHING &
REFERRAL HOSPITAL**
P.O. BOX 849
KISUMU

13th May, 2015

Date

ERC.IB/VOL.I/256

Ref:

Elizabeth A. Ayuo,
UNIVERSITY OF NAIROBI – KISUMU CAMPUS

Dear Elizabeth,

RE: FORMAL APPROVAL TO CONDUCT RESEARCH ENTITLED: "INFLUENCE OF TOTAL QUALITY MANAGEMENT ON MEDICAL LABORATORY SERVICE PROVISION: A CASE OF THE MEDICAL LABORATORY AT JOOTRH HOSPITAL, KISUMU - KENYA"

The JOOTRH ERC (ACCREDITATION NO. 01713) has reviewed your protocol and found it ethically satisfactory. You are therefore, permitted to commence your study immediately. Note that this approval is granted for a period of one year (13th May, 2016 to 13th May, 2017). If it is necessary to proceed with this research beyond the approved period, you will be required to apply for further extension to the committee.

Also note that you will be required to notify the committee of any protocol amendment(s), serious or unexpected outcomes related to the conduct of the study or termination for any reason.

Finally, note that you will also be required to share the findings of the study in both hard and soft copies upon completion.

The JOOTRH ERC takes this opportunity to thank you for choosing the institution and wishes you the best in your endeavours.

Yours sincerely,

WILBRODA N. MAKUNDA
For: **SECRETARY - ERC,**
JOOTRH – KISUMU.

Appendix 5: University of Nairobi Introduction Letter



UNIVERSITY OF NAIROBI
COLLEGE OF EDUCATION AND EXTERNAL STUDIES
SCHOOL OF CONTINUING AND DISTANCE EDUCATION
KISUMU CAMPUS

The Secretary
National Council for Science and Technology
P.O Box 30623-00100
NAIROBI, KENYA

17th March, 2016

Dear Sir/Madam,

RE: AYUO ELIZABETH ATIENO- REG NO: L50/76149/2014


This is to inform you that **Ayuo Elizabeth Atieno** named above is a student in the University of Nairobi, College of Education and External Studies, School of Continuing and Distance Education, Kisumu Campus.

The purpose of this letter is to inform you that **Elizabeth** has successfully completed her Masters Course work and Examinations in the programme, has developed a Research Proposal and submitted before the School Board of Examiners which he successfully defended and made corrections as required by the School Board of Examiners.

The research title approved by the School Board of Examiners is: ***"Influence of Total Quality Management on Medical Laboratory Service Provision: A Case of the Medical Laboratory at JOOTRH, Kisumu-Kenya"***. The Project is part of the pre-requisite of the course and therefore, we would appreciate if the student is issued with a research permit to enable her collect data and write a report. Research project reflect integration of practice and demonstrate writing skills and publishing ability. It also demonstrates the learners' readiness to advance knowledge and practice in the world of business.

We hope to receive positive response so that the student can move to the field to collect data as soon as he gets the permit.

Yours Faithfully


Dr. Raphael O. Nyonje, PhD
SENIOR LECTURER & RESIDENT LECTURER
DEPARTMENT OF EXTRA-MURAL STUDIES
KISUMU CAMPUS



Appendix 6: NACOSTI Approval



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349,3310571,2219420
Fax: +254-20-318245,318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
when replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No.

NACOSTI/P/16/24952/10324

Date:

17th June, 2016

Elizabeth Atieno Ayuo
University of Nairobi
P.O. Box 30197-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *“Influence of total quality management on medical laboratory service provision, a case of the medical laboratory at Jaramogi Oginga Odinga Teaching and Referral Hospital in Kisumu Kenya,”* I am pleased to inform you that you have been authorized to undertake research in **Kisumu County** for the period ending **13th June, 2017.**

You are advised to report to **the Chief Executive Officer, Jaramogi Oginga Odinga Teaching and Referral Hospital, the County Commissioner and the County Director of Education, Kisumu County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

DR. STEPHEN K. KIBIRU, PhD.
FOR: DIRECTOR-GENERAL/CEO

Copy to:


The Chief Executive Officer
Jaramogi Oginga Odinga Teaching and Referral Hospital.

The County Commissioner
Kisumu County.

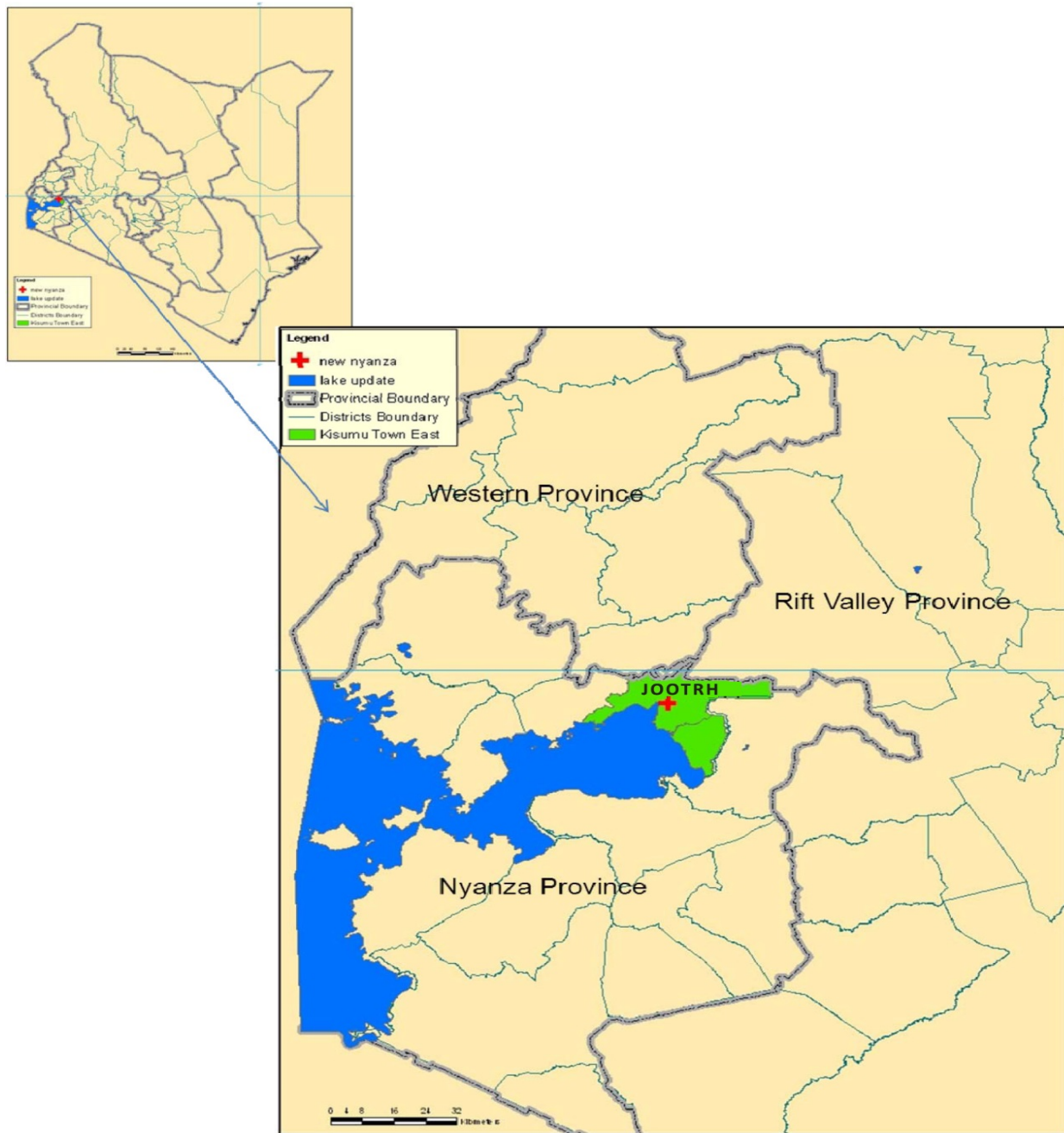
Appendix 7: Picture

THIS IS TO CERTIFY THAT: **Permit No. : NACOSTI/P/16/24952/10324**
MS. ELIZABETH ATIENO AYUO **Date Of Issue : 17th June, 2016**
of NAIROBI UNIVERSITY SCHOOL OF **Fee Received : ksh 1000**
CONTINUING AND DISTANCE
EDUCATION, 1578-40100 Kisumu, has
been permitted to conduct research in
Kisumu County
on the topic: INFLUENCE OF TOTAL
QUALITY MANAGEMENT ON MEDICAL
LABORATORY SERVICE PROVISION AT
CASE OF THE MEDICAL LABORATORY AT
JARAMOGI OGINGA ODINGA TEACHING
AND REFERRAL HOSPITAL IN KISUMU
KENYA
for the period ending:
13th June, 2017

Applicant's Signature **Director General**
National Commission for Science, Technology & Innovation



Appendix 8: Map of study Area



Source: Google maps